3C URBAN STORMWATER MANAGEMENT

1. ISSUE

Urbanization has and will continue to substantially increase the rate and amount of surface water runoff due to an increase in impervious surfaces. Historically, unmanaged stormwater runoff during and after construction has increased sedimentation and flooding in downstream areas. This chapter focuses on existing federal, state, and local requirements for managing stormwater during and after construction as well as other stormwater management strategies and practices.

2. BACKGROUND

2.1. Water Quantity and Water Quality in Urban Areas

Carver County and its communities are currently experiencing a high level of growth. An unavoidable outcome of this growth is the conversion of land from rural/agricultural use to urban use (residential, commercial, roads, etc.) Proper management of stormwater both during and after construction can decrease the potential for flooding and protect water quality.

During construction, land is highly susceptible to erosion, especially when Best Management Practices (BMPs) addressing erosion and sediment control are not installed and maintained properly. Sediment is considered to be one of the most damaging pollutants in Minnesota, and is the major pollutant by volume in state surface waters. Runoff from construction sites is by far the largest source of sediment in developing urban areas. Sediment-loading rates from construction sites are 5 to 500 times greater than those from undeveloped land (USEPA, 1977). Proper design and installation of erosion and sediment control BMP's along with monitoring of their effectiveness and maintenance when required can help reduce sediment loading rates from developing areas.

After construction is finished, developed areas typically have more impervious surface, infiltrate less water, and have larger runoff volumes and rates. In addition, the traditional approach to managing urban runoff confines runoff to pipes and ditches and concentrates large volumes of water into small conduits. The result is high water velocities at the outlets and increased erosion and sedimentation in creeks and streams and along shoreland. Research conducted in many geographic areas, concentrating on many different variables, and employing widely different methods have shown similar results; stream degradation occurs at relatively low levels of watershed imperviousness (10-20%). Degradation occurs due to increases in the volume and velocity of stormwater runoff; and sediments and toxic substances the stormwater picks up.

2.2. CCWMO Responsibility

Minnesota State Statute 103B and Minnesota Rules 8410 authorize the WMO to regulate the use and development of land in the watershed in order to protect, preserve and manage natural surface and groundwater systems within Carver County in the face of rapid urban growth and intensive agricultural activity. The County recognizes that primary control and determination of appropriate land uses is the responsibility of the LGUs. However, it is the intention of the County to ensure that land or water alterations within the CCWMO proceeds in conformity with this Plan, in addition to conforming with the plans and ordinances adopted by LGUs. To that end, the County has developed Water Resource Management Standards (Carver County Ordinance Title XV, Chapter 153). The ordinance outlines the County's role in permitting land or water alterations including, stormwater design standards, erosion and sediment control standards, site plan review, site inspection, enforcement of the ordinance, etc.

2.3. NPDES Requirements within the CCWMO

Under the EPA's Clean Water Act, the State of Minnesota has the authorization to administer the National Pollutant Discharge Elimination System (NPDES) program. The goal of the NPDES is to reduce the amount of pollution that enters surface and ground water in the form of stormwater runoff through regulation of construction sites disturbing more than one acre, Municipal Separate Storm Sewer Systems (MS4's), and industrial discharges.

Construction

The most active area of the NPDES program in the County is the Construction Stormwater Permitting Program. Controlling erosion during construction is necessary to significantly reduce the amount of sedimentation and other pollutants transported.

An NPDES Construction Permit is required for any construction activity that disturbs:

- One acre or more of soil.
- Less than one acre of soil if that activity is part of a "larger common plan of development or sale" that is greater than one acre.
- Less than one acre of soil, but the MPCA determines that the activity poses a risk to water resources.

Site owners and their construction operators must sign the NPDES Construction Permit, which includes a site-specific SWPPP that shows the controls used both during and after construction is completed. County inspectors, working closely with the MPCA, are responsible for field inspections and enforcement of permit requirements within the County.

MS4s

An MS4 is typically a City, serving populations under 100,000 that is located in urbanized areas; however the County is also an MS4. These MS4's are required to obtain the NPDES Phase II permit which takes a "Best Management Practice (BMP)" approach. Each MS4 must develop, implement, and enforce a Storm Water Pollution Prevention Plan (SWPPP) designed to minimize the discharge of pollutants to maximum extent practicable. Within the CCWMO, the current MS4s are Carver County, City of Carver, City of Chanhassen, City of Chaska, City of Victoria, City of Waconia, Laketown Township, and the Minnesota Department of Transportation. To minimize

duplication and increase efficiency, the CCWMO collaborates with the cities and townships to help meet their MS4 requirements in the most efficient way.

Industry

A third area of the MPCA's NPDES Stormwater Program is the Industrial Stormwater Permitting Program whose goal is to reduce the amount of pollution that enters surface and ground water from industrial facilities in the form of stormwater runoff. This goal is accomplished through developing individual site SWPPPs which describes the potential significant pollutants generated from the site and the BMP's that will be implemented to reduce them. Industries can also certify a condition of No Exposure.

3. STORMWATER MANAGEMENT REGULATIONS

The County stormwater regulatory program can be categorized into two areas of management, quantity and quality. Both categories affect downstream resources and have secondary affects on the biota, vegetation, fisheries and overall natural resources.

3.1. Water Quantity

Urban development disrupts the natural water cycle and alters the hydrology, including the rate and volume of runoff, of watersheds and streams. Potential water quantity concerns resulting from stormwater include (among others):

- **Larger volume of runoff**. Development causes land surface changes - like increases in impervious surfaces and soil compaction - that dramatically increase the total volume of runoff generated in a watershed. As the amount of impervious surface increases in a watershed, the amount of natural vegetation and natural storage decrease, resulting in larger volumes of stormwater runoff. For example, converting a farm field to an urbanized area typically doubles the volume of runoff; converting forested areas to impervious surfaces can result in a nine fold increase in stormwater runoff. Larger volumes of stormwater runoff can lead to flooding on neighboring properties or other offsite impacts.

- **Reduced groundwater recharge**. Urbanization reduces the amount of rainfall recharging ground water aquifers by limiting the land area available for infiltration. This can be particularly detrimental to stream ecosystems during the drier months, since shallow groundwater may not be available for base flows.

- **Increased flow rates**. Impervious surfaces and compacted soils, as well as improvements to the drainage system such as storm drains, pipes, and ditches, increase the speed at which rainfall runs off land surfaces within a watershed. Rainfall quickly runs off impervious surfaces instead of being absorbed and released gradually as in more natural landscapes. Higher and faster flows due to development can cause erosion on neighboring properties and degrade aquatic habitats.

In order to address the impacts of development on water quantity, the CCWMO has developed rate and quantity standards for stormwater design to mitigate impacts from development. Water Resource Management Standards are given in Carver County

Ordinance Title XV, Chapter 153. The goal of the CCWMO is to manage runoff from development by utilizing BMPs or low impact development techniques to resemble or maintain pre-development hydrological conditions. The ordinance includes standards for:

- **Rate Control**. Flow rates can be lowered through the use of ponding or "live storage." Peak rates shall not increase from existing conditions for the 2-, 10-, 100-year 24-hour storm events, and the 100-year, 10-day snowmelt event.

- **Managing Stormwater Onsite**. Onsite stormwater management helps reduce the impacts of volume increases downstream.

- **Soil amendments**. The visible impact of development is the "rooftops" and pavement, however the extensive earthwork and grading involved with site preparation compact soils, decreasing vertical movement and increasing runoff. As part of the site review process, the CCWMO requires sites to replace top soil, deep rip the soils, or change the model input values from farm land to compacted soil to mitigate the impact.

- **Filtration/Bioretention**. In addition to providing water quality treatment, filtration/bioretention helps alleviate water quantity issues by through plant uptake and extended detention. (See Section 3.2.3 for additional information)

- **Floodplain Alteration**. The reduction of floodplain volume as a result of development and/or improper management can contribute to high water levels as well as pose a risk to property and public safety. Proposed reductions in floodplain volume are allowable only if they do not cause a net decrease in flood storage capacity. If a decrease in flood storage is demonstrated, the lost volume must be replaced. (See Section 3.3 for additional information)

- **Creek and Stream Protection**. When fields and forests are converted to impervious surfaces, the volume and frequency of runoff increases significantly. Urbanization can cause channels to expand two to ten times their original size to adjust to the increased volume and frequency of runoff. To protect receiving channels, extended detention of 24 hours should be provided for the runoff generated from the 1-year 24-hour storm of 2.3 inches for direct discharges to natural streams. (See Section 3.4 for additional information)

3.2. Water Quality

As impervious surfaces increase, more water flows off the landscape and is delivered to receiving waters more quickly. As water washes over developed landscapes it picks up materials lying upon those surfaces and delivers them to receiving waters. These materials can include sediment from construction erosion, oil and grease from automobiles, salt and other deicing chemicals from roadways and parking lots, and fertilizer and pesticides from lawns. These pollutants can adversely impact bodies of water that receive stormwater runoff. Potential water quality concerns resulting from stormwater include:

- **Beach closures** and potential illness from bacteria or viruses in sanitary wastes or pet and wildlife fecal matter.
- **Nuisance/Toxic algal growth** in lakes and streams from excess nitrogen and phosphorous compounds.
- **Elimination of suitable fish and macroinvertebrate habitats** in streams and lakes due to sedimentation and turbidity.
- **Toxicity** from ammonia, salts, metals, organic compounds, pesticides and other contaminants.
- **Oxygen depletion** of the water from excess biodegradable organic material, which can lower oxygen levels enough to kill fish and other organisms living in the water.
- Surface water **temperature changes** due to an influx of water warmed by the 'heat island' effect of roads and buildings. Warm water holds less dissolved oxygen than cold water and can reduce oxygen levels in streams. Temperature changes can severely disrupt certain aquatic species, such as trout and stoneflies, which can survive only within a narrow temperature range.
- **Contamination of ground water** with salts, nitrates, metals, organic compounds, and other contaminants
- **Aesthetic impacts** from floating materials and sediments (e.g., litter, grass clippings, sanitary items, and soil erosion).

In order to address the impacts of development on water quality, the CCWMO has developed water quality standards for stormwater design. Water Resource Management Standards are included in Carver County Ordinance Title XV, Chapter 153. The CCWMO's goal is to manage runoff from development by utilizing BMPs or low impact development to treat stormwater runoff before it reaches receiving waters. The ordinance includes standards for erosion and sediment control, water quality ponding, and filtration/infiltration. See Sections 3.2.1 – 3.2.3 for additional information.

Section 303(d) of the Clean Water Act requires states to publish and update a list of waters that are not meeting one or more water quality standards. The MPCA updates the 3039d) TMDL list every two years; waters on this list are considered impaired. The CCWMO address surface water quality impairments through its Total Maximum Daily Load (TMDL) program which develops TMDL studies and implementation plans. TMDL studies and implementation plans are submitted to the MPCA and EPA for review and approval. See Chapter 3B: Impaired Waters and TMDL Approach for additional information.

3.2.1 Erosion and Sediment Control

The CCWMO has adopted by reference the erosion and sediment control design and operational standards as set forth in the NPDES general permit. The Carver SWCD through inspections has contact with contractors, government units, and the MPCA and building inspectors regarding compliance with the standards. Before approval, the SWPPP plan review is coordinated between CCWMO and the SCWD. The following topics are addressed in County ordinance, which is designed to be consistent with the NPDES requirements; Implementation of the NPDES standards and permit requirements, coupled with education, offer communities an opportunity to create meaningful plans and rules to protect water resources in their jurisdictions.

- Storm Water Pollution Prevention Plan
- Temporary Sediment Basins
- Erosion Prevention Practices
- Sediment Control Practices
- Dewatering and Basin Draining
- Inspections and Maintenance
- Pollution Prevention Management Measures
- Final Stabilization

3.2.2 Water Quality Ponding

Design criteria for new development will be based upon National Urban Runoff Program (NURP) standards. Using a well accepted model (PondNET by Walker) this NURP wet volume provides approximately 60% removal of phosphorus through sedimentation and biological uptake (algae) and settling. Wet ponding is a proven BMP and is low cost since the pond area is required for flood storage (live storage). Many sites have used the temporary sedimentation pond as the final wet pond BMP thereby localizing the disturbance of the parcel. Stormwater ponds will require occasional dredging to maintain the wet volume.

3.2.3 Infiltration and Filtration

Infiltration and filtration are stormwater management techniques that have a variety of benefits. Infiltration provides water quality benefits *and* volume reduction but requires permeable soils. Filtration provides water quality treatment, plant uptake, extended base flows, and can be utilized on sites with a wide variety of soil types. Appendix A summarizes the available infiltration information for Carver County (surficial geology, concept level infiltration rates). The County geology (and history of permit applications) shows that infiltration opportunities are uncommon therefore applicants have selected filtration as the BMP to meet the ordinance. Filtration is a low cost method for linear projects to incorporate treatment (i.e. road ditches) where wet ponds are not feasible due to safety concerns or lack of right-of-way. The filtration sites can be distributed throughout the site and placement adjacent to impervious provides direct treatment of impervious runoff.

Standards for infiltration and filtration will be updated when CCWMO Rules are revised following the adoption of this plan. In developing the standards, it is the intention of the CCWMO to create a flexible approach to BMP selection that allows a stormwater manager to select those BMPs most appropriate for a site. The following considerations will be incorporated when the infiltration/filtration standards are updated:

1. The type of **land altering activity** (new construction vs. redevelopment);

2. **Proposed land use** (linear, industrial, commercial, residential, etc.)

3. The **volume treated is calculated from the impervious surface** (not total site area).

4. The **design storm event will range from 0.50 to 1.0 inch** over the site's impervious surface.

    a. A treatment design event of 1.0-inch will manage approximately 90% of rain events, which is 65% of the annual volume off the impervious. This 1.0-inch event also accounts for 55% of the annual TSS load and 70% of the TP load.
    b. The 0.50 inch event is consistent with the NPDES Construction Permit requirements[1]. A design event of 0.5 inches treats 32% of the annual volume, 18% of the annual TSS load and 38% of the TP load. The analytical comparison shows that the 1.0 inch event treats significantly more of annual pollutant loads (18% vs. 55% for TSS) and 38% vs. 70% for TP, however does increase the required volume.
    c. Note: CCWMO TMDL reduction goals range from 53% - 99% for TSS and 50% - 90% for TP.
    d. Designs utilized to date in Carver County show that although the volume triples (0.3 to 1.0 inch design storm) the volume is incorporated within the site at a lesser ratio. For example a pond shelf would need minimal increase to meet the 1.0 requirement. A stand-alone rain garden would need larger area, or multiple areas to meet the requirement. Increasing depth of water in a rain-garden would lessen the area needed, however viability of vegetation under increased depth should also be considered.
    e. Based on past project reviews, this increase to 0.5 or 1.0 inch design storm will not reduce developable land for the vast majority of sites in the CCWMO, will increase water quality leaving the site, extend the base flow over several days, reduce volume, and provide opportunity for vegetated treatment areas.

5. **Alternative methods of treatment** may be allowed if it can be demonstrated that they provide treatment equivalent to that provided by infiltration/filtration.

6. Stormwater management should not result in the discharge of any regulated substance, hazardous or biological waste, or petroleum product, whether treated or untreated, to best management practice devices that may have a deleterious effect upon a water of the state (surface and groundwater), unless the discharge is in compliance with Federal, State, and local regulations.

3.3. Floodplain Alteration

Floodplains naturally serve to reduce the severity of flooding within the watershed. The reduction of floodplain volume as a result of development and/or improper management can contribute to high water levels as well as pose a risk to property and public safety. Proposed reductions in floodplain volume are allowable only if they do not cause a net decrease in flood storage capacity below the projected 100-year flood elevation or unless it is shown that the proposed filling will not cause high water or aggravate flooding on other properties and will not unduly restrict flood flows. The allowable fill area shall be calculated by a professional engineer registered in the State of Minnesota. If a decrease in flood storage is demonstrated, the lost volume must be replaced. Local ordinances will have to be updated to reflect any CCWMO Rules that are revised as a result of this Plan.

[1] As indicated in the current NPDES general permit, for projects within 1 mile of an impaired water, the water quality volume that must be treated by the project's permanent stormwater management system shall be one (1) inch of runoff from the new impervious surfaces created by the project. Where site conditions allow, at least ½ inch of the water quality volume must be infiltrated.

3.4 Creek and Stream Protection

Stream channel enlargement significantly impacts stream habitat, water quality and public infrastructure. As noted previously, when fields and forests are converted to impervious surfaces, the volume and frequency of runoff increases significantly. Research indicates that urbanization causes channels to expand two to ten times their original size to adjust to the increased volume and frequency of runoff caused by impervious cover as well as the increased conveyance efficiency of curbs gutters and storm drains.

Historically, the two-year peak discharge control has been widely applied to control channel erosion, but recent research indicates that the two-year peak discharge control does not protect channels from downstream erosion and may actually contribute to erosion since banks are exposed to erosive bankfull and sub-bankful events for a longer period of time.

To protect receiving channels, extended detention of 24 hours should be provided for the runoff generated from the 1-year 24-hour storm of 2.3 inches for direct discharges to natural streams. The runoff volume generated is stored and gradually released over a 24 hour period so that critical erosive velocities in downstream channels are not exceeded over the entire storm hydrograph.

4. OTHER STRATEGIES & PRACTICES

4.1 Minimize Impacts to Natural Resources

Natural areas provide important stormwater management benefits and alleviate runoff impacts:

- Natural areas like forests and woodlands intercept rainfall as it falls, **reducing the overall amount of rainfall that reaches the earth's surface and runs off the landscape**.
- Maintaining natural vegetation on bluff lands and steep slopes can **reduce erosion** and help **maintain slope stability**.
- Wetlands and other low-lying areas are **natural storage areas**.
- Maintaining natural vegetation in riparian areas adjacent to water bodies and wetlands can **reduce flooding risks** and act as buffers, **filtering stormwater** before it reaches the water body.

Minimizing disturbances and alterations to these areas can reduce the volume of stormwater leaving a development site and reduce the need for engineered solutions to address stormwater management issues. To help identify significant natural features, Carver County developed a natural resources assessment that inventories and ranks remaining natural areas in the county. See Chapter 2: Land and Water Resource Inventory and Chapter 3G: Upland Natural Resources for additional information.

4.2 Regional Storage Strategy

The CCWMO will work with the cities to plan for flood storage and/or water treatment to encourage regional ponds, reduce maintenance, and enhance overall storage capacity for the watershed. The CCWMO will cooperate with the cities to implement the regional ponding element in conjunction with the local stormwater plans. Each city is responsible for the modeling and development of their local stormwater system for the current developed area and its 2030 development area.

Wetland restoration offers another way to increase the amount of storage in the watershed. Restored wetlands can serve several purposes including habitat and water quality improvement as well as addressing stormwater quantity in conjunction with regional ponding and other BMPs. As part of the Wetland Functional Value Assessment, potential wetland restoration sites were identified. In order to maximize the benefits associated with wetland restoration, the CCWMO will prioritize wetland restoration opportunities based on several criteria, including the regional storage provided by the restored wetland (please see the Wetland Management Chapter for additional information.)

4.3 Public Sector Practices for Roadways

The County's roads, highways, and bridges can be a source of a significant amount of pollution to water resources. Pollution is generated during road construction, maintenance, and use. Non-point source pollution, or runoff pollution, is created when chemicals, debris, fertilizers, automotive oils, salt brine, debris from wearing parts, and litter are washed off roadways and bridges during rainstorms and carried as runoff to nearby water bodies. During winter, salt and winter sand stockpiles and truck wash operations can generate chemical pollution. A good approach to these problems is to prevent the formation of salt brine, which is formed when deicing chemicals and water come in contact with each other. Due to the chemical characteristics of salt in solution, salt will not settle or filter out, and therefore, salt in solution (salt brine) has to be confined, collected, and disposed of properly. Nearby vegetated areas and waterbodies can be damaged by salt brine, construction sedimentation, and other pollutants generated from road maintenance decreasing the water quality benefits that they normally provide. With proper planning in design, construction, and maintenance BMPs will help reduce the volume and concentration of pollutant loads. Below is a list of practices associated with general maintenance, snow and ice control, and road cleaning and debris removal that applies most directly to county, township, and city roads and ponds in Carver County:

- Develop an inspection program and schedule to ensure that general maintenance is performed. Inspect erosion and sediment control devices regularly.
- Maintain retaining walls and pavements to minimize cracks and leakage.
- Repair potholes
- Maintain energy dissipaters and velocity controls to minimize runoff velocity and erosion.
- Properly dispose of accumulated sediment collected from detention ponds, drainage systems, and pollution control structures, and any wastes generated during maintenance operations, in accordance with appropriate local, state, and federal regulations.
- Use techniques such as suspended tarps, vacuums, or booms to prevent paint, solvents, and scrapings from becoming pollutants during bridge maintenance.

- When blading gravel roads, take care to maintain a structurally sound surface while providing an adequate crown and drainage so that erosion or scattering of gravel are avoided.
- Develop an infrastructure safety inspection program in conjunction with general maintenance.
- Keep drainage ditches free of unnecessary debris.
- Cover salt storage piles and other deicing materials to reduce contamination of surface waters. Locate them outside the 100-year floodplain.
- Regulate the application of deicing salts to prevent over-salting the pavement.
- Use trucks equipped with salt spreading calibration devices.
- Use alternative deicing materials, such as sand or salt substitutes, where sensitive ecosystems should be protected.
- Prevent dumping of accumulated snow into surface waters or onto frozen water bodies.
- Seed and fertilize, seed and mulch, and /or sod damaged vegetated areas and slopes.
- Establish a pesticide and nutrient management program that restricts the use as much as possible.
- Promote native flower and grass plantings within buffer strips around ponds and along ditches.
- Sweep, vacuum, and wash residential streets and parking lots at least twice per year. In the spring after the snow melts and in the fall after the leaves have dropped.
- Collect and remove road debris.
- Encourage litter and debris control management in-house and through adopt-a-highway type programs.

4.4 Urban Land Use Practices

Everyone, from private citizens to elected officials, shares a watershed with its own unique set of water quality and water quantity issues. This Plan is the effort of individuals within a common geographic area (the CCWMO) helping to make decisions based on all the water resources, all the water uses, and all the threats to water quality within the watershed. Almost every human activity including transportation, industrial operations, lawn care, farm management, land use, flood prevention, waste management, and even recreation, affects the quantity and quality of water within a watershed. The watershed planning approach considers pollution and excess runoff from all these sources and evaluates its impact on the total watershed environment.

Every acre of land in the watershed, if managed properly, contributes to the solution to water quality and water quantity issues within a watershed. One of the best places for citizens to get started is their own backyard, because every piece of land managed properly contributes to the solution. Care of the land is in the hands of those who live and work on it. No matter what type of property you own or manage there are practical land use applications that will help contribute to the sustainability and improvement of the water resources in the watershed.

The following is a list of practices that landowners can utilize to help reduce the impacts of urban development on water resources. The CCWMO and LGUs should promote and provide incentives to help landowners implement these practices.

- Keep a healthy lawn.
- Plant and maintain grass and natural vegetation to help water quality by soaking up rainfall, reducing runoff, and retaining sediment.
- Install rain gardens to capture and treat stormwater runoff from your house or lawn.
- Restore shorelines to stabilize shorelines, protect water quality, and provide wildlife habitat.
- Purchase a rain barrel to capture rain water from your rooftop.
- Purchase a compost bin and compost leaves and lawn clippings.
- In order to properly apply only the amount of fertilizer needed, test your soil for nutrients.
- Use zero phosphorus fertilizer and keep fertilizer off hard surfaces (i.e. driveways, sidewalks, streets) by sweeping up after fertilization is complete.
- Keep your leaves and lawn clippings out of the streets and gutters because the streets and storm sewer lead to the nearest water body.
- Pick up your pet's wastes.
- Limit use of herbicides and pesticides by using alternative, less harmful pesticide management options.
- To keep soaps from running off into lakes and streams, wash cars and other items on a pervious surface.
- Eliminate disposal of any household product into the storm sewer.
- Keep your neighborhood free of litter/debris.

5. URBAN STORMWATER MANAGEMENT GOAL

Goal USM-1 Minimize and mitigate the impacts of urban stormwater runoff on water resources.

6. URBAN STORMWATER MANAGEMENT POLICIES

Policy USM-1 Develop and apply regulatory standards that help the CCWMO meet its goals.

Policy USM-2 Ensure compliance with CCWMO regulatory standards through permitting, monitoring, and enforcement.

Policy USM-3 Encourage innovation in meeting CCWMO standards by building flexibility and incentives into CCWMO rules.

Policy USM-4 Continue to meet or exceed federal and state requirements for stormwater runoff.

Policy USM-5 Establish a capital improvement program and cost share program to provide funding for priority stormwater projects and for landowner Best Management Practices.

Policy USM-6 Pursue outside funding opportunities including state, federal, non-profit, and other grants to accelerate implementation of stormwater BMP's

Policy USM-7 Promote education about the benefits associated with the proper management of urban stormwater runoff.

Policy USM-8 Provide landowners with the technical knowledge to properly manage urban stormwater runoff on their own property.

Policy USM-9 Utilize existing studies (Total Daily Maximum Load Studies and Implementation Plans, Local Plans, and other studies) to prioritize project implementation.

Policy USM-10 Track and evaluate progress towards the goals, policies, and implementation strategies described in this plan.

7. URBAN STORMWATER MANAGEMENT IMPLEMENTATION

Imp Strategy USM-1 Continue to operate the Water Management Permit Program and apply existing CCWMO Rules until they are amended following the adoption of this plan. The CCWMO Rules will be amended to include the standards described in this plan for rate control, volume control, water quality treatment, floodplain impacts, natural resource impacts, and erosion and sediment control. The rules will allow for flexibility and innovation in meeting the standards.

Imp Strategy USM-2 Cities are required to prepare a local water management (local) plan that conforms with the CCWMO Plan. The CCWMO is required to review and approve each local plan. More information about local plan requirements can be found in the Administration Chapter.

a. Cities are required to prepare or amend their local water management plans and ordinances to be consistent with the CCWMO Plan within two years of the date of this plan's approval by the BWSR Board. The CCWMO will consider alternative local plan amendment and update schedule requests from LGUs and will try to be flexible on due dates to accommodate the update schedules of other WMOs when LGUs are within the jurisdiction of more than one WMO.
b. City local water management plans are required meet Metropolitan Council and applicable state statute requirements.
c. Cities should seek input and assistance from the CCWMO during the preparation of the local plan.

Imp Strategy USM-3 Follow and incorporate Total Maximum Daily Load Studies and Implementation Plans.

Imp Strategy USM-4 Continue to meet or exceed the NPDES Phase II MS4 requirements that apply to the CCWMO stormwater system.

Imp Strategy USM-5 Collaborate with other LGUs to help them implement their NPDES Phase II MS4 requirements and to minimize duplication and increase efficiency.

Imp Strategy USM-6 Establish a capital improvement program and cost share program to provide funding for priority stormwater projects and for landowner Best Management Practices.

Imp Strategy USM-7 Prioritize stormwater retrofit projects and regional ponding projects using Total Maximum Daily Load Studies and Implementation Plans, Local Surface Water Management Plans, and other studies.

Imp Strategy USM-8 Work with Carver County Public Works to develop and adopt a road maintenance and operation plan using the practices described in this section. Carver County Public Works would be responsible for implementation of the Plan.

Imp Strategy USM-9 Provide technical assistance to both private and public landowners on stormwater management and the BMPs described in this plan.

Imp Strategy USM-10 Continue to provide necessary resources for implementation of the Water Management Permit Program, Stormwater Design Standards, and Erosion & Sediment Control Standards. The CCWMO will continue to employ staff or a consultant to perform the following tasks:

a. Review Water Management Applications (including stormwater design standards and erosion and sediment control plans)
b. Inspect BMP installations
c. Monitor sites as recommended by the water plan; and
d. Enforce maintenance through procedures in the water resource management ordinance.

Imp Strategy USM-11 Continue to monitor construction activities and resolve sediment and erosion problems if and when they arise.

Imp Strategy USM-12 Evaluate Water Plan policy and implementation effectiveness as part of the CCWMO annual report.

Imp Strategy USM-13 Develop a list of priority subwatersheds based on watershed susceptibility to water quality degradation, water quantity impacts, streambank erosion, wildlife habitat, recreation, and aesthetic impacts from urban and rural practices. The list of priority subwatershed will be used to focus project implementation in high priority watersheds to reduce impacts of impervious development.

Imp Strategy USM-14 Develop and maintain a database for stormwater related data, such as the location and type of stormwater infrastructure.

Imp Strategy USM-15 Continue to monitor stormwater management BMPs to provide information on their effectiveness.