Major Resource Management Programs

This overview provides a summary of major programs for resource management efforts which affect the CCWD or activities within its jurisdiction.

It is not intended to be a comprehensive or exhaustive presentation, but rather a snapshot of programs that are relevant to and thus impact the District.

Impaired Waters Program

Overview

Section 303(d) of the federal Clean Water Act requires states to identify waters that do not meet applicable water quality standards or do not fully support their designated uses. Waters failing to attain their designated use are defined as impaired. Each state determines the cause for impairment.

Impaired waters are placed on a list and subject to completion of a Total Maximum Daily Load (TMDL) analysis. A TMDL analysis consists of many steps, but the process is intended to identify ways to restore impaired waters to their full beneficial uses. The implementation of load reduction efforts identified in a TMDL analysis may have future bearing on other activities of the CCWD.

There are multiple stream systems and lakes within the boundaries of the CCWD which are on the 303(d) impaired waters list. These water resources are listed in Table 4-1 and Table 4-2 and displayed in Figure 4-1.

Roles and Responsibilities

MPCA

The MPCA is required to submit a prioritized list of impaired waters, known as the 303(d) list, to the EPA for review and approval every other year. The most recent list was approved in 2008, with a new draft version available, which is scheduled for approval in 2010. TMDL plans must be approved by the MPCA before the EPA provides final approval. The MPCA also provides financial assistance through Clean Water Partnership and Clean Water Act Section 319 programs. These programs address nonpoint source pollution issues and are often used for TMDL projects. Funding also may be available through the Clean Water Legacy Act, which also is managed by the MPCA.

CCWD	For impaired waters within the CCWD boundary, the District may choose to lead a TMDL analysis. The CCWD believes that performing load assessments, studies, or similar analyses is a key role of the District, However, implementation is primarily believed to be a shared responsibility with member cities and other program partners.
Cities	Cities or townships may choose to take initiative to lead a TMDL analysis for water bodies with drainage areas solely (or majority) in their municipality. It is preferable that local government units and the CCWD coordinate so as not to perform duplicate TMDL analyses for the same receiving water. Local government units that are within drainage areas that have an approved TMDL plan will be required to comply with load reductions through the enforcement of various point source and non-point source permits.
Other Entities	Other groups such as the counties or lake associations can take their own initiative to complete a TMDL analysis, undertake implementation of TMDL load reduction practices, or participate in the TMDL process as stakeholders

National Pollutant Discharge Elimination System Program

Overview

The National Pollution Discharge Elimination System Program (NPDES) is a nation-wide federal regulatory program stemming from the Clean Water Act. In Minnesota, this program is implemented by the MPCA. The NPDES program addresses point source discharges including stormwater and related pollution from various sources. The Phase I of the stormwater NPDES program focused on controlling pollution from industrial activities, and included construction activities disturbing more than 5 acres, and municipal separate storm sewer systems (MS4s) with populations greater than 100,000

The Phase II of the NPDES program was preliminarily initiated by the MPCA in 2003 and formalized in 2006. It builds on Phase I by lowering the threshold for requiring stormwater permits for construction and municipal activities. The basis of the program is for permittees to complete a Storm Water Pollution Prevention Program (SWPPP). In all cases, Best Management Practices (BMPs) are to be identified and implemented in order to minimize stormwater runoff impacts to receiving waters. Minnesota Rule Chapter 7090 became effective August 15, 2005. This rule emulate the national laws already in effect and address concerns associated with stormwater discharges from regulated municipal, industrial and construction activities in Minnesota.

Roles and Responsibilities

The District is a regulated MS4 permittee. Typically, the District is not a construction site Owner or Operator. However, the CCWD may choose to participate in these programs by assisting affected parties.

MPCA

Administers all three components of NPDES Phase II

CCWD

Must comply with the MS4 program because the District is identified under the auspices of the permit requirements.

The District may also choose to support cities and other local government units in their MS4 compliance efforts by providing educational materials (considered a BMP) or otherwise partnering, such as with construction site

	erosion control inspections or establishing design guidance for stormwater management. The District administers a construction site inspection program and enforces erosion and sediment control requirements.
Cities	Cities wholly or partially in the urbanized area which own or operate an MS4 are all mandatory permittees. This includes • Andover • Blaine • Coon Rapids • Fridley • Ham Lake Additionally, Andover, Blaine, and Coon Rapids must comply with the MS4 Permit's non-degradation rule. They must perform a loading assessment to evaluate nonpoint source impacts to receiving water since 1988. They must demonstrate on-going or new ways to reduce current and future loads and runoff volumes to 1988 levels.
Anoka County	Will be obligated to meet the same general SWPPP requirements (excluding nondegradation).
Minnesota Department of Transportation	Will be obligated to meet the same general SWPPP requirements (excluding non-degradation).

Wetland Conservation Act

Overview

Minnesota Rule 8420, the Wetland Conservation Act (WCA) was enacted in 1991. The overall goal of WCA is no net loss of wetlands.

Generally under WCA, activities such as draining, excavating, or filling of wetlands is regulated by law. WCA does not apply to public waters wetlands, which are regulated by the MnDNR. The local government unit (LGU) has the primary responsibility for administering WCA and for making key determinations.

The CCWD is the LGU for four of the five cities currently within the watershed. They are

- Andover
- Blaine
- Columbus
- Ham Lake

Roles and Responsibilities

BWSR the WCA through promulgation of rules and guiding the implementation

CCWD The District is the LGU for wetlands within the watershed, except for within the City of Coon Rapids

Cities The City of Coon Rapids retains the LGU authority for the WCA program. All cities within the watershed must conform to the wetland standards set forth by the CCWD.

Anoka Conservation District Representatives of conservation district agencies for each county participate in the Technical Evaluation Panel.

MPCA NPDES permits for discharges to wetlands must be submitted to MPCA. This agency is responsible for administering Minnesota Rule Chapter 7050 (water quality standards) which include wetlands as specified in Minnesota Rule 7050.0210, subpart 13a.

Army Corps of Engineers Section 404 of the Clean Water Act gives the Corps jurisdiction over regulating impacts to wetlands and navigable waters. The Corps issues federal permits for all

	proposed wetland disturbances
Minnesota Department of Transportation	The Department of Transportation is the WCA LGU on all of its projects. There are various agencies involved in the permitting process for wetland disturbances. In Minnesota, a joint application process has been established to streamline the agency review and permitting process. Proposed activities which affect a wetland cannot begin until all agencies authorize a project. Often, Technical Evaluation Panels are convened as a mechanism to resolve permitting issues relating to wetland impacts.

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Surface Water Management Planning

Overview

The Metropolitan Surface Water Management (MSWM) Act was enacted in 1982 to require planning for surface water management throughout the seven-county metropolitan area. The MSWM Act is enforced by Minnesota Statutes 103B.201 to 103B.251 and later, Minnesota Rule 8410. Watershed districts are established and given further authority under the Minnesota Watershed Act (Minnesota Statute 103D) and therefore must conform with the requirements therein. These rules provide the framework for governing surface water management (including wetlands) at the local and regional level.

Roles and Responsibilities

BWSR

Responsible for reviewing and approving the WMP based on Minnesota Rule 8410. Metropolitan Council: The Council reviews and comments on the watershed plan with respect to its consistency with state laws and rules relating to water and related land resources.

CCWD

The role or focus of a district in surface water management varies depending on the specific water issues. The CCWD is responsible for periodically updating their plan and complying with the regulations referenced above. This WMP, and its contents, is in compliance with the requirements

Cities

Within two years of this WMP adoption by the District, local government units are required to adopt local plans which address the regulations and performance standards set forth in this plan. Local plans must be consistent with the District WMP covering the same area. Local plans should address the expanded list of requirements under Minnesota Rule 8410 as set by the Metropolitan Council's "2030 Regional Development Framework.

Anoka Conservation District

Review and comment on the plan. County water plans must be consistent with the District plan covering the same area. State review agencies: Review and comment on plan. Involved state agencies include the MnDNR, MPCA, Department of Health, Department of Agriculture,

	and the MnDOT.
Other WMOs	District policies and programs are to be consistent with the adjacent Rice Creek Watershed District and Sunrise River, Upper Rum River and Lower Rum river Water Management Organizations.

Groundwater Planning

Overview

The EPA is responsible for federal activities relating to the quality of groundwater, especially as it relates to drinking-water supplies. Groundwater protection activities by the EPA are authorized by a number of federal laws which focus on controlling potential sources of groundwater impacts. Where federal laws have provided for general groundwater protection activities, the actual implementation of these programs is administered by the states in cooperation with local governments. In Minnesota, several state agencies are involved in administering programs which regulate water supply wells and monitoring of groundwater resources in order to maintain the quality of groundwater supplies for the benefit of the public and the environment.

Groundwater planning done as part of water supply plans and wellhead protection plans is reviewed and approved by Minnesota regulatory agencies. States are also charged with preventing pollution of groundwater by establishing appropriate rules and issuing permits for waste treatment, storage, and disposal activities, as well as performing compliance reviews.

Roles and Responsibilities

CCWD

The District recognizes the important relationship between surface water and groundwater resources. The District can collaborate with the other units of government and may choose to help fund groundwater projects which have a connection to surface water issues. The CCWD is responsible for conforming with groundwater plans developed by relevant Counties.

Note that Anoka does not.have a plan but does perform an assessment The District will review and submit comments to the MnDNR for water appropriation permits." Counties: As directed by Minnesota Statute 103B.255, counties may prepare a plan which provides a county-wide framework for the protection and conservation of groundwater resources.

Cities

Install water supply systems and are required to comply

	with the rules and regulations established by state agencies and county governments regarding groundwater protection and uses in compliance with the Safe Drinking Water Act. Responsible for developing wellhead protection plans pursuant to MDH rules.
Minnesota Department of Health (MDH):	Primary role is maintaining a safe drinking water supply. The MDH issues permits for all new wells to be installed and oversees water quality monitoring for all public water supply systems. MDH administers the state wellhead protection program according to Minnesota Rules (Chapter 4720.5100 - 4720.5590), which sets standards for wellhead protection planning. Through this program, MDH approves drinking water supply management areas (DWSMAs) which includes surface and subsurface area surrounding a public water supply well.
Minnesota Pollution Control Agency (MPCA):	Responsible for establishing groundwater quality standards, usually based on health risk limits set by the MDH. The MPCA is also responsible for working with the MDH and MDA to establish an ambient groundwater quality monitoring network in Minnesota.
Minnesota Department of Natural Resources (MnDNR):	Charged with managing the State's ground water supply sustainability by conducting studies of ground water availability and supply; conducting studies of ground water and surface water interaction, administering a water use permitting program, and reviewing/approving municipal water supply plans.
Minnesota Department of Agriculture	Is charged by law with regulating pesticides, including monitoring for them in the environment and preventing pesticides from getting into water.
EPA	Under the EPA's Office of Ground Water and Drinking Water, underground injection wells are regulated through the Underground Injection Control program. This relates to groundwater planning at a local level because some stormwater infiltration systems can be considered Class V injection wells
Metropolitan Council	Charged with developing a metropolitan area master water supply plan

Overview of Water Resource Protection

Each state determines which beneficial uses are appropriate for their waters. The uses specify the value of a particular water body in the sense of how society will utilize them and their societal benefits. The best uses for a water body are those determined to be most consistent with the present and potential uses, while considering the economic and social development within an area. The level of water quality improvement or degree of protection necessary to achieve the uses occurs through the establishment and enforcement of water quality standards. Whether a use is being attained is evaluated based upon the physical, chemical and biological characteristics of the water body.

Minnesota Rule 7050 identifies seven use classes describing the beneficial uses for which surface waters are protected. All surface waters in Minnesota, including lakes, rivers, streams and wetlands are protected for aquatic life and recreation where these uses are attainable, unless the waterbody has been individually reassessed and re-classified as limited resource value water. Limited resource value waters include surface waters that have been subject to a use attainability analysis and have been found to have limited value as a water resource because of lack of water, lack of habitat, or extensive physical alterations

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There are three types of standards used to establish a regulatory limit that supports a designated use;

Type	
Numeric Standard	A numeric standard represents a designated safe concentration for a particular contaminant intended to protect a designated use. The use will be adversely affected if the pollutant concentration exceeds the numeric standard too frequently. Numeric criteria, which form the basis for standards adopted by many states, are defined in federal rules as a recommended minimum water quality standard. A state can establish a more restrictive standard than the numeric criteria.
Narrative	The narrative standard is usually not as easily defined as a numeric standard. Narrative standards involve keeping waters free of unwanted conditions such as oil sheens, floating solids, or algae blooms. The narrative standard may also be interpreted as the physical condition necessary to achieve the designated use. For example, if the designated beneficial use is “cold water fish habitat” the surface water temperature and dissolved oxygen levels must remain within a range that can support cold water fish species.
Nondegradation	The nondegradation standard pertains to waters that currently have water quality better than the applicable

numeric or narrative standards, for the designated use. The anti-degradation standard precludes further degradation of the resource to the numeric standard. It essentially does not allow the polluting of a better quality resource from its current condition "back" to the level of the lower-quality numeric standard for the designated use.

Within this broad context of resource management, under Minnesota Rule 8410.0100, Subpart 3A, the CCWD can establish local goals for lake nutrient concentrations and corresponding pollutant loadings.

Subpart 6: Management Programs of Minnesota Rule 8410.0100, states that 'each [watershed management organization] plan must, at a minimum, assess or require local plans to assess [E] the need to establish a water body management classification system to provide for water quality and quantity management based on a hierarchical basis.

Subpart 6 further states that 'All proposed management programs establishing a classification system for the management of water bodies shall be consistent with chapter 7050', which describes water-quality standards for protection of waters of the state and their classifications.

Lake Classification and Management

State-wide Classification System

One of the most basic and broadly used lake classification systems in Minnesota is employed by the MPCA using eco-regions as the primary baseline. Eco-regions are discussed in Chapter 2 of this plan. Omernik (2004) describes an eco-region as a "recurring pattern of ecosystems associated with characteristic combinations of soil and landform that characterize that region". The MPCA developed eco-region-based lake eutrophication standards for the concentrations of total phosphorus (TP) allowed in those waters.

These are used as part of an overall "weight of evidence" approach to assess whether lakes support swimmable and other uses, and other factors related to the TMDL support for lakes discussed elsewhere.

Minnesota includes four eco-regions shown in the following table, which also further details the use and level of support and the TP guideline:

Table Eco-region-based lake-eutrophication standards

Eco-Region	**Use and Level of Support**	**TP Guideline**	**Shallow Lake**
Northern Lakes and Forests	Cold water fishery, Full support	< 15 µg/liter	
Northern Lakes and Forests	Primary-contact recreation and aesthetics, Full support	< 30 µg/liter	
North Central Sand Forests	Primary-contact recreation and aesthetics, Full support	< 40 µg/liter	< 60 µg/liter
Western Corn Belt Plains and Northern Glaciated Plains	Primary-contact recreation and aesthetics, Full support	< 40 µg/liter	< 90 µg/liter
	Partial support	< 90 µg/liter	

The following descriptions detail the use and level of support:

- Full-support - few algal blooms and adequately high transparency that exist throughout summer to support swimming.

- Partial support (impaired) - algal blooms and low transparency that may limit swimming for a significant portion of the summer.

- Non-support (impaired) - severe and frequent algal blooms and low transparency that will limit swimming for most of the summer.

The CCWD is entirely within the North Central Sand Forest Eco-region, but has climate and land use similar to the Western Corn Belt Plains Eco-region. It also has many shallow lakes that affect the relation between phosphorus and the ecosystem of the lake.

The MPCA generally classifies water as wetlands if it is less than 7-feet deep, for shallow lakes, if it is 7-15 feet deep and deep lakes if it is greater than 15-feet as. A variety of other factors complicate this relation, but the primary reasoning is that wetlands have considerable emergent and submergent vegetation that makes them a different ecosystem than shallow and deep lakes, while lakes have a considerable amount of open water.

Deep lakes differ from shallow lakes because they generally thermally stratify in the summer, which keeps nutrients such as phosphorus in the cooler bottom (hypolimnetic) waters where they are unavailable to over fertilize aquatic plant communities.

The effect of wind action on mixing is controlled somewhat by the lake's fetch, which is the length of the lake that is affected by strong winds. Shallow lakes having a smaller fetch may hold stratification longer than lakes having a large fetch. Conversely, deeper lakes might mix more frequently if they have a larger fetch. Deeper lakes and some shallow lakes generally are capable of supporting a sustainable a fish population, making them popular to those types of recreational activities.

Table shows the characteristics of lakes, shallow lakes, and wetlands provided by the MPCA.

	Lakes	**Shallow Lakes**	**Wetlands**
Protected Waters Inventory Code	Typically coded as "L or LP in PWI	May be coded as either "L, LP or LW" in PWI	Typically coded as a "LW" in PWI
Depth, Maximum	Typically > 15 feet	Typically < 15 feet	Typically < 7 feet
Littoral area	Typically < 80 %	Typically > 80 %	Typically 100%
Area (minimum)	> 10 acres (Bulletin 25) 2	> 10 acres (Bulletin 25)	No minimum
Thermal Stratification (Summer)	May or may not stratify dependent upon depth, size and fetch of lake	Typically do not thermally stratify	Typically do not thermally stratify
Fetch	Frequently a significant fetch depending on size	Fetch is highly variable	Rarely has a significant fetch
Substrate	Consolidated sand/ silt/gravel	Consolidated to mucky	Mucky to unconsolidated

	Lakes	Shallow Lakes	Wetlands
Shoreline features	Generally wave formed, often sand gravel or rock	Generally wave formed, often sand gravel or rock	Generally dominated by emergents
Emergent vegetation	Shoreline may have ring of emergents	Emergents common, may cover much of lake	Emergents may dominate much of basin often minimal open water
Submergent vegetation	Shoreline may have ring of emergents	Emergents common, may cover much of lake	Emergents may dominate much of basin, often minimal open water
Dissolved Oxygen	Aerobic epilimnion; hypolimnion often anoxic by midsummer	Aerobic epilimnion but wide diurnal flux possible	Diurnal flux and anaerobic conditions common
Fishery	Typically managed for a sport/game fishery. May be stocked MN/DNR fishery assessments typically available	May or may not be managed for a sport fishery. If so, fishery assessment should be available. Winter aeration often used to minimize winterkill potential	Typically not managed for a sport fishery. Little or no MN/DNR fishery information. Seldom aerated. May be managed to remove fish and promote waterfowl
Uses	Wide range of uses including boating, swimming, skiing, fishing; boat ramps and beaches common	Boating, fishing, waterfowl production, hunting, aesthetics; limited swimming; may have boat ramp, beaches uncommon	Waterfowl and wildlife production, hunting, aesthetics. Unimproved boat ramp if any. No beaches

CCWD Classification System

Discussion of Classification Factors

Twelve lakes were considered while developing this classification system.

Three lakes were less than 7-feet deep and would be classified as wetlands.

Three lakes had depths that would make them shallow lakes.

Five lakes have depths greater than 15 feet making them deep lakes. However, two of these are man-made and the other three have more characteristics of a shallow lake than a deep lake

Four lakes had no depth information readily available.

For this plan, the classification system takes into account qualitative and quantitative factors. These factors often are interdependent, such as the appearance or clarity of water that is measured numerically as transparency. There are also factors that indicate the public importance of a water body: a public boat launch indicates the desire of nearby residents wanting or needing boat access; and that desire often is to go fishing, which has other management implications. These factors are discussed further in order to summarize the range in lake characteristics within the watershed.

Lake Name	Nature	Lake ID	Size (Ac)	Littoral Zone (%)	Max Depth (ft)	Water Clarity (ft)
Amelia	Man Made		10			
Bunker	Wetland	020090	70	100%	6	
Cenaiko	Man Made	020654	29	40%	36	5.4
Club West	Man Made	020764	37		26	3.5
Crooked	Shallow	020084	118	73%	26	8.5
Dianne	Man Made		14			
Ham	Shallow	020053	193	92%	22	6.8
Laddi	Wetland	020072	77	100%	4	3.9
McKay	Wetland	020083	20	100%	6	
Netta	Shallow	020052	168	80%	19	7.6
Sunrise	Man Made		134			
TPC	Man Made		34			

Lake Depth

A major factor that should be built into a classification system for CCWD lakes is the depth. Greater depth imparts greater vertical stability into a lake which has major implications for the lake quality and other characteristics. Alternatively, depth can be incorporated as a term that describes whether the lake stratifies

Using the MPCA criteria, of maximum depth greater than 15 feet, five CCWD lakes are considered deep.

One of these lakes (Crooked) is known to have Eurasian Watermilfoil,.

The remaining 7 lakes include 3 that are wetlands and four that are man-made and whose depth is unclear.

When public access was provided, one lake had an earthen access, but other accesses were limited to carry-in or a pier.

Nutrient Concentration

Total phosphorus concentration is a strong indicator of eutrophication in most Minnesota lakes.

Three of the 12 CCWD lakes considered had recent or historic TP concentration data. These data had been collected recently or from many years ago.

Impairment Listing

An impairment listing results from a lake not meeting its designated standard for nutrient concentrations or some other measure. A TMDL study provides a framework for reducing nutrient or other loading by identifying the magnitude and source of those loadings, and producing an Implementation Plan for guiding load reductions.

None of the lakes within the watershed are currently impaired.

Public Access

The level of public access is a strong indicator of the level of interest by persons wanting to use a lake and its susceptibility to influences that may be related to that access.

The strongest level of access, a concrete boat-launch ramp, had the following relations

Lake Name	Eurasian Water Milfoil	Curly Leaf Pondweed
Crooked	1990	2005
Ham		Yes (<2005)

The other types of public access listed, by pier, carry-in, or shoreline, were provided for

Management Plan and other Reports

This grouping is important because it often results from an interest in documenting the quality of an important resource. However, it may need to be qualified based on the focus and relative magnitude of the effort. A management plan can focus on shoreline development, water levels, water quality, fisheries, motorized access, or a number of things. Likewise, water quality reports have similar limitations because they may deal with one of many important water quality concerns or may treat them as a comprehensive system. A common water quality report is a vegetation or macrophyte survey that may result in a report, a map, a management plan or a combination of products.

Table X lists most of the plans and reports that were identified for lakes in the CCWD and other factors that were used in classifying the CCWD lakes.

Name	DNR ID	Management Tier	Depth	Lake Mgt Plan (Yr)	Water Quality Monitoring	Macrophyte Study
Amelia			Man Made			
Bunker	020090		Wetland		-	
Cenaiko	020654		Man Made			
Club West	020764		Man Made			
Crooked	020084		Shallow	2009	*	2011
Dianne			Man Made			
Ham	020053		Shallow		*	
Laddi	020072		Wetland		*	
McKay	020083		Wetland			
Netta	020052		Shallow		*	
Sunrise			Man Made		*	

Other characteristics that were considered for grouping lakes include the concentration of chlorophyll a (chl a) and the Secchi-disk transparency, which also are measurements that are commonly used to evaluate and characterize the trophic status of lakes.

The average transparency of 8 lakes was greater than the 2-meters threshold for eutrophic lakes. All were deep lakes, but even clear-water wetland lakes are unlikely to meet a criterion that typically exceeds their total depth. Shallow lakes often are influenced by factors such as wind-driven turbidity and color from decaying vegetation that reduces their transparency in spite of having high-quality water.

Lake Classifications

Lakes in the CCWD range from deep to shallow, riverine to land-locked; productive (eutrophic) to pristine (oligotrophic), with many other characteristics. Many of the lakes are associated with extensive wetland areas, or are shallow enough to be considered wetlands.

Although each of the CCWD lake systems is unique, they also have much in common since they are part of the same hydrologic system. In order to reduce complexity and better address management issues, placing each of the lakes in a classification system is helpful. This classification system identifies tiers to differentiate among classes. Each tier is intended to guide how actively and to what degree, the CCWD will manage lakes, the purpose of the management, and goals for lake quality. Both shallow and deep lakes are included within each tier. Lakes are subject to reclassification at any time based on new data, project implementation (such as adding a public access), or outcomes of a TMDL study.

The classification system presented here is built upon the logic and experience gained from a variety of lake classification systems employed for the CCWD lakes and for other lacustrine systems. The resource criteria for what comprises each tier are based on many important factors yet not all criteria must be met for a lake to be in a particular tier.

Tier I

This includes lakes that routinely provide regional public recreation opportunities including a range of boating activities, and dedicated swimming facilities. These lakes typically represent a high quality resource for fisheries and wildlife. Tier I lakes are maintaining ecoregion water quality standards or have a very strong likelihood of restoration to those standards.

Management Goal

The resource management goal for Tier I lakes is to maintain or fully restore the quality of the lakes for their designated uses. Typical management activities include providing both one-time capital projects, and on-going annual management and lake specific projects as determined through planning efforts.

The CCWD resource investment is usually higher relative to other tiers and with respect to other potential management partners.

A goal for the total phosphorus concentration for deep lakes within Tier I is less than 31 ug/L, and for shallow lakes is less than 48 ug/L. This is a step towards the prevention of nuisance algal blooms.

Tier II

These lakes provide, or have the capability to provide, passive regional public recreation opportunities including aesthetic enjoyment or other special purpose uses. As such, a consideration for lakes in this tier is if they are part of a broader park system or open space plan.

Tier II lakes may not be maintaining eco-region water quality standards but do have a reasonable likelihood of restoration to those standards.

Management Goal

The resource management goal for Tier II lakes is to improve the quality of the lakes in order to better support aquatic life and enhance the passive recreation experience.

Typical management activities include continuation of data collection and trend monitoring. Developing projects or supporting the effort of others to minimize the severity and frequency of algal blooms is a management activity to meet the goal.

The CCWD resource investment, relative to other tiers and with respect to other potential management partners,

is usually high.
A goal for the total phosphorus concentration for deep lakes within Tier II is 31-49 ug/L, and for shallow lakes is 48-83 ug/L.

Tier III

Public access is typically minimal for these lakes. As such, existing or potential regional recreation opportunities, active or passive, are negligible unless improvements are made.

Tier III can also reflect lakes where the quality of fisheries is significantly limited by lake depth, presence of invasive species, and land use factors. Another criterion for lakes in this tier is that the drainage area is wholly contained within a single municipal boundary.

If data are available, these lakes exceed eco-region standards; however, there may be some ability to rehabilitate the lake towards more desirable conditions.

Management Goal

The resource management goal for Tier III lakes is to assist others in managing the lake condition, or evaluate the condition of the lake if unknown.

Management activities include collaborating with municipalities and other program partners. Performing lake studies is a desired management activity but should be conducted as part of a larger, multi-lake effort. Collection of data is a management activity that should be done within the context of clear monitoring goals and objectives.

The CCWD resource investment, relative to other tiers and with respect to other potential management partners, is moderate.

A goal for the total phosphorus concentration for deep lakes within Tier III is 49-75 ug/L, and for shallow lakes is 83-150 ug/L.

Tier IV

This tier includes lakes that do not fit into the other 3 tiers. They typically are unable to provide recreational opportunities because they lack public access. Also, Tier IV includes lakes that are part of the CCWD trunk drainage system, which gives them unusually large drainage areas.

Lakes in this tier can also reflect those with no reasonable ability to sustainably maintain, or restore to, eco-region water quality standards. Lakes having unknown depths are considered shallow and Tier 4 until more information is available to establish them in another tier.

Management Goal

The resource management goal for Tier IV lakes is to maintain lake water quality.

Management activities to meet this goal include implementation of the CCWD stormwater rules for projects. Algal blooms are generally tolerated and efforts to control invasive species within the lake are not a priority for the District, although efforts by others will be encouraged.

The CCWD resource investment, relative to other tiers and with respect to other potential management partners, is low.

A goal for the total phosphorus concentration generally is not established for lakes grouped within Tier IV, and concentrations greater than 75 ug/L may be tolerated.

Wetland Classifications

Wetlands Definition

The statutory definition of wetlands is:

> Those areas inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas (33 CFR 328).

A wetland is an ecosystem that depends on constant or recurrent, shallow inundation, or saturation at or near the surface of the substrate.

The minimum essential characteristics of a wetland are recurrent, sustained inundation or saturation at or near the surface and the presence of physical, chemical, and biological features reflective of recurrent, sustained inundation or saturation.

Common diagnostic features of wetlands are hydric soils and hydrophytic vegetation. These will be present except where specific physiochemical, biotic, or anthropogenic factors have removed them or prevented their development. (National Research Council, 1995)

Wetland Types and Classifications

A number of wetland classification schemes have been developed (Shaw and Fredine, 1971; Cowardian, et. Al., 1979; Curtis, 1971; Eggers and Reed, 1997). This report will rely principally on the following classification systems by Shaw and Fredine (1971), Cowardian, et. Al. (1970), Eggers and Reed (1997) and Brinson (1992).

Circular 39

Developed by Shaw and Fredine (1971), Circular 39 is actually an update of a classification system published in 1953 by Martin et. Al.. The Circular 39 system classifies wetlands by "Type", eight of which are found in the Anoka Sand Plain. The wetland types are based on criteria such as water depth and permanence, water chemistry, life form of vegetation and dominant plant species.

Wetlands and Deepwater Habitats

Developed by Cowardian et. al. (1979) it is the most widely used system for classifying wetlands in the United

States. Used for the National Wetland Inventory, the system uses structural vegetative characteristics as a primary criteria. This classification system was designed to meet four objectives:

1. To describe ecological units that have certain homogenous natural attributes,
2. To arrange these units in a system that will aid in decisions about resource management,
3. To furnish units for inventory and mapping,
4. To provide uniformity in concepts and terminology throughout the United States.

Plant Community Types

Developed/Used by Eggers and Reed (1997) in their guide to "Wetland Plants and Plant Communities of Minnesota and Wisconsin" this classification system corresponds closely to the wetland plant communities described by Curtis (1971) and used in the Minnesota Rapids Assessment Methodology. The system identifies 15 plant communities found in the Anoka Sand Plain.

Hydrogeomorphic Classification

Developed by Brinson (1992), this classification is based on the hydrogeomorphic characteristics of geomorphic setting, water source and hydrodynamics. The classification is based on characteristics important in controlling how wetlands function (processes) and is appropriate for identifying wetlands that are functionally similar.

Those functional characteristics are:

1. Landscape position
2. Primary water source
3. Hydroperiod

The system identifies six wetland classes within the Anoka Sand Plain at the highest level based on geomorphic setting. The subclasses listed below each class are based on water source and hydrodynamic characteristics of the wetland.

Wetland Classifications of the Anoka Sand Plain

1. Depression and Swale Wetlands
2. Riverine Wetlands
3. Slope Wetlands
4. Organic Soil Flats
5. Mineral Soil Flats
6. Lacustrine Fringe Wetlands

Wetland Management Categories and Strategies	Six management categories exist as follows
Preserve	Wetlands placed in this category generally function at a high level
Manage 1	These wetland generally function at a high level, contain high vegetative diversity and wildlife habitat with some functions for water quality and flood attenuation
Manage 2	These wetland generally provide some functions for vegetative diversity and wildlife habitat with high functions for water quality protection and flood attenuation.
Manage 3	These wetland generally provide the highest functions for water quality protection and flood attenuation. Many of these wetland serve stormwater storage and treatment.
Restore	These wetlands received low functional capacity scores due to their location hydrologic disturbance or hydro-period but are good canadidates for restoration. .
Storm Pond	Water bodies that were created in upland areas for the purpose of treating and/or storing stormwater

State-wide Classification

The CCWD has an abundance of wetlands throughout the watershed as shown in Figure x.. Wetlands may be isolated or associated with lakes and streams, and may vary in the amount and length of saturation and/or inundation and types of vegetation.

According to the Minnesota Board of Water and Soil Resources, a wetland must meet three criteria:

1. It must have mostly hydric soils;
2. It must have standing water or saturated soil for at least part of the growing season; and
3. It must support mostly vegetation adapted to wet soil conditions

The CCWD, as the LGU, is responsible for administering WCA within the District, except within the City of Coon Rapids and state lands as defined by MN Rule 8040.0200 Subpart C.

The National Wetland Inventory is the most comprehensive map, which indicates the probable location of wetlands within the United States. Currently, the predominately used system to categorize wetland types is the Circular 39 (Shaw and Fredine, 1971) by the U.S. Fish and Wildlife Service. Under this method there are eight wetland types are recognized in Minnesota.

Type 1 - Seasonally Flooded Basin or Flat: Upland depressions, bottomland Sands (floodplain forests) that are covered with water or waterlogged during variable seasonal periods. Plant communities in these transitory wetlands are highly variable.
Type 2 - Wet Meadow: Shallow basins, sloughs, or low areas that may border shallow marshes. They usually do not have standing water during most of the growing season but are waterlogged within a few inches of the surface. Plants include grasses, sedges, rushes.
Type 3 - Shallow Marsh: A shallow basin often covered with 6 inches or more of water. Plants include grasses, bulrush, cattail, arrowhead, and smartweed.
Type 4 - Deep Marsh: Shallow lake basins and potholes that may border open water. They usually are covered with 6 inches to 3 feet or more of water during growing the season and have cattail, wild rice, water milfoil, duckweed, and water lily.
Type 5 - Shallow Open Water: Shallow lake basins that may border large open-water basins. These usually are covered with less than 10-foot-deep water and include shallow ponds and reservoirs. Emergent vegetation is similar to that of Type 4, but is on the fringe of open water.
Type 6 - Shrub Swamp: Occurs along sluggish streams, drainage depressions, and occasionally on floodplains. It often is covered with as much as 6 inches of water and is usually waterlogged during growing season. Vegetation includes alder, willow, buttonbrush, dogwood, and swamp privet.
Type 7 - Wooded Swamp: These occur mostly in shallow ancient lake basins, old riverine oxbows, flat terrains, and along sluggish streams. These often are covered with as much as 1 foot of water, and include Sand and coniferous swamps with tamarack, northern white cedar, black spruce, balsam fir, balsam poplar, red maple, and black ash.
Type 8 - Bogs: These are mostly shallow glacial lake basins and depressions, flat terrains, and along sluggish streams. With the water table at or near the surface and a spongy covering of mosses, they support woody and herbaceous vegetation including sphagnum mosses, sedges, leatherleaf, Labrador tea, cranberry, and cottongrass. They may include stunted black spruce and tamarack.

Classification System and Waterway Management

Assessment Summary: The legal drainage system consists of a series of open channels, tile, storm sewer pipe, swales, and streams, which connects the lakes and wetlands to the Mississippi River. The legal drainage system also consists of cross roads, culverts and bridges which convey the water to the downstream side of the roadway. Sometimes the culverts and bridges are owned by the drainage authority, but usually they are owned by the private landowner where the drainage system crosses a private drive or the city, county, state or township that constructed the road.

The origin of the open channels comprising the legal drainage system varies. The open channel may have been originally constructed where no previous natural swale or stream existed. In this case, the channel was entirely made by humans. Conversely, the open channel may have been created by straightening, deepening, widening or otherwise modifying a natural flow path or waterway. All or only portions of a natural waterway may have been modified. The major waterways within the CCWD (e.g., Sand Creek) serve a unique role, being defined as the "trunk system" because they are part of the legal drainage system and must serve as the outlet to convey runoff from agricultural and urbanizing areas downstream to the Mississippi River. For example, both Sand Creek and Clearwater Creek were originally natural streams that have been modified and now also serve as legal drainage systems.

The issues, considerations, approach and methods used to manage natural unmodified waterways can differ from those used to manage a constructed open channel. The methods used to stabilize the bank of a natural waterway for example, might focus more on the use of materials that fit with the context of the landscape rather than rock rip-rap. Expectations with regard to the ecological value and integrity vary dep ending upon the type of waterway. The MPCA is working toward implementing a Tiered Aquatic Life Use (TALU) framework to achieve the beneficial uses of streams and rivers within the State. The foundation for the TALU is that the biological condition of stream responds to stress along a gradient of biological condition. The biological condition is better where there is less stress. Biological standards are based on expectations established by observing a stream in good condition (i.e., reference condition). This framework is currently being used as the foundation for the TMDL being completed for Sand Creek.

Several issues are associated with classifying and managing the legal drainage systems and waterways within the CCWD:

Because of the varying origins of open channels comprising the legal drainage systems and waterways within the District, one issue is the manner in which waterways should be classified and how the classification method relates to establishing expectation for the biological condition and the approaches, methods and manner to stabilize and rehabilitate these waterways.

The funding of maintenance activities for the Trunk System is presently accomplished using ad Valorem funds. An issue is whether this should remain as the preferred approach.

Opportunities for Resolution: The resolution of these issues is possible through the development and implementation of a classification system for the waterways of the

District. The classification system can include establishing expectations for biological condition and the preferred methods for stabilization and rehabilitation.

Anoka County Geologic Atlas

In 2009 the CCWD provided partial funding to a multi-agency geologic atlas project. A county geologic atlas is a map-based report of groundwater and geology to be used for community planning and groundwater management. It is created by compiling boring records from 20,000+ water wells. The atlas provides detailed information about groundwater, including:

• aquifers, including identifying future water sources,
• aquifer sustainability,
• recharge areas,
• sensitivity to pollution,
• flow directions,
• connections to lakes, streams, and wetlands,
• chemistry,
• well head protection, and others.

Anoka County is the only twin cities metro county without a geologic atlas. This project is a cooperative effort of state and local agencies. 94% of funding is from the Legislative-Citizen Commission of Minnesota Resources (LCCMR). The Anoka Conservation District and all seven Anoka County Water Management Organizations are providing the other funding. The geologic atlas will be completed around 2013 or 2014.