BROWN'S CREEK WATERSHED DISTRICT
2009 ANNUAL REPORT
May 2010

Prepared by:
Brown's Creek Watershed District Board of Managers
Craig Leiser, President
Rick Vanzwol, Vice-President
Gail Pundsack, Vice-President
Connie Taillon, Treasurer
Gerald Johnson, Secretary

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2009 Brown's Creek Watershed District Annual Report

Cover Photo: Blooming Blood Root and the Historic Brown's Creek Stone Foot Bridge
Photo Credit: Karen Kill, BCWD Administrator

1. Introduction

The Brown's Creek Watershed District was established by order of the Board of Water and Soil Resources (BWSR) of the State of Minnesota under statutory authority in October of 1997. The Watershed District was formed following the dissolution of the Brown's Creek Watershed Management Organization (BCWMO), a joint powers agency. A board of five managers were initially appointed by the BWSR and subsequently re-appointed by the Washington County commissioners. From the appointed board of managers the positions of President, Vice-President, Treasurer, and Secretary was elected. In one of its first actions, the newly selected board adopted the Watershed Management Plan that had been developed by its predecessor: the BCWMO. This action included two flood relief capital improvement amendments.

Since its inception, the Brown's Creek Watershed District Board has been committed to the two primary objectives of any watershed: preservation of water quality, and, reduction of risk to property owners due to flooding. The initial challenge was directed solely at surface water, but later events have focused increasing attention on the groundwater resources of the Watershed District as well. The Watershed board has also been active in attempting to integrate its plans and actions with various interests in land use and development of the governmental units within the boundaries of the Watershed.

2. Organization and Budget

a. Brown's Creek Watershed District – Board of Managers & Staff

BROWN'S CREEK WATERSHED DISTRICT - 2009 BOARD OF MANAGERS

Manager/ Address	**Position**	**Term Expires**	**Community Liaison**
Craig Leiser 10300 Kismet Lane Stillwater, MN 55082	President	10/22/10	Grant
Rick Vanzwol 9750 Jamaca Avenue North Grant, MN 55115	Vice-President/ CAC Liaison	10/22/12	Stillwater Township
Connie Taillon 3374 Staples Pl Stillwater, MN 55082	Treasurer	10/22/11	Oak Park Heights Lake Elmo
Gerald Johnson 302 Edgewood Avenue Stillwater, MN 55082	Secretary	10/22/12	City of Stillwater
Gail Pundsack 140 Northland Avenue Stillwater, MN 55082	Vice-President	10/22/10	Hugo May Township

The BCWD does not have any employees. The BCWD does contract with several organizations for professional services. In January 2007, the BCWD solicited proposals for engineering and legal services. At that time the firms of Emmons Olivier Resources, Inc. and Smith Partners P.L.L.P. were retained for engineering and legal services respectively. The following is a list of all contract support staff utilized by the BCWD in 2009.

BROWN'S CREEK WATERSHED DISTRICT CONTRACT SUPPORT STAFF

Administrator	**Attorney**	**Engineer**	**Recording Secretary**
Karen Kill Washington Conservation District 1380 West Frontage Rd, Hwy 36 Stillwater, MN 55082 651.275.1136 x26 karen.kill@mnwcd.org	Chuck Holtman/Louis Smith Smith Partners, P.L.L.P. Old Republic Title Building 400 Second Avenue South, Suite 1200 Minneapolis, MN 55401 612.344.1400 smith@smithpartners.com holtman@smithpartners.com	Camilla Correll, P.E. Emmons Olivier Resources, Inc. 651 Hale Avenue Oakdale, MN 55128 651.770.8448 ccorell@eorinc.com	Debbie Meister (2009)

b. District Information

The Brown's Creek Watershed District (BCWD) is the governmental unit with primary responsibility for protecting the water resources of the Brown's Creek Watershed. The District was established in 1997 under the Minnesota Watershed District Act.

The District covers approximately 18,000 acres that drain into Brown's Creek, which then enters the St. Croix River. The watershed includes Brown's Creek—a DNR designated trout stream, and several small tributaries. The watershed includes twelve major lakes and numerous wetlands. The District includes portions of the Cities of Oak Park Heights, Grant, Hugo, Lake Elmo, and Stillwater along with portions of May and Stillwater Townships. The upper portion of the District is largely rural with farms, large-lot development and undeveloped grassland, cropland and forestland dominant. The lower portion of the District includes rapidly developing urban areas within the Cities of Stillwater and Oak Park Heights.

As a part of the Third Generation Management Plan development, the BCWD Board of Managers adopted a vision statement and a mission statement, which were developed with input from the Citizens Advisory Committee and the Technical Advisory Committee.

Vision Statement

The Brown's Creek Watershed District is made up of communities interlaced with natural corridors. These natural corridors improve the function and value of the District's water resources and support a diverse population of plants, wildlife, and fish. The District brings people and the environment together to accommodate development that preserves the

connection between surface water and groundwater and enhances the quality of these resources.

Mission Statement

The Brown's Creek Watershed District works with the community to:

- Preserve and improve the quality of the District's water and natural resources;
- Educate residents about the value of this ecosystem and advise residents of their potential impacts on the functions and values of the District's water and natural resources;
- Find and implement acceptable solutions to water-related issues; and
- Assure that the integrity of the watershed is preserved for future generations.

c. Audit Report

The audit of financial management of the District for January 1-December 31, 2009 was performed by the firm of HLB Tautges Redpath, Ltd. This audit revealed that in all material respects, the respective financial position of the governmental activities, each major fund and the aggregate remaining fund information of the Brown's Creek Watershed District, as of December 31, 2009, and the respective changes in financial position for the year ended in conformity with accounting principals generally accepted in the United States of America. A full copy of the 2009 audit is enclosed in Appendix A.

d. Citizens Advisory Committee

A list of the appointed Citizen's Advisory Committee members are as follows:

First Name	Last Name	Address	City/State/Zip	Community
David	Korte	3515 Pine Hallow Place	Stillwater, MN 55082	Stillwater
Tom	Henderson	1206 Eagle Ridge Trail	Stillwater, MN 55082	Stillwater
Sharon	Schwartz	9923 110th St N	Stillwater, MN 55082	Grant
Don	Peterson	7130 Mid Oaks Ave N	Stillwater, MN 55082	Stillwater
Paul	Richtman	2854 Nightengale Court	Stillwater, MN 55082	Stillwater
Karen	Richtman	2854 Nightengale Court	Stillwater, MN 55082	Stillwater
Paul	Spilselth	1421 4th Street N	Stillwater, MN 55082	Stillwater
Luanne	Fogelson	9850 103rd St N	Stillwater, MN 55082	Grant
Marvin	Jones	11730 Dellwood Rd N	Stillwater, MN 55082	Grant
Melissa	Lewis	10799 105th St N	Stillwater, MN 55082	Grant
Don	McKenzie	12670 72nd St N	Stillwater, MN 55082	Stillwater
Joe	Ardnt	3383 Pioneer Pl	Stillwater, MN 55082	Stillwater
Ed	Lowell	1165 Nightingale Blvd	Stillwater, MN 55082	Stillwater
Debbra	House	P.O. Box 13	Stillwater, MN 55082	Stillwater

The CAC opted not to elect officers. The District CAC met September 10, 2009.

e. Final 2009 & Approved 2010 BCWD Budget

See attached Final 2009 and Approved 2010 Budgets

3. Projects and Programs – 2009 Activities and 2010 Goals

a. Capital Improvement Projects: Two capital improvement projects were incorporated into the BCWMO management plan adopted by the BCWD in 1997. These were the mitigation of periodic flooding in the School Section/Goggins/Plaisted Lake basin, and, a similar though smaller project in the Kismet basin. A third capital improvement project was added in 2005; this was the design and financial assistance towards the construction of the Kern Center Pond expansion in Oak Park Heights. A fourth capital improvement project was added in 2007 to improve water quality in Long Lake in the City of Stillwater.

1) Trout Habitat Preservation Project

Design and construction of the Goggins/School Section/Plaisted Lake project was initiated in 1999 and completed in 2001. This project was not merely a "drainage" project. Rather, it became known as the Trout Habitat Preservation Project (THPP) owing to the fact that it focused on protection and enhancements of the sensitive spring-fed headwaters of Brown's Creek, as well as stabilization of water levels in the landlocked basin of the lakes. In operation, overflow from the lakes flows through a system of wetlands and into an infiltration basin that provides significant groundwater recharge into the headwater springs from which Brown's Creek rises. This project was continued to be monitored in accordance with the Operation & Maintenance Plan.

In 2004, the District resolved a flowage easement issue with a downstream landowner by purchasing flowage rights across the property through a flowage agreement recorded with the Washington County Recorders Office. After continued project monitoring, the District felt as though the project has proven effective. The District applied for and won the Minnesota Association of Watershed District's 2004 project of the year award for the Trout Habitat Preservation Project.

In 2005, the BCWD Board authorized analysis to determine how to recover infiltration rates in one of the basins that was showing signs of some reduction as a part of the on-going maintenance of the project. Infiltration recovery project designed in winter 2006 and was installed in January 2007.

The infiltration recovery project was monitored in 2007-2008. It was found to be an effective means of regaining acceptable infiltration rates. A dirt field road was determined to be a source of fine sediment to one of the infiltration practices. Culverts and catch basins leading to the practices were cleaned and the field road was rocked in 2008.

2009 & 2010 Activities – Continued infiltration monitoring, necessary maintenance activities and report.

2) Kismet Basin

The second project was the Kismet Basin project. After extensive negotiation with affected landowners, consideration of several alternate designs, each with varying degrees of drainage and infiltration, a final design was selected and the project ordered in 2001. The project called for selection of a contractor and completion of most of the earth moving and heavy equipment phase in late 2001. Planting and landscape alterations took place in early 2002. This project also has residual monitoring and review by the BCWD into the future.

3) Kern Center Pond Expansion

In 2001, the BCWD was awarded $25,000 from the Minnesota Board of Water and Soil Resources' (BWSR) Local Water Planning Challenge Grant Program. The objective of the project *BCWD Rules Implementation — Demonstration Site Plan* was to develop a demonstration site for the education of member communities, developers and citizens regarding the environmental controls and stormwater management standards required by the District's rules.

By 2002, the BCWD had identified the Kern Center Pond as a potential demonstration site for the District's rules. In order to ensure that future development within the Kern Center Commercial Area would meet the District's standards, and that peak flow rates and volumes under Hwy 36 were reduced, the BCWD offered to design the modifications that would achieve these goals. Since that decision as made, the BCWD and the City of Oak Park Heights have collaborated on the following: development of a Cooperative Agreement; design of the pond modifications; development of an Operation and Maintenance Plan; development of a Monitoring Plan; the construction process.

The construction of the Kern Center Pond modifications began in December of 2004. Final excavation and restoration of the site was completed in the spring of 2005. The goals of the modifications to the Kern Center Pond were: increased storage capacity; pretreatment of stormwater runoff; increased infiltration; and improved wildlife habitat. Continued monitoring of the infiltration basin at the Kern Center determined that the pond was not effectively infiltrating. A study was completed to determine the source of the issue. Sediment cores were taken. The problem was neither clogging nor presence of a confining layer. It appears that the pond has become connected with a perched groundwater system. The Board has budgeted for a study of the Kern Center drainage area to determine areas for volume control retrofits.

2009 & 2010 Activities: In 2009, the District determined some ideas of volume control retrofits and met with the City of Oak Park Heights to discuss the performance of the Kern Center Pond. Outflows from the entire subwatershed is far less than the model predicts. Before volume retrofits are implemented, actual outflow information will be collected in 2010.

4) Long Lake Management Plan Implementation

The District developed the Long Lake Strategic Lake Management Plan to reduce total phosphorus by 35% from the subwatershed loading. This plan was developed with the guidance of a stakeholders group and a citizen task force made up of residents in the subwatershed. The District approved the plan in May 2006 began implementation, utilizing a 2006-07 Board of Water and Soil Resources Challenge Grant to fund $75,000 of the implementation and is actively working towards obtaining additional grant funding. The total cost over 10 years will be approximately $1.2 million to fully implement the subwatershed loading reductions from the Long Lake Management Plan.

In 2006, the District began a BMP cost-share program. Projects proposed in the Long Lake subwatersheds, particularly the direct drainage areas, are given higher ranking. This program has been continued annually. In 2010, the District will be doing a subwatershed assessment to further refine the targeted priority areas to determine the most cost-effective locations for BMP projects.

In 2007, the District designed and installed two implementation projects. The North Marketplace pond improvements to the Cottage Pond and Wildwood pond will reduce the amount of total phosphorous loading to Long Lake by a total of 11 pounds per year. The total cost of these improvements were $57,250 for a cost of $5,204.55 per pound of total phosphorous removed.

In 2007, the Tower Drive Pond Improvement was implemented in collaboration with the City of Stillwater for an additional 4 pounds per year reduction in total phosphorous to Long Lake. The installation was less than $200.

In 2007, the District designed and executed the Herberger's Pond improvement. The project is projected to reduce the annual total phosphorous load to Long Lake by 35 pounds. The total cost of the project was $120,064 and calculates to a cost of $3,440.40 per pound of total phosphorous removed. The project uses a device to filter dissolved phosphorous from small storm events or the first flush of larger events. In 2009, the District finalized improvements to Herberger's Pond EcoStormPlus and began monitoring to determine its performance. Additional filtering vegetation was planted with District volunteers to help eliminate algae from clogging the filter.

In 2009, the District worked with Washington County HRA to retrofit its facility at Ann Brodlovich site in Marketplace area in Stillwater, MN. This project had the opportunity to reduce P loads to Long Lake by 3.4 lbs/year. The District agreed to a $15,000 cost-share on the project including raingardens along a back swale and parking lot retrofits. The majority of the project was completed in 2009. The parking lot retrofits are scheduled for 2010.

The District partnered with the Washington Conservation District and Middle St. Croix WMO for a Stormwater Audit program to inform residents of overall

property stormwater impacts. Long Lake residents in Croixwood all received the opportunity to participate.

The District received a BWSR Native Buffer Grant to restore a 25 foot native buffer implementation along east shoreline on City of Stillwater parkland. The reed canary grass removal began October 2009 and will be treated at least a second time in fall 2010. The buckthorn removal will begin fall 2010. Replanting with native vegetation will occur in 2011.

The Long Lake Management Plan also discusses management options to address internal phosphorous loading, which can often be a significant source of nutrients in a shallow lake. In January 2008, the BCWD Board authorized the District Engineer to complete a feasibility study on whether a temporary lake draw down is 1) hydrologically possible on Long Lake (could it be pumped, how long to refill, etc) and 2) what benefits would be seen. Some of the benefits that others have seen in other shallow lakes or wetlands is a reduction in exotic aquatic vegetation (not applicable to Long Lake), rough fish kill with ability to restock top down predator fishery, increase in emergent vegetation (shoreline plants), consolidation of flocculent sediments, increase in diversity of aquatic vegetation, reduction in nutrients, reduction in algae (scum/green color of water), increase in rooted aquatic vegetation. This study was completed in 2009 and concluded that a full lake draw down would not be recommended on Long Lake. The District also analyzed the impacts of motors on lake mixing and the extent of sediment deltas at the inlets to Long Lake. The District will determine whether sediment delta removal should be completed with District taxpayer funding in 2010.

The DNR gave a positive confirmation of Eurasian Water Milfoil (EWM) in the north end of Long Lake in 2009. A lake vegetation survey was conducted of both Long Lake and Jackson WMA to determine the extent of the EWM.

Long Lake residents were informed of all 2009 Long Lake activities in a newsletter requesting further input on previous studies and proposed management activities.

The District cost-shared a culvert retrofit in 2009 with the City of Stillwater to alleviate a potential future flooding problem for a resident on the south side of Long Lake. The landowner's driveway could have been flooded for more than two days during a 100-year flood event, making the property inaccessible during that time.

b. Rules and Permits: In accordance with statutory authority, the BCWD has developed "Rules" which derive from the management plan and are directed at providing consistent evaluation and approval for development of land, modifications in land usage, and preservation of natural resources as they relate to water management. These rules apply to volume and rate of water movement, buffers adjacent to water resources, shoreline/streambank modifications, stream and lake crossings, floodplain delineation

and erosion control in instances of significant surface construction. Private parties, developers, and governmental agencies are required to submit plans and calculations to show how the proposed activity will be managed to comply with the rules. The process results in the issuance of a permit, which also directs certain measurement and enforcement activities to insure compliance. The District adopted the new rules effective May 1, 2007. BCWD continued a Digital Inspection Program and Seasonal Permit Inspector in 2009. The inspector has been effective in gaining compliance on the sites. As the economy has declined, so have the number of new permits. Of the ten permits in 2009, most were pertaining to road reconstruction projects.

Groundwater Dependent Natural Resource Protection –Finalize the Fen GWDNR Comprehensive Management Plan in 2010 and incorporate into District Rules. The District will work with the landowner in 2010 to determine was additional management options may be implemented to provide additional protection/restoration for the fen.

c. Hydraulic and Hydrologic Study Phase II: The Brown's Creek Watershed District has invested approximately $80.000 to develop a very exact Hydraulic and Hydrological study of the district watershed and sub-watersheds. The study incorporates the two-foot contour mapping, GIS location, a natural resources inventory, the North Washington Groundwater Study and an extensive update to the computerized modeling (XP-SWMM) necessary to manage the water resources of the District's lakes, ponds, wetlands, streams and Brown's Creek. This study was completed in 2004 and is being used as a tool to evaluate and permit building sites, developments, conditional use permits or other projects that directly or indirectly affect the quality and quantity of the District's water resources. This information was also used to assist Washington County in assessing floodplains for a FEMA map update of the county. The hydrologic information is also available through a GIS tool developed in 2004. The GIS tool is an easy interface to access District geospatial information, such as the 100-year high water levels for each delineated subwatershed in the District. After such a significant investment, the District has made it a priority to budget an annual fund to update the model as new studies are conducted and more detailed information is available.

d. Water Monitoring and Education Program: The BCWD supported several education and monitoring projects during the year to develop a profile of healthy watershed system so as to support its management of rules and permits. Continued the baseline-monitoring program, which includes macroinvertebrate monitoring, conducting water quality and flow monitoring in Brown's Creek and monitoring the water quality and level of the District's lakes. The baseline monitoring program will be continued in 2010 to prepare for future lake management plans and TMDL studies; monitor effectiveness of capital improvement projects; and use collected data to develop better management strategies.

The District continued its participation in the Volunteer Stream monitoring program; three area high school groups get the opportunity to do real science and the District gets quality-controlled data. . The monitoring projects are done in conjunction with the

Metropolitan Council's Water Outlet Monitoring Program (WOMP) and the Citizen Assisted Monitoring Program (CAMP).

The District sponsored three high school teams within the District to participate in the annual Envirothon competition.

The District continued to provide education of residents through the District website and also dedicated funding for the next three years for a shared stormwater educator position. Activities included "Blue Thumb House Parties," Blue Thumb presentations to HOA's, and Stormwater U trainings. BCWD continued the best management practices cost-share program as a method to educate District residents regarding methods to improve water quality.

The District began participating in a partnership to fund a shared stormwater educator position. This position was filled in July 2006 and the District has entered into a three-year commitment to partially fund the position. This contract was renewed in 2009 and will continue at least through 2012. The District participates annually in the Washington County Watershed District Fair Booth in August.

The District continued an award program entitled "Conservationist of the Year" to recognize exemplary watershed conservation efforts. The annual award was given to Mrs. Dennis Stephens for her participation in the BMP cost-share program and encouraging others within her neighborhood to participate as well. Notification of this award was reported in local papers to promote the program and provide positive outreach for the watershed. This award will be continued annually.

e. Washington County Groundwater Plan: As part of Washington County's adopted Groundwater Management Plan, the County has taken a lead role in coordinating groundwater protection efforts. Brown's Creek Watershed District (BCWD) has been requested through the County Groundwater Plan to take a leading role in three activities.

The methods in which BCWD has working towards accomplishing the activities in 2009 are as follows:

ROLE: *Develop and adopt rules or policies on the quantity of water used in areas where existing wells and/or groundwater dependent natural resources could be negatively impacted by overuse of groundwater. Negative impacts include reduced flow to surface water bodies, lowering of lake or wetland levels, or interference with other wells.*

Accomplishments:

1. The Washington County Water Consortium has recommended four new rules for watershed districts to adopt to increase protection for groundwater resources in its report titled "Incorporating Groundwater Protection into Watershed District Rules" (December 2004). These rules included volume control standards, standards for protecting groundwater dependent natural resources, groundwater quality protections, and groundwater appropriations standards.

Brown's Creek Watershed District revised its rules, effective as of May 1, 2007. Many of these revisions provide enhanced surface and groundwater resource protection, specifically regarding additional volume control and groundwater dependent natural resource protection.

2. The BCWD will be working with Washington County and others to develop a Groundwater Dependent Natural Resource (GWDNR) Comprehensive Management Plan for the fen in Grant, MN. The methodology will be documented and approved by a Technical Advisory Panel with hopes of being able to cost-effectively duplicate this work for other wetland GWDNRs . This work was concluded in 2009.

ROLE: *Provide education to citizens and public officials on the inter-relation of surface and groundwater quality and quantity; the value of and need to protect groundwater recharge areas and wetlands; and implementation of best management practices and low-impact development and redevelopment strategies to protect groundwater resources.*

Accomplishments:

1. BCWD Board has continued to partner in the shared Stormwater Educator Position. The District participated in the Stormwater U training to educate municipal technical staff on volume control standards. BCWD held municipal training on the specific BCWD rule revisions in 2009.
2. BCWD BMP Cost-share Program was in its fourth year in 2009. Cost sharing on 23 rain gardens/shoreline restorations, increasing infiltration in an area developed prior to the District's volume control rules.
3. BCWD participated in the Washington County Watershed District Fair Booth in August 2009.
4. BCWD Board and staff periodically attend meetings of the municipalities within the district.
5. Reviewed community Local Water Management Plans.

ROLE: *For all new developments and re-developments, adopt rules controlling stormwater runoff volume and establish performance standards based on issues identified in water resource plans, inventories or studies, and on available scientific literature.*

Accomplishments:

1. BCWD adopted rules controlling stormwater runoff volume in 1999. This rule has been effective since January 1, 2000. The BCWD revised its rules, effective May 1, 2007. The volume control standard was revised from using a 1.5 yr rain event (2.6 inches) to 2 yr (2.8 inches) in 24 hours rain event, now compares proposed post-development runoff to pre-settlement conditions vs. pre-development, now promotes soil amendments to alleviate construction site soil compaction, and no longer gives an impervious allowance.

The District has begun developing a Groundwater Monitoring Program. Analysis of existing groundwater data for the District will be completed in 2010, which will allow for further steps to be determined.

At least one District Manager has served on the Washington County Groundwater Advisory Committee since the Committee's inception.

f. Washington County Water Consortium: The BCWD has also been an active participant in the Washington County Water Consortium. The Water Consortium, which was identified in the County's water governance study, is the process to be implemented to assure consistent performance between watershed districts in accounting, rules development, groundwater management, budgetary development and sharing of information regarding studies or research.

g. Minnesota Association of Watershed Districts: BCWD was an active participant in the Minnesota Association of Watershed Districts at the state level as well. One manager and the administrator attended the annual meeting as well as several associated meetings during the year. The District presented its work on the Groundwater Dependent Natural Resource Management Plan at the annual conference in 2009. President Leiser served on the MAWD Board in 2009 and continues this role in 2010.

h. Third Generation Management Plan: BCWD Third Generation management plan was adopted by BWSR in January 2007 and by the BCWD Board in February 2007. The District continues to implement the Third Generation Management Plan. As additional studies are completed, a major amendment may be necessary as soon as 2010. Planned additions may include: Brown's Creek Biota TMDL and Implementation Plan, Benz Lake Management Plan, Masterman Lake Management Plan, Long Lake Subwatershed Assessment, McKusick/Lily/Long Lakes TMDL, and Fen Management Plan, Kern Center Infiltration Retrofit.

i. BCWD Homeowner BMP Cost-share Program: The District approved 23 BMP cost-share projects within our targeted priority areas of subwatersheds direct draining to Long Lake, South School Section/Goggins Lakes, Benz Lake, or Brown's Creek. The District has generally seen one-year lag time between the technical assistance/Board approval and the homeowner installation of BMP. Each BMP generally reduces 0.25-0.5 lbs P/year from the receiving water body. The District follows the State Cost-share model, requiring a landowner agreement to retain and maintain the practice for at least 10 years.

Stillwater Country Club contacted the District and successfully completed a raingarden project. This partnership led to an application for a BWSR Clean Water Fund FY 2010 grant for additional BMPs. The project was awarded and will begin in 2010 to reduce 7% of the overall TSS load to Brown's Creek.

	2006	2007	2008	2009
# Approved	2	18 (4 outstanding)	17 (3 outstanding)	23 (18 outstanding)
# Installed	0	1-2006	1-2006 9-2007 3-2008	5-2008 4-2009
# Declined	0	5-2007	6-2008	1-2009
Subwatershed	Long Lake	Long Lake	Long Lake Brown's Creek Diversion	Long Lake Brown's Creek Bass Lake West Brown's Creek Diversion St Croix River

The District has also worked with LGU's on larger demonstration projects/cost-share projects in 2009. This program will continue in 2010.

j. Brown's Creek TMDL for Biota Impairment and Implementation Plan: BCWD completed the Phase I and II Biota Impairment Stressor Identification in conjunction with the Minnesota Pollution Control Agency and the Washington Conservation District in 2008. Several stake holder meetings and a District-wide open house was held to receive input in the TMDL process. The draft TMDL was developed in 2009 for total suspended solids, temperature and copper. The District is working with the MPCA to delist Brown's Creek for naturally occurring low dissolved oxygen levels in the upper reaches. The District has begun developing the TMDL Implementation Plan in 2010. Also in 2010, the District is implementing the joint project with Stillwater Country Club using CWF FY 2010 Grant funding. The District partnered with the Washington Conservation District and Middle St. Croix WMO for a Stormwater Audit program to inform residents of overall property stormwater impacts. Residents adjacent to Brown's Creek all received the opportunity to participate.

Partnered with Trout Unlimited for two Brown's Creek Restorations in 2009. The two project sites were on public property and addressed areas of streambank instability due to reed canary grass and increased shading along the creek. The District continues to work with riparian landowners in 2010 to increase buffers and streambank stability. Restorations to Mendel Wetland would improve the tamarack swamp itself, as well as improve water quality to Brown's Creek. Initial concept plans will be developed in 2010 and presented to all five private landowners to determine project potential.

k. McKusick Lake Management Plan: The District expanded the monitoring of the diversion structure drainage to McKusick Lake with an automated sampler and flow meters, as well as grab samples at additional sites along the Long Lake drainage system. The data will be analyzed in 2010 and presented jointly to the BCWD, Middle St. Croix WMO and the City of Stillwater in a joint meeting. The District is working with all MSCWMO and Stillwater and the MPCA to begin a three lake TMDL study on McKusick, Lily and Long Lakes in 2010.

l. Land Conservation Program & Plan Reviews: The District worked with Steve Hobbs and the Citizen Advisory Committee to develop land conservation priorities in 2008 and 2009. Reviewed the municipalities' comprehensive plans and local water management plans, assisting them with the integration of natural resource/open space planning. Reviewed Local Water Management Plans for the City of Stillwater, City of Grant, City of Oak Park Heights, City of Lake Elmo, Stillwater Township, and May Township. BCWD Board and staff periodically attend meetings of the municipalities within the district. The District has budgeted in 2010 to begin individual landowner communications to inform landowners of their unique resources.

m. Benz Lake Management Plan: The District worked with the Benz Lake Association and the City of Grant to finalize a Benz Lake Management Plan in 2009. The Board amended the cost-share priority areas to include Benz Lake. The District partnered with the Washington Conservation District and Middle St. Croix WMO for a Stormwater Audit program to inform residents of overall property stormwater impacts. Benz Lake residents all received the opportunity to participate.

n. Masterman Lake Management Plan: The District is working with the lake shore residents to develop a management plan for Masterman Lake, beginning in 2009 and to be completed in 2010.

o. Woodpile Lake Management Plan: The District plans to begin a management plan for Woodpile Lake in 2010.

APPENDIX A

2009 WATER MONITORING SUMMARY

This report focuses on the summary and comparison of the lake and stream water quality data collected by the Washington Conservation District (WCD) from 2000-2009 and previous monitoring seasons. In 2009, one stream monitoring site was added to the monitoring program with the goal of assessing the performance and effectiveness of the Ecostorm Plus Filtration System; Tributary to Long Lake at the Herberger's Pond Outlet. In addition to this site, BCWD continued to monitor Masterman Lake, Bass Lake East (82-0124), Bass Lake West (82-0123), Lynch Lake, July Avenue Wetland, Wood Pile Lake, Pat Lake, Goggin's Lake, Kismet Basin, Long Lake, South School Section Lake, Benz Lake, and Plaisted Lake. Brown's Creek was monitored at Highway 15, McKusick Road, Stonebridge and Highway 96; Long Lake drainage sites were monitored at 62nd St. and the Marketplace Pond; the tributary to McKusick Lake was monitored at the Brown's Creek Diversion Structure; and the Diversion drainage was monitored at Long Lake outlet, Jackson WMA outlet, and Boutwell Rd. crossing. Four additional branches of the Diversion drainage were also monitored beginning in 2009.

In 2009, the thirteen lakes monitored had good to very poor water quality ratings and were classified as, mesotrophic (Bass Lake East), eutrophic (Bass Lake West, Benz, Kismet Basin, Long Lake, Masterman Lake, Pat Lake, South School Section Lake and Wood Pile Lake) and hypereutrophic (Goggin's Lake, Plaisted Lake, July Avenue Wetland, and Lynch Lake).

The overall 2009 lake grades for BCWD lakes were:

Bass Lake East – B-
Wood Pile Lake – B-
South School Section Lake – B-
Bass Lake West – C+
Masterman Lake – C+
Pat Lake – C+
Long Lake – C+
Kismet Basin – C
Goggin's Lake – D+
Benz Lake – D+
Plaisted Lake –D+
July Avenue Wetland – D-
Lynch Lake – F

Of the lakes that were monitored in 2008, three lakes showed a slight deterioration in water quality for the 2009 season (Bass Lake West, Benz Lake and July Avenue Wetland), four lakes maintained their water quality (Long Lake, Plaisted Lake, Goggin's Lake and Lynch Lake), and six lakes improved in water quality (Bass Lake East, Woodpile Lake, Pat Lake, Masterman Lake, Kismet Basin and South School Section Lake). Goggin's Lake, Kismet Basin, Plaisted Lake and Lynch Lake were considered worse than the ecoregion range for total phosphorus, total Kjeldahl nitrogen, chlorophyll-*a,* and Secchi disk transparency. Bass Lake West was the only lake within the ecoregion range for total phosphorus, total Kjeldahl nitrogen, chlorophyll-*a*, and Secchi disk transparency. In 2009, the Washington Conservation District conducted Kendall Tau statistical analysis of all lakes monitored by WCD to determine any long-term water quality trends. For Brown's Creek Watershed District lakes, only two lakes had a significant trend. Goggin's Lake had a statistically significant decreasing Secchi transparency trend ($p<0.10$) and Long Lake had significantly increasing Secchi disk transparency and improving total phosphorus trends.

In 2009, BCWD added one stream monitoring station to its existing network of stream monitoring sites in an effort to assess the performance of the Ecostorm Plus Filtration System that was installed at the outlet of the Herberger's stormwater pond. The new station was installed to measure discharge, water chemistry, and water quality at the outlet of Herberger's Pond, post treatment by the Ecostorm system. BCWD continued monitoring stream/stormwater sites at: Brown's Creek at the mouth (Hwy 96), Brown's Creek at McKusick Road, Brown's Creek at Hwy 15, the Brown's Creek Diversion Structure, Long Lake Inlet at 62nd St., and Long Lake Inlet at Marketplace Pond.

Of the stream/stormwater sites monitored in BCWD, Brown's Creek at Hwy 15, Brown's Creek at Highway 96, Brown's Creek at McKusick Road and Long Lake Inlet at 62nd Street showed decreased total discharges in 2009 compared to 2008. These same sites showed reduced TP loads in 2009 compared to 2008. Brown's Creek at Highway 15, McKusick Road and at the Stonebridge, Long lake Inlet at 62nd Street and Long Lake Inlet at Marketplace Pond showed reductions in total loads of TSS during the 2009 season compared to 2008).

Temperatures in Brown's Creek for 2009 displayed some interesting results when looking at thermal impacts. As in 2008, the Highway 15, McKusick Road and Stonebridge sites recorded no daily minimum temperatures above 20° C. The minimum daily temperature at the outlet of Brown's Creek (Hwy 96) never exceeded 20° C, which is the temperature threshold where low impacts to trout survival are observed. One important and equally interesting note is that the temperature difference between the McKusick Road and Stonebridge sites did not vary as significantly as they did in 2008. This is difficult to explain, but may be due to the lack of precipitation in the summers of 2008 and 2009. This lack of rainfall may have prevented the stormwater pond that enters the creek downstream of the McKusick Road site from reaching capacity. This would have an effect on stream temperature because it would have prevented warm, stagnant water from discharging from the pond into the creek.

The MPCA and the MN DNR, as part of the Brown's Creek TMDL, conducted fisheries surveys in 2008 as well as historically as part of their biological monitoring programs. No DNR survey was conducted in 2009, but one is planned for 2010. The MPCA did conduct biological surveys in 2009. Data pertaining to historical fisheries surveys can be found by contacting the MPCA Biological Monitoring Section (http://www.pca.state.mn.us/water/biomonitoring/bio-staffdirectory.html) or MN DNR Division of Fish and Wildlife area fisheries office (http://www.dnr.state.mn.us/areas/fisheries/eastmetro/index.html). Due to differences in sampling procedures between agencies, variation in results, and the complexity of reporting these results while not being the organization that collected the data, those data are not shown in this report. Annual fish stocking occurred as it usually does on a yearly basis. In 2009, 1000 brown trout were stocked in Brown's Creek. This stocking follows the MN DNR long-term management plan for trout stocking efforts in Brown's Creek.

APPENDIX B

2009 AUDIT REPORT

See Attached