

3A SURFACE WATER MANAGEMENT

1. ISSUE

Poor management of surface water resources and surrounding land can have major impacts on water quality and flooding. Failure to take into account the context of the surrounding watershed when addressing surface water management issues can also result in solutions that are unsuccessful or have unintended consequences.

2. BACKGROUND

This chapter discusses some of the tools the CCWMO can use to manage shoreland, regulate floodplains and ditches, and control water levels. There is some overlap between the issues and information presenting in this chapter and those presented in the Urban Stormwater Management and Wetland Management chapters. Where appropriate, the Urban Stormwater Management and Wetland Management chapters are referenced here. For more detailed information on stormwater and wetland issues, please see those chapters.

2.1. Shoreland Management

The way in which lake and river shoreland areas are used and developed can affect water quality, water use, wildlife habitat, and the amount of open space in the landscape. In order to maintain or improve these features, the 1969 Shoreland Management Act required the MN DNR to develop and implement standards for the management of land within the shoreland area of lakes and streams. The minimum standards were initially developed by the MN DNR in 1970, revised in 1989, and are currently undergoing revisions again. These standards set guidelines for the use and development of shoreland property including: a sanitary code, minimum lot sizes, minimum water frontage, building setbacks, building heights, and subdivision regulations. Local units of government with shoreland are required to adopt these or stricter standards into their zoning ordinance.

As part of its Zoning Code, Carver County has adopted a Shoreland Management Ordinance that implements the statewide shoreland management standards. This ordinance is in effect in the unincorporated area of the county; cities in the county are not covered under the County Shoreland Management Ordinance. This Plan requires that each city adopt a shoreland ordinance or equivalent. The status of the city shoreland ordinances are summarized in Table 3A-1

Table 3A-1. Status of Shoreland Ordinances for Cities in the CCWMO

Municipality	Status			
	No Shoreland in the CCWMO	DNR Approved Ordinance (year approved)	DNR Approved Ordinance w/ Conditions (year approved)	No Record of Approved Ordinance
Carver				
Chanhassen	X			
Chaska		pre-1989 ¹		
Cologne				X
Hamburg	X			
Mayer				X ²
New Germany	X			
Norwood Young America			2005	
Victoria			1994	
Waconia		1995		
Watertown				X ³

¹ Chaska adopted an ordinance prior to publication of revised State Shoreland Rules in 1989.

² Mayer adopted and approved a shoreland ordinance in 2001.

³ DNR records show Watertown is in the process of developing a shoreland ordinance.

2.2. Floodplain Management

Regulatory Framework

State law defines the floodplain as the area covered by a flood that has a one percent chance of occurring each year, also known as the 100-year or regional flood. The floodplain is divided into two parts: the floodway and flood fringe. The floodway includes the river channel and those portions of the adjoining floodplain that are needed to discharge the 100-year flood. The flood fringe is the portion of the floodplain outside the floodway.

The MN DNR oversees the administration of the state Floodplain Management Program (see MN Statutes 103F.101 -103F.165 and MN Rules 6120.5000 - 6120.6200). The purpose of the program is to promote and ensure sound development in floodplain areas in order to protect the health and safety of the public, minimize loss of life, and reduce economic losses caused by flood damages. The MN DNR has developed minimum standards for floodplain management and requires all local floodplain regulations to be compliant with these minimum standards. LGUs that have floodplain management ordinances are shown in Table 3A-2.

Table 3A-2. Status of Floodplain Ordinances for Cities in the CCWMO.

LGU	Ordinance Adopted/Amended	DNR Approved	FEMA Map Date
Carver County (unincorporated areas)	1/21/92	8/17/92	1/06/88 (South Fork Crow River Letter of Map Revision 1/29/2004)
City of Carver	2/06/95	8/20/90(cond)	3/26/76
Chanhasen	3/11/91	4/02/91	7/02/79
Chaska	6/16/98	7/01/93	7/20/98
Cologne	None (Does not participate in NFIP)		None
Hamburg	None (Does not participate in NFIP)		None
Mayer		10/8/01	1/29/04
New Germany	None (Does not participate in NFIP)		None
Norwood Young America			No Significant Flood Hazard Area according to FEMA
Victoria	6/11/75		No Significant Flood Hazard Area according to FEMA
Waconia	4/13/92	8/05/92	1/05/78
Watertown	8/11/92	9/28/92	8/18/92

Because of the importance of the 100-year floodplain in storing and conveying a regional flood, the CCWMO will require mitigation of any volume lost due to fill in the floodplain.

The MN DNR has been delegated authority to oversee the Federal floodplain management program by the Federal Emergency Management Agency (FEMA). FEMA still has a significant impact on local floodplain regulation through its role in publishing local floodplain maps and the National Flood Insurance Program (NFIP).

Under NFIP, federally insured or regulated institutions must require flood insurance policies on all new loans for structures in mapped floodplain areas recognized by the Federal Emergency Management Agency (FEMA). Property located in the floodplain is available from the local building or zoning official ("Flood Hazard Boundary Maps" or "Flood Insurance Rate Maps" furnished by FEMA). Property owners should also be aware that they can buy flood insurance if they are not in a mapped floodplain on the FEMA maps, as long as their community is participating in the NFIP. In fact, a high percentage of the claims though the NFIP are for properties that are not within the mapped floodplain on the FEMA maps but that are affected by smaller basins or streams

Updated Flood Maps and Studies

Most of the flood studies and FEMA maps were done in the 1970's. As development pressures increase in the mapped floodplain areas, the need for updates and improvements to the official maps is becoming increasingly evident. In addition, the available technical information and models are much improved in the last 20-30 years. The FEMA maps for Chaska were updated in 1998 to reflect the U.S. Army Corps of Engineers major flood reduction project along the Minnesota River, Chaska Creek and East Creek. The FEMA maps for the City of Watertown were updated in 1992 to reflect a reduction in the 100 year flood volume. This recalculation resulted in a substantial lowering of the Regulatory Floodplain Elevation (RFPE) in the City. In January 2004 similar calculations were completed for the unincorporated areas affected by the South Fork Crow River and its tributaries. Digital Flood Insurance Rate Maps (DFIRMs) and establish Base Flood Elevations (BFEs) are being developed for this area.

2.3. Lake Management

Table 3A-3 summarizes the water quality standards for Lakes in the CCWMO. Additional information on lake management can be found in Section 2.6 of this chapter, Chapter 3B Impaired Waters, and Chapter 3K Monitoring and Assessment.

Table 3A-3. Lake Water Quality Standards

Lake	DNR Lake ID	Years Monitored	Impairment Status	Lake Goals		
				Total Phosphorus (ug/L)	Chlorophyll II-a (ug/L)	Secchi Depth (m)
Assumption	10-0063	1999	Unknown	< 60	< 20	>1.0
Aue	10-0028	1999	Unknown	< 40	< 14	>1.4
Barlous	10-0067	--	Unknown	< 60	< 20	>1.0
Barnes	10-0109	1999	Unknown	< 60	< 20	>1.0
Bavaria	10-0019	1974 - 2010	Not Impaired	< 40	< 14	>1.4
Benton	10-0069	1979 - 2010	Impaired	< 60	< 20	>1.0
Berliner	10-0103	1999	Unknown	< 60	< 20	>1.0
Brand	10-0110	1999	Unknown	< 60	< 20	>1.0
Braunworth	10-0107	1999	Unknown	< 60	< 20	>1.0
Burandt	10-0084	1999 - 2010	Impaired	< 40	< 14	>1.4
Campbell	10-0127	1999 - 2006	Impaired	< 60	< 20	>1.0
Donders	10-0079	--	Unknown	< 60	< 20	>1.0
Eagle	10-0121	1979 - 2010	Impaired	< 60	< 20	>1.0
Gaystock	10-0031	1999 - 2006	Impaired	< 60	< 20	>1.0
Goose	10-0089	1979 - 2010	Impaired	< 60	< 20	>1.0
Hazeltine	10-0014	1999 - 2010	Impaired	< 60	< 20	>1.0

Table 3A-3. Lake Water Quality Standards

Lake	DNR Lake ID	Years Monitored	Impairment Status	Lake Goals		
				Total Phosphorus (ug/L)	Chlorophyll II-a (ug/L)	Secchi Depth (m)
Hydes	10-0088	1985 - 2010	Impaired	< 40	< 14	>1.4
Jonathan	10-0217	2002 - 2010	Impaired	< 60	< 20	>1.0
Kelly	10-0021	--	Unknown	< 60	< 20	>1.0
Lippert	10-0104	1999	Unknown	< 60	< 20	>1.0
Long	10-0016	2001 - 2003	Unknown	< 60	< 20	>1.0
Maria	10-0058	1999 - 2005	Impaired	< 60	< 20	>1.0
McKnight	10-0216	2006 - 2010	Impaired	< 60	< 20	>1.0
Meuwissen	10-0070	1979 - 2008	Impaired	< 60	< 20	>1.0
Miller	10-0029	1994 - 2010	Impaired	< 60	< 20	>1.0
Millman	10-0090	--	Unknown	< 60	< 20	>1.0
Mud	10-0094	--	Unknown	< 60	< 20	>1.0
Myers	10-0068	1999	Unknown	< 60	< 20	>1.0
Oak	10-0093	1973 - 2008	Impaired	< 60	< 20	>1.0
Patterson	10-0086	1999	Unknown	< 60	< 20	>1.0
Reitz	10-0052	1985 - 2010	Impaired	< 40	< 14	>1.4
Rice	10-0078	1999	Unknown	< 60	< 20	>1.0
Riverpointe Pond	10-0250	--	Unknown	< 60	< 20	>1.0
Rutz	10-0080	2000 - 2010	Impaired	< 60	< 20	>1.0
Scott	10-0022	--	Unknown	< 60	< 20	>1.0
Swan	10-0082	1999	Unknown	< 60	< 20	>1.0
Swede	10-0095	1996 - 2010	Impaired	< 60	< 20	>1.0
Tiger	10-0108	1999 - 2003	Impaired	< 60	< 20	>1.0
Unnamed Lake (Hilk)	10-0085	1999	Unknown	< 60	< 20	>1.0
Unnamed Lake	10-0149	--	Unknown	< 60	< 20	>1.0
Unnamed Lake	10-0150	--	Unknown	< 60	< 20	>1.0
Unnamed Lake	10-0151	--	Unknown	< 60	< 20	>1.0
Unnamed Lake	10-0181	--	Unknown	< 60	< 20	>1.0
Unnamed Lake	10-0187	--	Unknown	< 60	< 20	>1.0
Unnamed Lake (Grace)	10-0218	2002 - 2010	Impaired	< 60	< 20	>1.0
Waconia	10-0059	1948 - 2010	Not Impaired	< 40	< 14	>1.4
Winkler	10-0066	1976 - 2010	Impaired	< 60	< 20	>1.0
Young America	10-0105	1999	Unknown	< 60	< 20	>1.0

2.4. Stream Management

Stream Setbacks

Definition and Justification.

Like wetland transition setbacks, stream setbacks provide many benefits and functions. The area of natural vegetation next to the stream acts at the “right of way” for a stream and functions as an integral part of the stream ecosystem. This transition area helps protect streams from the impacts of development: for example, pollution from stormwater runoff or changes in the volume, rate, frequency, or duration of stormwater entering the streams. Some of the benefits of stream setbacks include¹:

- Maintaining stream “right of way” allowing for lateral movement of stream
- Providing effective flood control and reducing small drainage problems & complaints
- Protecting streambank from erosion
- Increasing property values
- Reducing watershed imperviousness
- Increasing pollutant removal
- Providing food and habitat for wildlife

Purpose and Application.

In order to provide continuity and uniformity throughout the watershed, the CCWMO will develop minimum stream setbacks to be implemented in all areas of the CCWMO (setbacks for wetlands are discussed in the Surface Water Management Chapter). Cities within the CCWMO can choose to adopt and enforce stream buffer standards that are stricter than the stream setbacks of the CCWMO.

General Description of Setback Requirements.

Stream setbacks may be required as part of any new development or redevelopment and will apply to watercourses identified in the 2000 Carver County Stream Inventory. Setbacks will begin at the bankful elevation and must be established in appropriate vegetation. After becoming established, the vegetation in the setback area should be maintained in a natural state. Stream setbacks are not intended to restrict all use of the area or to restrict all types of vegetation management within the area (e.g. some types of buffer harvesting may be allowed). Stream setback areas containing adequate natural vegetation before development occurs may be preserved without planting additional vegetation.

¹T. Schueler and H. Holland, eds. (2000). The practice of watershed protection: the architecture of urban stream buffers. Ellicott City, MD: Center for Watershed Protection.

This Plan recommends the following factors for consideration in regards to future stream setback regulatory requirements:

1. Consider existing stream and ditch programs and regulations (Minnesota Public Drainage Law, the Shoreland Management Act, and buffer programs available through the NRCS and SWCD) during the development of stream setbacks.
2. Allow flexibility in the width of the setback based on pre-existing uses, slope, stormwater flow, stream restoration opportunities.
3. Allow the standard setback to be decreased (but not eliminated) if the site design mitigates for the setback decrease elsewhere on site by preserving or enhancing other natural site features. For example, setbacks may be reduced for preserving upland areas that are adjacent to the stream and extend beyond the standard setback.
4. Most linear projects should be exempt from the stream setbacks based on site specific criteria that will be developed as part of the CCWMO Rules update.

Stream Restoration

Stream restoration is a valuable tool that will help achieve TMDL goals for specific water bodies that are affected by stream bank erosion. In order to maximize the benefits associated with stream restoration, the County will identify and prioritize stream restoration opportunities. The following factors will be considered:

- Availability of funding
- Feasibility of implementation
- Number of project partners
- Projects that provide multiple benefits will be prioritized above projects that provide only one benefit
- Projects that restore streambanks in a more natural setting will be prioritized above project that restore streambanks in developed areas,
- Projects that utilize bioengineered solutions will be prioritized above projects that utilize more traditional engineering techniques,
- Inclusion of restoration area on other County or LGU priority lists,
- Inclusion of restoration area in TMDL implementation plans,
- Benefits provided by restoration area to impaired water bodies, and
- Balancing restoration opportunities among major watersheds in the CCWMO.

Channel Obstructions

Trees continue to provide ecological benefits even after they have fallen into a stream or river. Tree branches, bark, and trunks that fall into streams increase the diversity of habitat within the stream and provide cover and food for fish and macroinvertebrates living in the stream. If a fallen tree is still connected to the bank by its root system, the intact roots also help to prevent stream bank erosion during seasonal floods and high flows. In some cases fallen trees, and/or accumulated vegetation in a creek or stream can create a dam effect and cause flooding to nearby property or the slowing of drainage away from property. To address the removal of channel obstructions, the CCWMO will use the following guidelines concerning this issue:

If an obstruction fills approximately 75% of the bankful channel an evaluation may be requested. County staff will evaluate the obstruction to determine if its overall effect on flow is significant and/or if the obstruction in the channel may cause potential threats of flooding to nearby dwellings. If an obstruction does not fill 75% of the bankful channel, but the water level change across the obstruction is significant, staff may perform further technical evaluations to determine if the obstruction should still be removed from the channel. If it is determined that the obstruction be removed, the County will request the riparian landowner to remove the obstruction. The County reserves the right to assist the riparian landowner with the removal of an obstruction on a case-by-case basis. If the County seeks removal of a woody debris obstruction, the site must be evaluated for post removal restoration due to the impacts of the removal activity to the banks, bed, and flow characteristics of the site. Keep in mind that all existing legislation and regulations apply (i.e. State Protected Waters). Riparian landowners may clear a channel as long as they don't alter the bank, however, additional restrictions do apply for beaver dams. The DNR should be contacted for advice, clarification, or permit applications related to alterations to protected waters.

2.5. Ditch Regulations

Agriculture in Minnesota depends upon a network of artificial drainage, including open ditches, trenches, and underground tile systems. In Carver County, this public drainage system is under the jurisdiction of the County Ditch Board (see Figure 17 in the Land and Water Resource Inventory Chapter). The makeup of the Ditch Board is based on the location of the ditch system and could include Carver County Board members as well as neighboring County Board members. The Carver County Board also has jurisdictional authority over the CCWMO. The County Ditch Board can issue work orders to construct, maintain, or improve drainage systems based on petitions from landowners whose property is drained by the public system. Additional information on ditch regulations can be found in Minnesota Statutes Chapter 103E.

Benefits of Artificial Drainage

Many soils in Carver County have poor natural drainage and would remain waterlogged for several days after excess rain without artificial drainage. Saturated soils do not provide sufficient aeration for crop root development and most crops grown in Minnesota will not tolerate saturated soil conditions for more than a couple days. Artificial drainage is typically utilized on soils with slow water permeability or soils with layers that restrict water movement. Artificial drainage can provide economic benefits by increasing crop yields by allowing more timely fieldwork and reducing stress to growing crops.

Impacts of Artificial Drainage

Although agricultural drainage improves agricultural production, there are concerns about its potential negative impacts on natural hydrologic processes and the water quality of water bodies receiving water from artificial drainage systems. These impacts may contribute to surface water impairments in the County.

Hydrologic Effects.

Artificial drainage systems are designed to remove excess water from waterlogged soils more rapidly than under natural hydrologic conditions. Artificial drainage eliminates the natural system of storage in a watershed by draining or partially draining depressions. There are concerns about the downstream hydrological effects of artificial drainage. Streams and ditches in watersheds with artificial drainage have become "flashier" over time, carrying more water and rising more rapidly after storm events. This "flashiness" can increase the rate of bank erosion, cause localized flooding, and lead to increased turbidity and lower levels of dissolved oxygen in the stream.

Water Quality.

Subsurface flow moving through the soil to underground tile systems can carry nitrates, phosphorus, fertilizers, pesticides, manure, and other soluble constituents that end up in nearby surface water. In addition, surface intakes provide a more or less direct pathway for sediment and other contaminants in surface runoff to reach nearby surface waters.

CCWMO Interaction with Ditch Regulations

Buffer Requirements.

Buffers along newly constructed public ditches have been required by Minnesota Statute 103E.021 since the 1970s. Since many public ditches in the county were constructed prior to the 1970s, the requirement to install permanent grass buffer strips is most often triggered when there is a petition for a public drainage ditch improvement or a redetermination of benefits. The CCWMO supports and encourages the use of grass buffer strips along the public drainage system as required by Minnesota Statute 103E.

CCWMO Projects.

Any CCWMO projects that would alter the public drainage system must go through the petition process outlined in Minnesota Statutes 103E. Such projects may include outlet improvements, impoundments, improvements, or abandonments.

Mitigating the Impacts of Artificial Drainage.

The CCWMO encourages the use of best management practices (BMPs) that mitigate the impacts of artificial drainage. The following list of recommended BMPs for ditches is based on the Natural Resources Conservation Service's Conservation Practice Standards. Technical assistance in implementing these BMPs and cost share funding will be available from the SWCD. Ditch projects would be permitted under the CCWMO water rules process.

- Access Control
- Channel Bank Vegetation
- Controlled Drainage
- Critical Area Planting
- Dam
- Diversion
- Fish Stream Improvement
- Grad Stabilization Structure
- Lined Waterway or Outlet
- Mulching
- Pond
- Prescribed Burning
- Prescribed Grazing
- Riparian Forest Buffer
- Riparian Herbaceous Cover
- Sediment Basin
- Streambank and Shoreline Protection
- Structure for Water Control
- Subsurface Drain
- Surface Drainage Field Ditch
- Surface Ditch (Main or Lateral)
- Underground Outlet
- Upland Wildlife Habitat Management
- Vegetated Treatment Area
- Vegetative Barrier
- Water and Sediment Control Basin
- Wetland Creation
- Wetland Restoration
- Wetland Wildlife Habitat Management
- Adaptive Management Practices

2.6. Water Body Outlets and Control Structures

The condition of control outlets for water bodies can have significant impacts on riparian property and flora and fauna habitat both by flooding and low water levels. Unnatural fluctuation in water level is detrimental. For example detrimental impacts from flooding can cause the following:

- Excessive erosion and sedimentation;
- Flooding of nesting sites;
- Degradation of vegetation due to excessive water levels;
- Damage to nearby structures;

On the other hand examples of detrimental impacts due to lowering water levels by artificial design can lead to:

- Alteration of the nature of lakes and wetlands;
- Alteration of the value of recreation and aesthetics;
- Impacts on flora and fauna habitat;
- A threat to water supplies;

The outlets of many basins within Carver County have been artificially altered over time by damming, excavation (or blasting) of outlet ditches to lower levels, or construction of water level control structures and dams. Permits are required from the DNR for any alteration to the outlet of a Public Water or Public Water Wetland, and for the construction of dams (in excess of 6 feet and with a maximum storage capacity of 50 acre-feet or more). In many cases, the alterations were done before the DNR (formally the Department of Conservation) required permits or without going through the legal permit process. There can be considerable controversy regarding both existing outlet structures and proposed changes to outlets. Often there is disagreement among riparian property owners and/or the public over what the “right” water level is on a basin. Often there is no party responsible for repairing the structure and the outlet structure falls into disrepair. State law provides guidelines on what may be permitted by the DNR for construction, replacement or repair of an outlet structure, or for alterations at the outlet that would affect water levels. However, the DNR cannot force a private party or LGU to construct or repair an outlet structure. State law encourages units of government to be responsible for dams and outlet structures. The CCWMO will respond on a case by case basis to citizen, landowner, and municipal concerns regarding outlet elevation concerns.

Table 3A-4 lists lakes with outlet concerns identified at the time of the writing of this Plan. Other water control structures may exist that are not included. These structures will be dealt with in accordance with Plan policy. Table 3A-5 lists dams and control structures with DNR permits.

Table 3A-4. Lakes with Historical Outlet Concerns

Lake Name	DNR ID	Outlet Concern/Status
Barnes Lake	10-109P	This outlet is located on private property and goes under T.H. 212. The current structure is a mix of culvert sizes and types in various levels of repair. Concerns about high water levels persist.
Berliner Lake	10-103P	This dam was replaced in 1999 under a DNR Wildlife permit on private land. The outlet is consistent with a 1958 court order. There continue to be disputes about the water levels and whether to place a control structure between the “upper” and “lower” lakes. Also, DNR Wildlife is concerned that DNR does not own, or have legal easements for, the land where the dam is located.
Brand Lake	10-110P	General concerns have been raised about the condition of the outlet (which is a ditch to a culvert under County Road 33) leading to high water levels.
Burandt Lake	10-84P	The existing outlet on private land does not have a DNR permit. The current outlet is controlled by a pile of rubble that is easily manipulated. Lake residents have had concerns with high and low waters due to damming or removal of the rubble pile. Local legend is that the outlet was blasted open while everyone was at church one Sunday morning in the 1940's, lowering the lake. The City of Waconia is on record requesting County action on the structure. A new outlet has been designed but no additional action has been taken.
Miller Lake	10-29P	A request to dredge at the outlet in order to lower the lake by two feet was an issue in the late 1970's and early 1980's. Two landowners applied for a DNR permit to lower the lake and many other residents were opposed to such action. The application was denied by DNR (January 3, 1983), and went through the appeal process the next year.
Oak Lake	10-93P	There have been disputes about the flow direction of the natural outlet and the outlet elevation. Carver County has worked with landowners since 2003 and has designed a new sheetpile structure to establish the OHW. To date, no action has been taken due to lack of easement agreement with the landowner.
Schneewind Wetland	10-187P	Culverts in the existing dam at the outlet need replacement. Use of the dam road for access to private homes was raised in 1999. DNR Wildlife, which manages the Schneewind Wildlife Management Area, has considered plans to raise the dike to raise the water levels for a wildlife habitat enhancement project.
Swede Lake	10-95P	There have been disagreements among the lakeowners about the level at which the lake should be set. DNR considers the basin to be officially landlocked since the control elevation in the outlet ditch is above the ordinary high water elevation. High water levels have led to several Watertown Township and resident meetings. A Clemson leveler was installed in the summer of 1996 to alleviate beaver dam problems.
Lake Waconia	10-59P	Since the early 1900's, records indicate issues related to the outlet of Lake Waconia. There was an official DNR (Department of Conservation at that time) hearing in the early 1950's regarding a dam structure. The hearing resulted in a 2/11/52 Findings of Fact and Order that DNR issue a permit to Carver County for a 50' wide weir dam structure with a control elevation of 962.9' (NGVD, 1929). The County passed a resolution disagreeing with the elevation in the order and did not construct the dam. The existing County Road 10 culvert was constructed in 1961 and serves as the outlet to the lake.

Table 3A-5. Dams and Control Structures with DNR Permits

Lake Name	DNR ID	Permit No.	Notes
Berliner Lake	10-103P	Permit 1999-6089	Permit was issued 5/13/99 to DNR Wildlife to replace the existing dam that was built pursuant to 4/1/58 Commissioner's Order.
Crow River, South Fork	-	Permit 1989-6117	Permit was issued 10/19/88 to the City of Watertown to reconstruct a low dam at the city park on the Crow River, South Fork.
Goose Lake	10-89P	Permit 2004-3121	Permit was issues 2/17/2004 to Carver County to replace existing outlet control structure with two 24-inch RCPs, a sheet pile weir, and rip rap.
Lake Grace	10-218W	Permit 1967-799	Permit was issued 10/11/67 to Ace Development Company for the "McKnight Dam" in Chaska. Based on a city resolution in the permit file, the City of Chaska took over responsibility of the dam in accordance with a developer's agreement.
Rutz Lake	10-80W	Permit 1995-6185	Permit was issued 10/31/95 to Stan Heldt to replace the Rutz Lake outlet.

2.7. Surface Water Use

Surface water use is governed by Minnesota Statute 86B. The statute enables local units of government to adopt a water use ordinance that regulates water use, access, the type and size of watercraft allowed to use a water body, noise limits, watercraft speed, areas of use, time of use, motorized vs. non-motorized use, etc. Carver County has not adopted a surface water use ordinance but the Carver County Sheriff is authorized under the statute to enforce its provisions. For issues relating to surface water use of water bodies wholly or partially within municipal boundaries, the CCWMO defers to the appropriate municipality. Issues pertaining to surface water use of water bodies with township areas of the CCWMO will be addressed through the WENR committee.

3. OVERALL SURFACE WATER MANAGEMENT GOAL

Goal SW-1 Maintain or improve the physical, chemical, biological, and aesthetic condition of surface water resources in the CCWMO, taking into account the watershed context of each resource.

4. SURFACE WATER MANAGEMENT POLICIES

Policy SW-1 **Shoreland Management.** Require all LGUs to update and implement their shoreland ordinance or equivalent development standards in accordance with state regulations.

Policy SW-2 **Floodplain Management.** Maintain or increase existing water storage capacity below 100-year flood elevations on all waterbodies within CCWMO in order to minimize the severity and frequency of flooding and high water.

Policy SW-3 **Floodplain Management.** Support updates to flood studies and FEMA map revisions as needed or feasible.

Policy SW-4 **Floodplain Management.** Require all LGUs to update and implement their floodplain ordinance or equivalent development standards in accordance with state regulations and this Plan.

- Policy SW-5 **Stream Management – Stream Setbacks.** Develop stream protection standards (e.g. flexible stream setback standards) that balance environmental protection with sound science and the rights of the private landowner and build on existing studies and available scientific information.
- Policy SW-6 **Stream Management – Stream Restoration.** Prioritize restoration of eroded areas on natural streams and/or creeks based on availability of funding, feasibility of implementation, number of project partners, projects that provide multiple benefits will be prioritized above projects that provide only one benefit, projects that restore streambanks in a more natural setting will be prioritized above project that restore streambanks in developed areas, projects that utilize bioengineered solutions will be prioritized above projects that utilize more traditional engineering techniques, inclusion of restoration area on other County or LGU priority lists, inclusion of restoration area in TMDL implementation plans, benefits provided by restoration area to impaired water bodies, and balancing restoration opportunities among major watersheds in the CCWMO.
- Policy SW-7 **Stream Management – Channel Obstructions.** Support landowner assistance in evaluating and mitigating the impacts of naturally occurring debris jams on a case by case basis.
- Policy SW-8 **Stream Management – Volume Reductions.** Promote additional storage and volume reduction across the watershed through wetland restoration, regional ponding, stream or ditch diversions and impoundments, etc.
- Policy SW-9 **Ditch Regulations.** Recognize that historic and current agricultural land uses depend on artificial drainage.
- Policy SW-10 **Ditch Regulations.** Maintain the functions of ditches in such a way that the ditch system does not have a detrimental effect on lake and stream water quality (encourage adequate buffers, stable channels, etc).
- Policy SW-11 **Ditch Regulations.** Encourage the use and maintenance of best management practices for ditches that mitigate some of the negative effects of ditched systems while not impeding drainage.
- Policy SW-12 **Outlet Control Structures.** Work with LGUs, landowners, and the MN DNR to construct, replace, or repair dams and outlet control structures in the CCWMO. The CCWMO will become involved in the construction, replacement, or repair of an outlet control structure when one or more of the following factors or situations exist:
- Detriments to the public health and safety or the environment have been demonstrated or are likely due to the condition of an existing dam or outlet structure that does not already have a responsible party to repair and maintain the structure.
 - There is demonstrated need for alteration at an existing outlet where the impacts from the basin or the watershed crossed more than one political boundary.
 - Historical or current disagreements among riparian owners exist on the appropriate type of control structure or outlet condition and a majority of the riparian landowner petition the County to assist in the matter.

- The existing outlet structure is easily manipulated.

Policy SW-13 **Education.** Promote education about the benefits associated with the proper management of surface water resources.

5. SURFACE WATER MANAGEMENT IMPLEMENTATION

- Imp Strategy SW-1 **Regulatory Controls & Enforcement.** The CCWMO relies on Carver County Land Management Department to regulate and enforce floodplain and shoreland regulations, including the following activities:
- a. Shoreland Management
 - Review local water plans for compliance with shoreland requirements of this plan.
 - Update the Shoreland Management component of the County's Zoning Ordinance to reflect upcoming changes to the minimum shoreland standards in Minnesota Rules Chapter 6120.
 - b. Floodplain Management
 - Review local water plans for compliance with the floodplain management requirements of this plan.
 - Amend County ordinances so that any volume lost due to fill in the floodplain is mitigated within the same stream reach.
 - Complete floodplain map updates as needed.
- Imp Strategy SW-2 **Stream Management – Stream Setbacks.** Update county ordinance to incorporate stream setbacks. Amend the CCWMO Rules to include stream setback standards. Flexible stream setbacks will be developed using information from the WFVA, NRA, and the factors described in this plan (See Section 2.4).
- Imp Strategy SW-3 **Stream Management – Stream Setbacks.** Update the 2000 Carver County Stream inventory.
- Imp Strategy SW-4 **Stream Management – Stream Restoration.** Prioritize stream restoration sites using information from existing studies, TMDL Implementation Plans, and the criteria described in this plan (see Section 2.4).
- Imp Strategy SW-5 **Stream Management – Volume Reductions.** Prioritize regional ponding projects using Total Maximum Daily Load Studies and Implementation Plans, Local Surface Water Management Plans, and other studies.
- Imp Strategy SW-6 **Stream Management – Channel Obstructions.** Provide technical assistance to landowners in evaluating the impacts of naturally occurring debris jams if the obstruction fills approximately 75% of the bankful channel. If it is determined that the obstruction be removed, the County may request the riparian landowner to remove the obstruction. The County reserves the right to assist the riparian landowner with the removal of an obstruction on a case-by-case basis.

- Imp Strategy SW-7 **Ditch Regulations.** The Minnesota Public Drainage Law is administered through the Carver County Ditch Board, the Carver County Auditor, and Carver County Soil and Water Conservation District.
- Imp Strategy SW-8 **Ditch Regulations.** Provide technical and financial assistance for BMPs that mitigate some of the negative effects of ditched systems while not impeding drainage. The CCWMO relies primarily on the SWCD to implement this strategy.
- Imp Strategy SW-9 **Ditch Regulations.** Review ditch projects (cleanouts, maintenance, improvements) through the Carver County Ordinance to encourage the use of adequate buffers, stable channels, etc. The CCWMO relies primarily on the SWCD to implement this strategy.
- Imp Strategy SW-10 **Outlet Control Structures.** The CCWMO will have a role in the following activities related to outlet controls:
- Work with the DNR in resolving conflicting interests of riparian property owners and/or the general public;
 - Modeling to assist the DNR in determining the appropriate water level control elevation and capacity for a structure;
 - Structure design and construction;
 - Operation and maintenance of outlet controls; and
 - Funding construction, operation, and maintenance of structures. The CCWMO will seek outside funding of these costs including funding from affected/benefited properties.
- Imp Strategy SW-11 **Education.** Incorporate the goals, policies, implementation activities listed in this Surface Water Management Chapter into the CCWMO education program. Public involvement processes will be included in the implementation of the activities described above.