South Washington Watershed District Comprehensive Wetland Management Plan (Insert)

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General Introduction

Contained herein is the Comprehensive Wetland Management Plan for the South Washington Watershed District (SWWD). This is an identified project in the SWWD's 1997 Watershed Management Plan (WMP). The Comprehensive Wetland Management Plan provides an inventory, functional assessment, and management classification of all known wetlands in the watershed. It also presents management standards for protecting the wetlands. The classification and standards will be implemented by the SWWD through an amendment to the WMP and incorporation into the Rules of the SWWD.

This report is intended to exist as a freestanding report, but also to be incorporated as an amendment to the 1997 WMP. It will supersede the interim wetland standards contained in the WMP. Accordingly, the section numbering is based on the corresponding section numbers in the WMP. Thus, it begins with Section 3, which is to replace section VI.B.3 in the WMP.

3. Comprehensive Wetland Management Plan

3.1 Introduction

Wetlands provide a variety of environmental benefits (called "functions" in this report) throughout the Watershed. Wetlands are part of the natural drainage system in the watershed, and help to maintain water quality, reduce flooding and erosion, provide food and habitat for wildlife, and provide open spaces and natural landscapes that many residents enjoy. Therefore, wetlands are important physical, educational, ecological, aesthetic, recreational, and economic resource to the watershed.

The Comprehensive Wetland Management Plan (CWMP) is a strategic watershed effort to inventory and assess the functions of its wetlands resources, and implement a vision for protection and enhancement of wetlands. This report describes the CWMP's background, process, and results.

3.1.1 Background

The need for this Comprehensive Wetland Management Plan was identified during the development of the SWWD Watershed Management Plan. The SWWD Watershed Management Plan identified several goals and policies. One of the goals identified during this process was to *protect the water resources and associated natural resources of the watershed in order to benefit recreation, wildlife, and future needs.*

The CWMP process relied on a Technical Advisory Committee to assist in establishing objectives and policies to preserve and/or enhance SWWD wetlands. The Technical Advisory Committee included participants from the Board of Water and Soil Resources, Washington Soil and Water Conservation District, Department of Natural Resources, cities, and watershed staff.

3.1.2 Goals

The goal of this CWMP is the management of wetlands based on the functions they perform. Since all wetlands are not equal in the functions they provide, an inventory and assessment of all wetlands allows the SWWD and cities to set up priorities. This CWMP includes a wetland inventory and classification system that will assist the SWWD in establishing priorities and focusing available resources for wetland protection, enhancement, and restoration. Because all wetlands have value, all are protected, to some degree, in this plan.

The CWMP is designed to provide the following benefits:

- Provide wetland inventory, assessment, and management information;
- Aid in administration of the Wetland Conservation Act (WCA) by providing information regarding the wetlands functions;
- Enhance wildlife values of wetlands;
- Provide and enhance recreational values;
- Designate wetland restoration/enhancement opportunities;
- Protect wetlands and adjacent resources that provide valuable ecological support; and
- Stormwater protection for wetlands

It should be noted that this wetland inventory has been created for planning purposes only. Regulation of activities potentially impacting individual wetlands will be based on a site-specific delineation of the wetland boundary as part of a proposed project.

3.1.3 Administration

The goal of the SWWD is to have the cities adopt the protection strategies within this CWMP. It is the responsibility of the SWWD to administer the CWMP unless and until the cities adopt the protection strategies.

3.2 Wetland Inventory Methodology

3.2.1 Wetland Identification

The wetland inventory was organized within the context of the Watershed Management Plan. Wetland identification numbers used in this CWMP are based on the major drainage districts defined in the WMP. The abbreviations used for the major drainage districts are shown in Table VI-3.1.

Table VI-3.1: Major Drainage Districts

Major Drainage District	Abbreviation
Wilmes Lake	WL
Armstrong Lake	AL
Powers Lake	PL
Colby Lake	CL
Bailey Lake	BL
West Draw	WD
Central Plateau	CP
Regional Park Lake	RL
Gables Lake	GL
Markgrafs Lake	ML
Mississippi River	MR
South Central Draw	SD

Each wetland is identified by the abbreviation of the major drainage district in which it is located, followed by a number to identify the subdistrict in which it is located and then a number or letter to differentiate the wetlands. A number was used for the identification of the wetland if the wetland is shown on the National Wetland Inventory Map. A letter was used for the identification of the wetland if it does not exist on the National Wetland Inventory Map. For example, wetland WD-1-5 is the 5th wetland designated within subdistrict 2 in the West Draw major drainage district that also is shown on the National Wetland Inventory

Map. Wetland WD-1-E is the 5th wetland designated within the same subdistrict that is not found on the National Wetland Inventory Map. The wetland designations are shown on the Wetland Management Classification Map at the back of this report.

3.2.2 Wetland Mapping

An ARC/INFO Geographic Information System (GIS) was used to aid in the inventory and final mapping of wetlands within the study area. The GIS database provides the SWWD and cities with a map that can be easily updated and integrated with other mapped data. The mapped data includes an estimate of the wetland boundary, field assessment information, management classification, and indication if the wetland is highly or moderately susceptible to stormwater inputs. The Wetland Management Classification Map at the back of the report shows the wetland locations, designations, and management classifications. Preliminary layouts for future development should consider the wetland boundaries on the map as a guide. The wetland boundaries should be delineated early in the platting process to avoid development within the wetlands and buffer zones.

3.2.3 Wetland Evaluation Methodology

Minnesota Routine Assessment Method Version 2.0

Wetlands are valued for a wide range of functions they perform, such as improving water quality, flood water attenuation, and providing fish and wildlife habitat. Recently, wetland scientists have developed methods to assess the functions of individual wetlands. The assessment evaluates characteristics such as plant community diversity and structure, connectivity to other habitat types, location in the watershed, and a wide range of other factors. The assessment is like a "report card" which evaluates the wetland's functions and quality.

The Minnesota Routine Assessment Method Version 2.0 (MNRAM) was used to assess the functions of all the wetlands inventoried for this plan. This method was developed by the Minnesota Interagency Wetland Group as a field evaluation tool to assess wetland functions on a qualitative basis. It is intended to document the field observations and interpretations of professionals who have had training and experience in wetland

science. This method is not intended to be a rigid procedure but rather an aid to complement trained observation and interpretive skills with additional qualitative evaluation.

Wetlands were visited by trained personnel using MNRAM to assess wetland functions for Floral Diversity/Integrity, Wildlife Habitat, and Aesthetic/Recreational value. A copy of MNRAM is presented in Appendix F.1.

Each wetland was assessed and assigned a rank reflecting the value of the functions it provides. Wetlands were ranked as Exceptional, High, Medium/High, Medium, Medium/Low, Low or Not Applicable for each functions assessed. The summary of the wetland functional is presented in Appendix F.2.

Database

All the MNRAM data sheets were entered into a database to be used by the SWWD. The database allows for quick retrieval of information for each wetland and allows queries to be performed to complete special searches within the database. For example, a search can be done to list all the wetlands that have high floral diversity.

Stormwater Susceptibility

One of the purposes of this CWMP was to determine stormwater protection standards for wetlands. There are many types of wetlands, each determined by its hydrology and vegetative composition. The wetland's sensitivity to stormwater input is dependent on the wetland community type and the quality of its plant community. Some wetlands (e.g., sedge meadows with carex species) are sensitive to disturbance and will show signs of degradation unless water quality, bounce and duration are maintained at existing conditions after construction. On the other hand, there are other wetlands (e.g., floodplain forests) which are better adapted to handle the fluctuating water levels and influx of sediment often associated with stormwater.

Site visit to the wetlands included a determination of the wetland plant community (-ities) and Floral Diversity using the key provide in MNRAM Version 2.0. The *Guidance For Evaluating Urban Storm*

Water and Snowmelt Runoff Impacts To Wetlands completed by the State of Minnesota Storm Water Advisory Group was used as a guide in the determination of wetland sensitivity to stormwater. This document divides wetlands into categories that include: highly susceptible, moderately susceptible, slightly susceptible, and least susceptible. The following are the procedures that were used to determine the wetland susceptibility to stormwater.

Highly Susceptible Wetlands Determination: A wetland is considered highly susceptible if:

- ✓ Forty percent or more of the wetland complex has a highly susceptible wetland community (-ities) as shown in Table VI-3.2 and;
- ✓ Highly susceptible wetland community (ities) have medium to exceptional floral diversity/integrity

Moderate Susceptible Wetlands Determination: A wetland is considered moderately susceptible if:

- ✓ Forty percent or more of the wetland complex has a moderately susceptible wetland community (-ities) as shown in Table VI-3.2 and;
- ✓ Moderately susceptible wetland community (ities) have medium to exceptional floral diversity/integrity

Table VI-3.2. Wetland Community Susceptibility to Stormwater Impacts

Highly Susceptible Wetland Communities*		**Moderately Susceptible Wetland Communities***
Sedge Meadow	Low Prairies	Shrub-Carrs
Bogs	Coniferous Swamps	Alder Thickets
Coniferous Bogs	Hardwood Swamps	Fresh (wet) Meadows
Open Bogs	Seasonally Flooded Basins	Shallow Marsh
Calcareous Fens		Deep Marsh

* Wetland community(ities) determined using key provided in MNRAM Version 2.0.

Slightly and Least Susceptible Wetlands Determination: Wetlands with low floral diversity as determined by MNRAM were considered to be least susceptible wetlands. Wetlands that do not fall under the high, moderate, or least susceptible categories are considered slightly susceptible. (Note: This category also includes wetlands or wetland complexes that contain 40 percent floodplain forest, which is a slightly susceptible wetland community, with medium to exceptional floral diversity.)

3.2.4 Procedures for Wetlands Not Inventoried as Part of this CWMP

If a wetland was not inventoried as part of this CWMP, it shall be assessed at the time that a project is proposed that may impact the wetland. MNRAM shall be applied by a wetland professional hired by the applicant. The SWWD will determine the ranking for each wetland function using the completed MNRAM form submitted by the applicant. The SWWD or the applicant may request the use of a Wetland Conservation Act Technical Evaluation Panel to make a decision on the ranking of the wetland's functions.

Final classification of the wetlands will be determined by the SWWD using the information contained within the completed MNRAM and applying the criteria below in Section 3.3.

3.3 Wetland Management Classification Methodology

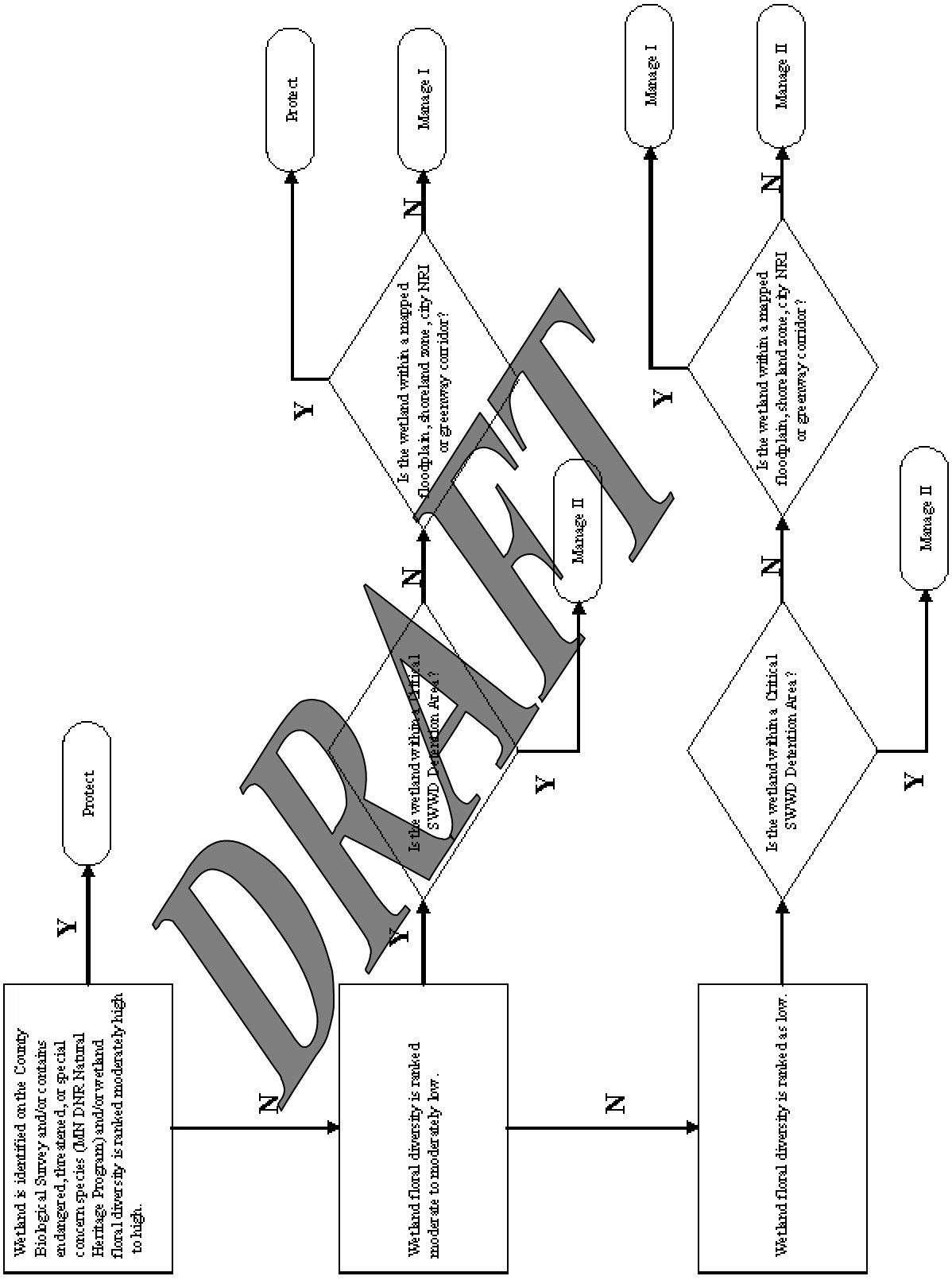
Following the assessments of wetland functions, the next step in developing this CWMP was the classification of each wetland for future management. Management recommendations are closely related to the functions each wetland performs in comparison to other wetlands in the watershed.

It is important to note that the comparison domain for the wetlands is the watershed district boundaries. It is possible that a wetland found within the watershed district boundaries may not be considered to be of high quality if compared to a wetland in northern Minnesota but in comparison with wetlands in the watershed district, the wetland may be valuable for the functions it performs.

The Technical Advisory Committee developed an overall functional ranking for the wetlands within the watershed that categorized the wetlands into Exceptional, High, Moderate, and Low. The process the

Technical Advisory Committee used to determine the overall functional ranking is presented in detail in the Wetland Functional Ranking Flow Chart (Figure IV-3.1). The final Wetland Management Classification were determined by the Local Advisory Committee considering the ranking of wetland functions and overall functional ranking shown in Appendix F and incorporating local values. In addition, the Citizens Advisory Committee developed a flow chart of important functions, evaluated the assessment of those functions using GIS and established values accordingly. Wetlands were classified into three categories: Protect, Manage 1, Manage 2, in general the Protect wetlands have the highest value, and Manage 2 wetlands have the lowest value.

Figure VI-3.1. Decision Flow Chart



3.4 Wetland Management Standards

All inventoried wetlands within the study area were classified for management. Wetland management standards are listed in Table VI-3.3. Management standards are based on input from the Technical Advisory Committee and Citizen Advisory Committee, with a goal of maintaining functions and related values of wetlands. Management standards have been established in four major categories:

- Water Quality Standards
- Buffer Zone Standards
- Water Quantity Standards
- General Standards

The management of wetlands requires connection with local land use authorities. Wetland resources cannot be adequately managed and individual functions maintained without a connection to the adjacent land use. Wetlands are a product of the adjacent topography and land use, therefore as adjacent land use changes resultant changes are reflected in the wetland. In an attempt to make this connection the SWWD wetland plan goes beyond classification of the wetlands provides a geographic element to manage wetlands.

The following sections provide details of each management standard developed for wetlands within the SWWD. Wetland management standards established in this plan will be included in the SWWD Rules, and provided to the Cities for incorporation into local ordinances.

Watershed Goals and Policies

Goal 1 Protect the watershed's water resources and natural resources to benefit recreation, wildlife, and future needs.

Policy A Identify and provide protection strategies for highly valued or sensitive water and natural resources.

Policy B Protect wetlands, lakes, streams, and their adjacent uplands.

Policy D Identify and provide a high level of protection for wetlands and other landscape features that serve as important groundwater recharge areas.

Policy E Identify and provide detailed standards to preserve the functional values of wetlands in the watershed including identifying restoration and high priority wetland areas.

Policy F Coordinate community development of linear greenways to encourage environmental passageways for wildlife and for recreational and aesthetic uses.

Policy G Manage the water quality of waters reaching the Mississippi River.

Policy H Incorporate natural area protection with local planning efforts.

Goal 2 Protect the water quality and quantity of surface waters and groundwater.

Policy A Require best management practices (BMPs) for surface water be followed in new and existing developments and encourage them in agricultural areas.

Policy B Manage surface waters so as to maintain good water quality including requiring water quality treatment ponds to prevent degradation of water resources.

Policy C Establish uniform base line standards for surface water within the watershed so as not to pollute downstream waterbodies.

Policy G Establish water quantity and quality standards within communities, based on the hydrologic setting of the community.

Goal 4 Encourage cities to use appropriate development practices to balance growth with environmental protection.

Policy B Encourage land use practices that consider the groundwater, surface water, and associated natural resources in the decision-making process.

3.4.1 Wetland Water Quality

Subd. 1 Wetland Water Quality Policy

When incoming quality water declines, the wetland's plant community may change to fewer numbers of species and retain only those species that are tolerant of high nutrient and sediment loads. This can result in an altered wetland plant community, changing the wetland's character and ecosystem often to a less valuable system in terms of biodiversity, wildlife habitat, and aesthetic quality.

Subd. 2 Wetland Water Quality Regulations

Wetland water quality standards apply to a project where the primary receiving waterbody for discharge of storm water is a wetland as defined by the United States Army Corp of Engineers Manual 1987. Other waterbodies, such as lakes, rivers, streams, shall comply with water quality targets specific to that waterbody or general watershed water quality standards, whichever is available. Identified wetlands are illustrated on Figure XX, any wetland not identified will require a delineation and functional assessment prior to permit application.

Subd. 3 Wetland Water Quality Standards

Wetland Management Classification	Stormwater Phosphorus Pretreatment Required
Protect	Maximum of 75% above Predevelopment Loads or diversions
Manage 1	Maximum of 75% above Predevelopment Loads or diversions
Manage 2	Maximum of Predevelopment Concentrations

Predev. = Predevelopment (Predevelopment concentration is defined as 200 ppb Phosphorus. Predevelopment runoff coefficient, C=0.07 for water quality proposed. Predevelopment and Post development concentrations will be measured with the use of an empirical model XX

3.4.2 Buffer Zones

Subd. 1 Wetland Buffer Policy

Buffers reduce impacts of surrounding land use on wetland functions by stabilizing soil to prevent erosion; filtering solids, nutrients, and other harmful substances; and moderating water level fluctuations during storms. Buffers also provide essential habitat for feeding, roosting, breeding and rearing of young birds and animals; and cover for safety, movement and thermal protection for many species of birds and animals. Buffers can be planned to tie important upland habitats to wetlands, or connect wetlands and other waters. The buffer can consist of trees, shrubs, grasses, wildflowers, or a combination of plant forms. A major goal of the buffer standard is to maintain connections with adjacent undisturbed area to promote connectivity and linear corridors. This will work to maintain connected landscape units as part of a larger system as development occurs.

Subd. 2 Wetland Buffer Regulations

Wetland water buffer standards apply to any project was has a wetland as defined by the United States Army Corp of Engineers Manual 1987, wholly or partially within the project

limits. The wetland limits shall be determined by a professional wetland delineation. If a delineated wetland is 100 feet or less from the project limits, buffer standards will apply. Identified wetlands are illustrated on Figure XX, any wetland not identified will require a delineation and functional assessment prior to permit application.

Subd. 3 Wetland Buffer Standards

Wetland Management Classification	Permanent Buffer Zone Average Width (feet)	Minimum Permanent Buffer Zone
Protect	100	50
Manage 1	50	25
Manage 2	25	15

3.4.4 Wetland Water Quantity

Subd. 1 Wetland Water Quantity Policy

In 1997, the State of Minnesota Storm Water Advisory Group, produced a document called *Guidance For Evaluating Urban Storm Water and Snowmelt Runoff Impacts To Wetlands*. The Storm Water Advisory Group found that there is a broad range of tolerance among wetlands to urban stormwater input. Some wetlands (e.g., bogs and fens) are sensitive to any disturbance and will show signs of degradation with even low level inputs of urban stormwater. On the other hand, some wetlands (e.g., floodplain forests) are better adapted to handle the fluctuating water levels and influx of sediment often associated with urban stormwater. To prevent impacts to high quality wetlands and capture available storage capacity of wetlands for flood control, wetland water quantity standards have been established.

Subd. 2 Wetland Water Quantity Regulations

Wetland water quantity standards apply to a project where the primary receiving waterbody for discharge of storm water is a wetland as defined by the United States Army Corp of Engineers Manual 1987. Other waterbodies, such as lakes, rivers, streams, shall comply with water quality targets specific to that waterbody or general watershed water quality standards, whichever is available. Identified wetlands are illustrated on Figure XX, any wetland not identified will require a delineation and functional assessment prior to permit application.

Subd. 3 Wetland Water Quantity Standards

Wetland Standard	Protect	Manage 1	Manage 2
Storm bounce for 10-year 24-hour rainfall (4.2 inches)	Existing	Existing plus 1.0 foot	No limit
Discharge rate into wetland for 2-year, 100-year rainfall (2.8 and 6.0 inches)	Existing	Existing or less	Existing or less
Inundation period for 1 & 2 year precipitation event	Existing	Existing plus 2 days	Existing plus 7 days
Inundation period for 1 & 2 year precipitation event	Existing	Existing plus 14 days	Existing plus 21 days
Run-out control elevation (free flowing)	No change	0 to 1.0 feet above existing run out	0 to 4.0 feet above existing run out
Run-out control elevation (landlocked)	Based on SWWD Floodplain Map	Based on SWWD Floodplain Map	Based on SWWD Floodplain Map

Existing = Existing in this chart means the existing hydrologic conditions. If there have been recent significant changes in conditions, it means the conditions that established the current wetland.
Urban = Wetlands located within the 1998 MUSA boundaries of the city.

* Wetland ID's that have a * following their identification are considered highly susceptible to quantity impacts from snowmelt and stormwater and are subject to the requirements within this table.

** Wetland ID's that have a ** following their identification are considered moderately susceptible to quantity impacts from snowmelt and stormwater and are subject to the requirements within this table.

3.5 General Wetland Standards

Replacement Ratio:

Wetland Management Classification	Area Replacement Ratio	Volume Replacement Ratio
Protect	3:1	2:1
Manage 1	2:1	2:1
Manage 2	1:1	2:1

Replacement location:

Wetland impacts regardless of classification will be replaced on-site whenever practical. The applicant must demonstrate that replacement on-site is not technically feasible or sound. Where on-site replacement is determined not to be suitable, replacement of wetland impacts shall be located within the hydrologic sub-watershed. The SWWD has determined sub-watersheds where flooding conditions exist, wetland replacement will target sub-watersheds that exhibit flood prone conditions. In addition, section 3.6 of the CWMP has identified wetland restoration sites that are also target as replacement sites. Replacement of wetland impacts on projects by public road authorities are provided through the State wetland bank.

Wildlife Functions:

Wetlands provide wildlife habitat for many species of wildlife and at various life stages of those species. Wetlands provide important habitat not only to species that depend on a wet environment, but also to terrestrial species that move in and out and through wetland areas. Impacts to wildlife habitat are difficult to quantify, therefore, mitigation of wildlife impacts will be accomplished through maintaining connectivity to surrounding habitat areas. Maintaining corridors through wetlands will provide paths for wildlife to access the wetland area. Connectivity of the wetland in addition to maintaining buffers adjacent to the wetland will provide adequate wildlife habitat. The SWWD will pursue the dedication of corridor areas as part of park land.

Excavation:

Excavation of a Manage II wetland is not considered an impact for purposes of this plan.

For lots of record created after the final approval of this CWMP, a buffer area shall be maintained abutting the wetlands with classifications that require buffer zones. Buffer standards are presented in Table VI-3.2.

In "Permanent Buffer Zones" vegetation shall be established and maintained in accordance with the following requirements:

A) Buffer area vegetation shall be considered adequate when the buffer has a continuous, dense layer of perennial grasses, flowers, trees and/or shrubs that have been undisturbed for at least 10 consecutive years. Vegetation shall be considered unacceptable if:

   1. it is composed of noxious weeds; or

   2. topography or sparse vegetation tends to channelize the flow of surface water; or

   3. for some other reason the vegetation is unlikely to retain nutrients and sediment.

B) Buffer areas shall be identified by permanent monumentation acceptable to the watershed. In residential subdivisions, a monument is required for each lot. In other situations, a monument is required for each three hundred feet of wetland edge.

C) The clearing and removal of vegetation in the buffer area is prohibited, except for selective clearing and pruning of individual trees and shrubs which are dead, diseased, noxious weeds, or hazards. Dumping grass clippings or other debris, and trampling should be avoided in buffer areas.

D) All buffer areas are measured from the delineated wetland edge as marked in the field.

E) Any wetland restored, relocated, replaced or enhanced because of wetland alterations shall have at least the minimum buffer area required for the class of the wetland involved.

F) The SWWD may recommend buffer area averaging in instances where it will provide resource protection to the wetland or to valuable adjacent upland habitat, provided that the total on-site area contained in the buffer remains the same.

G) When a wetland is completely filled, the buffer area requirement associated with the classification of the wetland that was filled will be required for the replacement wetland, unless replacement is occurring adjacent to a wetland with a higher classification. In this case, the buffer area requirement for the higher wetland classification will apply.

No grading in this zone will preserve adjacent habitat and maintain natural topography directly adjacent to the wetland. In addition the vegetation maintained or established within this zone will serve as a secondary protection, added to silt fence, to protect the wetland from sediments and nutrients during grading activities.

3.6 Wetland Restoration/Enhancement Opportunities

Wetland restoration/enhancement sites were identified during the field inventory. Typically, wetlands that were identified for restoration/enhancement had either a hydrologic impact that could easily be rectified or a plant community that was of exceptional to high quality. The areas with exceptional to high quality native plant populations could, with some minor management, have their ecological integrity enhanced and exotic species minimized. Wetlands that have hydrologic restoration proposed would likely qualify as wetland banking sites if restored.

Wetland banking is a type of mitigation, or replacement for wetland losses, allowed under State and Federal rules. Wetland banking allows the appropriate amount and type of wetland acreage to be purchased from an account holder who has a "bank" of functioning wetlands. These wetlands may have been restored from previously drained or filled wetlands, or created where wetlands did not previously exist. Wetland banking is contrasted with project-specific replacement where the project sponsor creates or restores a wetland specifically to replace a wetland that is to be drained or filled. Project specific replacement is usually done on-site, while wetland banks are typically located in another place in the community or watershed.

Site-specific replacement should be encouraged when a wetland restoration or creation is possible on-site. When site-specific replacements are not ecologically appropriate, then wetland banks located within the SWWD district can be used for replacement.

The funding for the wetland restoration sites can come from a variety of sources, which include:

- BWSR Banking Money for Road Construction Projects;
- Department of Natural Resources, Conservation Partners and Community Environmental Partnerships grants;
- Department of Natural Resources Greenway grants; and
- Soil and Water Conservation District grants.

Wetland Restoration/Enhancement sites are identified and discussed in Table VI-3.3.

Table VI-3.3. Wetland Restoration/Enhancement Sites

Wetland #	Public Land Y/N	Restoration Activity
WD-1- 6	Y	Block minor ditching to restore hydrology
WD-1-11	Y	Block ditch or install control structure to restore hydrology
WD-1-C	Y	Flora indicates that active management of plant community would further improve quality. It is currently one of the more species rich wetlands in the area.
WD-1-D	Y	Formerly a wet swale. Blocking ditch that outlets to the east would restore hydrology to this wetland and help to improve the wetland to the west as well.
WD-1-12	Y	The plant community of this wetland is of exceptional quality. This area should be managed to maintain integrity and minimize establishment of purple loosestrife, which is found in adjacent wetlands. Ecological restoration of adjacent upland areas would greatly enhance the landscape-level value of this site.
WD-1-15	Y	Similar to recommendations for WD-1-12. Slightly less species richness and overall quality in this wetland compared to WD-1-12
WD-1-16	N	Hydrologic restoration of this wetland would be easily accomplished by blocking small outlet ditch. Surrounding area is ecologically significant for area with Oak woodland/savanna and wetland complex.
WD-1-18	N	Hydrologic restoration of this wetland would be easily accomplished by blocking small outlet ditch. Surrounding area is ecologically significant for area with Oak woodland/savanna and wetland complex.
WD-1-G	Y	Hydrologic restoration of this wetland would be easily accomplished by blocking small outlet ditch. Surrounding area is ecologically significant for area with Oak woodland/savanna and wetland complex.
WD-1-22	Y (partial)	This wetland represents one of the best remaining examples of a slope swale wet/sedge meadow in the study area. Ecological restoration should include retention of hydrologic characteristics of the area as well as management of the purple loosestrife and reed canary grass present.

Table VI-3.3. Wetland Restoration/Enhancement Sites (Continued)

Wetland #	Public Land Y/N	Restoration Activity
WD-1-28	N	Outlet is a narrow ditch cut through a small hill. Blocking of ditch, or installation of a control structure would help to restore both the hydrology and the plant community in this wetland.
WD-1-29	N	Outlet is a narrow ditch cut through a small hill. Blocking of ditch, or installation of a control structure would help to restore both the hydrology and the plant community in this wetland. This would also help to control erosion in downstream area where significant downcutting has caused moderate to severe erosion.
WD-1-30	N	This wetland receives excessive sediment loads from the NNW (under Military Rd.). Minimizing storm impact and sediment transport would help to maintain the better quality areas of this wetland. Also, outlet ditch could be blocked or have a structure installed to partially restore hydrology to this area, which was formerly a sedge meadow.
WD-3-2	N	Management of the oak-dominated upland community surrounding this wetland would greatly improve the overall landscape-level functionality of this area. Suggested activities include removal of buckthorn and other problem species and the reintroduction of prescribed fire.
WD-3-5	N	Although ditched and partially drained, this small, depressional wetland retains good species richness. It has the potential to dramatically improve in quality by blocking the outlet ditch, which flows to the SE.
WD-3-10	N	Moderate quality wetland that would improve in quality with management of the wetland and surrounding upland community, which is oak woodland-brushland. Restoration of upland could include problem species removal, prescribed fire and seeding of additional species.
WL-3-15	Y	This large wet meadow is a significant natural community for the SWWD. It should be managed for the greatest ecological stability and maintenance of natural community integrity. Current impacts that should be addressed include dumping of yard waste, encroachment of lawns, and stormwater impacts on the south side. Restoration activities for the site could include management of shrubs to delay sedge/wet meadow transition to shrub swamp/forested swamp.

Table VI-3.3. Wetland Restoration/Enhancement Sites (Continued)

Wetland #	Public Land Y/N	Restoration Activity
MR-6- 8	Future SNA	Will likely have restoration of plant community through the use of fire and/or brush cutting once the land is transferred to the MN DNR SNA.
PL-1- 2	N	Most of the wetland is dominated by reed canary grass. There are some remnant pockets of native grasses including a pocket of soft stem bulrush. A prescribed burn in combination with raising the outlet elevation would aid in enhancing this wetland.
PL-2-2	Y	Enough pockets of native vegetation present that vegetative restoration using prescribed fires would enhance this wetland. It is located within a park so this wetland should be ranked high for ecological restoration.
PL-2-8	Y (north tip)	This site is dominated by reed canary grass. Raising the outlet approximately 1-foot under the road is likely the best alternative for enhancement of this site.
PL-2-9	Y	This wetland was formerly inundated to a depth of approximately 1 – 2 feet by beaver dam. Restoration to the historic beaver dam elevation with an outlet that has rate control would help reduce erosion of a ravine and would provide additional treatment for Powers Lake.
WD-1-17	N	Ditching through wetland. Restoration would involve ditch blocks in several locations to reduce the scope and affect of the ditch.
WL-1- 3, WL1-B, WL 1-C, WL 1-D	N	These wetlands occur along the same drainage-way located within a Primary Greenway corridor that extends from Armstrong Lake through the core of the Woodbury Parks. Restore ditch to the historic swale would restore hydrology to the wetlands. Would likely need prescribed burn management to aid in setting back reed canary grass and establishment of natives.
WD-1- E	Y	Block minor ditching to restore hydrology.
AL-1B	N	Block ditching to restore hydrology
WL-4-B	Y	Enhance wetland through prescribe burn management and native seeding

3.6 Wetland Stewardship

There are a number of things that residents and cities can do voluntarily to enhance wetlands and buffer strips that surround wetlands. This section describes some of these practices.

3.6.1 Enhancement

Native wildflowers, grasses, shrubs and trees can be planted in the wetland or the adjacent buffer areas to enhance habitat and stormwater filtering. Habitat can be enhanced by creating more vertical layers (such as adding trees or shrubs where these are absent), and by adding plants that provide food and cover, such as fruiting shrubs. Increasing the structural and plant species diversity in the landscape provides additional habitat niches, and can increase the numbers and species of animals using the area. Many of these plants also make the landscape more attractive for human inhabitants.

Species that are native to the area will probably require the least maintenance, survive harsh Minnesota weather more easily, and provide the greatest habitat benefits. The book Landscaping for Wildlife by Carroll Henderson and other references that are available in most book stores or from the Minnesota Extension Services can help landowners to add plants that enhance the wetland and increase the variety of attractive plants and wildlife. The SWWD and other public agencies can demonstrate appropriate wetland plantings and enhancements when wetlands are restored or created on public properties.

3.6.2 Control of Invasive Exotic Species

Several non-native species (sometimes called exotics) have become problems in Minnesota wetlands and adjacent uplands. These include purple loosestrife, European buckthorn, black locust, reed canary grass, and leafy spurge. These plants invade native plant communities and can take over rapidly, eliminating native plants that provide important food and habitat benefits.

Invasion by exotic species can be controlled by minimizing disturbance to wetlands and buffer areas as much as possible to avoid the creation of openings for exotics to invade. Small populations of many exotic species can be controlled by hand removal or direct application of appropriate herbicides that are licensed

for use near water. The Minnesota DNR provides information about identifying or controlling exotic species around wetlands.

3.6.3 Habitat Structures

Wetlands provide important habitat for many species of birds and other animals. Adding wood duck nest boxes and other types of nesting structures for ducks and other birds can augment nesting habitat, help birds to avoid predators, and enhance opportunities to view and enjoy wildlife. The Minnesota DNR, Minnesota Waterfowl Association, and other habitat enhancement organizations can provide information about the types of structures available and sources. Retaining or adding stones, logs, and dead trees near wetlands and within buffers provides habitat for turtles, other reptiles and amphibians, and resting areas for birds and animals.

Habitat areas may also become refuges for large populations of deer, geese, and wildlife that may become a nuisance in urban areas. When needed, population control measures should be included in management plans for these areas. Minnesota DNR staff can provide assistance in the development and implementation of these plans.

3.6.4 Learning Opportunities

Schools and other organizations can adopt wetlands and adjacent areas for use as outdoor classrooms. Students, parents, and teachers can add native wetland and upland plants, habitat structures, and other enhancements to increase learning opportunities and encourage other wetland owners in the area to make similar enhancements.

Glossary

Alteration: A human-induced action that adversely impacts the existing condition of a wetland or wetland buffer area, including grading, filling, dredging, dumping; cutting, pruning, topping, and clearing native vegetation; and discharging pollutants (except stormwater). Alteration does not include walking, passive recreation, fishing, farming, planting that enhances native vegetation, or other similar activities allowed under the Minnesota Wetland Conservation Act.

Average Buffer Width: The average width of a buffer area within a single development, lot or phase.

Buffer Zone: An unmown, undisturbed, or reestablished vegetated area adjacent to a wetland that is an integral part of protecting the wetland ecosystem through filtering pollutants and providing adjacent habitat.

Community: In reference to plants, an interacting assemblage of plant populations sharing a given habitat.

Ecosystem: A community represented by interaction among animals, plants, and microorganisms, and the physical, biological and chemical environment in which they live.

Enhance: To heighten the value of wetlands or wetland buffers with respect to the purposes of this CWMP.

Exotic Species: A species that has been introduced to an area by humans from a different geographic region or continent, or that is present in the area as a result of human-caused change.

Manage: To control the use of wetland resources consistent with the purposes of this CWMP. Management of wetlands includes conservation, maintenance, and enhancement.

Restoration: Reestablishment of an area that was historically wetlands but has been changed by manmade alterations such as filling or drainage.

Structure: That which is built or constructed, an edifice or building of any kind, or any piece of work artificially built up or composed of parts jointed together in some definite manner.

Vegetation, Native: The presettlement group of plant species native to the the local region that were not introduced as a result of European settlement or subsequent human introduction.

Wetland: Lands transitional between terrestrial and aquatic ecosystems, where the water table is usually at or near the surface or the land is covered by shallow water. Consistent with the WCA, wetlands are to be identified and delineated using the methodology set forth in the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (Interagency Task Force on Wetland Delineation, 1987). For purposes of this definition, wetlands must have three of the following attributes:

(1) A predominance of hydric soils;

(2) Inundation or saturation by surface or ground water at a frequency and

duration sufficient to support a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions;

(3) Under normal circumstances support a prevalence of such vegetation.

This definition does not include wetlands created from uplands either: (l) for stormwater storage and management purposes or (2) by actions not intended to create the wetland and approved, permitted, funded, or overseen by a public entity.

Wetland Edge: The line delineating the outer edge of a wetland. This line shall be established by using the 1987 Corps of Engineers (COE) Wetlands Delineation Manual (Environmental Laboratory, 1987).

Wetland Functions: The natural processes performed by wetlands, including functions that are important in providing wildlife, aesthetics, and floral diversity/integrity, facilitating food chain production, providing habitat for nesting, rearing, and resting sites for aquatic, terrestrial or avian species, maintaining the availability and quality of water, such as purifying water, acting as a recharge and discharge area for groundwater aquifers and moderating surface water and stormwater flows, improving stormwater quality, and well as performing other functions, including but not limited to those set out in U.S. Army Corps of Engineers regulations at 33 C.F.R. Section 320.4(b)(2)(1988).

WETLAND TYPES:

- Seasonally Flooded Basins or Flats (Type 1) - Soil is covered with water or is waterlogged during variable seasonal periods but usually is well-drained during much of the growing season.

- Inland Fresh Meadows (Type 2) - Soil is usually without standing water during most of the growing season but is waterlogged within at least a few inches of the surface.

- Inland Shallow Fresh Marshes (Type 3) - Soil is usually waterlogged early during the growing season and often covered with as much as 6 inches or more of water.

- Inland Deep Fresh Marshes (Type 4) - Soil is usually covered with 6 inches to 3 feet or more of water during the growing season.

- Inland Open Fresh Water (Type 5) - Shallow ponds and reservoirs are included in this type of wetland. Water is usually less than 10 feet deep and fringed by a border of emergent vegetation similar to open areas of Type 4.

- Shrub Swamps (Type 6) - Areas where shrub species are growing in soil that is usually waterlogged during the growing season and is often covered with as much as 6 inches of water.

- Wooded Swamps (Type 7) - Areas where trees and forested areas are located in soil that is waterlogged at least to within a few inches of the surface during the growing season.

- Bogs (Type 8) - Soil is usually waterlogged and supports a spongy covering of mosses.

South Washington Watershed District
Wetland Management Plan