APPENDIX C

PLANNING REGION 3

PLANNING SUMMARY
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List of Exhibits
A Long-Range Work Plan
1. Document Purpose

The Sand Hill River Watershed District (SHRWD) is a local unit of government responsible for water and resource management within portions of Polk, Norman and Mahnomen Counties, in northwestern Minnesota. Operation of the SHRWD is guided by their “Watershed Management Plan” (WMP). Initial development and updates to the plan are required by the Board of Water and Soil Resources (BWSR). Minnesota Statutes 103D provides the required content for a WMP. The SHRWD is also a drainage authority and guided by Minnesota Statutes 103E.

The SHRWD divided the area within their legal boundary into four distinct planning regions for the purpose of preparing the WMP update. These Planning Regions have been defined and established to reflect unique resource problems and issues common to each region. However, they are also based partly upon hydrologic boundaries. Hydrologic
processes are fairly similar within these Planning Regions, which aids in providing focused management of the water and natural resource issues for the SHRWD.

This document provides a description of the physical characteristics of Planning Region 3, identifies resource issues and problems, describes previous efforts to correct issues and problems and outlines potential solutions. The document also includes information obtained during the public involvement process. The document is not intended to serve as a “stand alone” plan for Planning Region 3. Rather, this document is intended to serve as a tool for soliciting input about resource issues and problems, identify potential solutions and describe how Planning Region 3 differs from the other Planning Regions. Portions of this document will be used to prepare the main body of the WMP, and this document should be used in conjunction with the main body of the WMP.

2. General Description of Planning Region 3

2.1 Location, Size and Population Trends

Planning Region 3 covers 43046 acres, or 67 square miles, and is located in the central part of the SHRWD (Figure 2.1). There are no municipalities within Planning Region 3. Most of Planning Region 3 lies in Polk County, with a small portion extending into Norman County. There are no State or Federal highways that run through Planning Region 3. The major county highways servicing this planning region are Polk CR 1, 12, 39, 42 and 34.

Population trends are important because growth affects how water and natural resources are used. The population within Planning Region 3 is currently estimated to be 1036 people. The population within Polk County decreased by 1.9% from April 2000 to July 2006. The trend reflects the fact that rural areas are losing population to urban areas.
2.2 Physical Setting

2.2.1 Geology

The geology of an area is important because it can be related to the depth water can be reached below the ground surface, affects the movement of water from the land surface into the underlying aquifers, is related to the parent material available for the formation of soil and is important for understanding the structural engineering properties of the surficial layer.

Over twelve thousand years ago, much of the SHRWD was covered by glacial Lake Agassiz. Lake Agassiz was formed by an accumulation of melt waters from the last receding glacier (Figure 2.2). The central and eastern portion of Polk County, which includes Planning Region 3, are located just outside of this historic lake bed and is called the Lake Plain ecoregion. The Lake Plain ecoregion is characterized by thick lacustrine sediments (i.e., associated with standing water) formed by the lake underlain by glacial till (Figure 2.3). Planning Region 3 lies in the glacial moraine area of the ancient lacustrine lake basin.

2.2.2 Topography

The topography of the land surface dictates the direction and movement of surface waters, whether drainage is needed for agricultural production and the distribution of plant types. Topography also provides some indication of the movement of surficial ground water. Planning Region 3 has a large variation of topography and landscape features in comparison to the other Planning Regions. This planning region is unique in that it contains most of the lakes within the SHRWD. The SHRWD is characterized by three physiographic regions. The glacial lake plain, which lies mostly in Planning Region 1, and the glacial moraine area, which overlays Planning Regions 3 and 4, is separated by the beach ridge area (i.e., Planning Region 2). The glacial moraine area, which characterizes Planning Region 3, is formed as the glacial lake plain rises almost uniformly across elongated ridges of beach sands and gravel into upland hills. This region was formed as the glacier deposited soil, rocks and other debris. Rolling prairie with scattered areas of sharply rolling hills interspersed with lakes, ponds, wetlands and bogs, characterize the area.

The elevation ranges between 1,100 and 1,300 feet for the entirety of Planning Region 3 (Figure 2.4).
Data source: MN DNR Data Deli, USFW site

Legend
- County Boundary
- Legal Boundary
- Cities
- Sections_Watershed
- Townships

Transportation
- US Highway
- State Highway
- County Highway
- County Road
- Legal Drainage Ditch
- Railroads

Water Features
- Centerline (River)
- Stream (Perennial)
- Drainage Ditch (Perennial)
- Stream (intermittent)
- Drainage Ditch (Intermittent)
- Waterbody

Geomorphology

Sedimentary Association
- Alluvium
- Outlets
- Ice Contact
- Lacustrine
- Outwash
- Peat
- Supraglacial Drift Complex
- Till Plain

Location Map

Figure 7.2: Geomorphology

Legend
- County Boundary
- Legal Boundary
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- Sections_Watershed
- Townships

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Data source: MN DNR Data Deli, USFW site

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- Till Plain

Data source: MN DNR Data Deli, USFW site

Location Map
2.2.3 Soils

The soils within an area affect the movement of surface water, the need for agricultural drainage and the amount of sediment entering streams, rivers and lakes. The parent material for the soils in Planning Region 3 is comprised of a variety of soils ranging from moderately dark to light colored light textured to medium textured in the western portion of the planning region – mainly Waukon, Some Buse, Flom and Parnell. The eastern portion of the planning region consists of light colored, medium to moderately textured well drained soils developed under timber vegetation form heavy, calcareous glacial till.

The soils in Planning Region 3 are susceptible to wind erosion, with an erodibility index of 4 or 4L on a scale of 1-8, where the low end of the scale is the most susceptible to wind erosion (Figure 2.6).

2.2.4 Land Use

Planning Region 3 is mostly agriculturally dominated region in the SHRWD (Table 1C). The primary land use is cultivated land (50%) followed by wetlands (14%). Because most of the land is cultivated and in agricultural production, many of the resource issues within Planning Region 3 are related to intensive agriculture. Drainage is needed to improve yield and reduce the likelihood of crop loss. Stream channels and creeks have been modified by straightening and/or deepening. Historic wetlands and prairie areas have been converted into agricultural lands.

<table>
<thead>
<tr>
<th>Land Use Category</th>
<th>Acres</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban and Industrial</td>
<td>2,340</td>
<td>5.45</td>
</tr>
<tr>
<td>Cultivated Land</td>
<td>21,605</td>
<td>50.29</td>
</tr>
<tr>
<td>Transitional Agricultural, Pasture and Hayy Land</td>
<td>1,433</td>
<td>3.34</td>
</tr>
<tr>
<td>Grassland</td>
<td>1,513</td>
<td>3.52</td>
</tr>
<tr>
<td>Grassland-Shrub-Tree (deciduous)</td>
<td>6</td>
<td>0.01</td>
</tr>
<tr>
<td>Deciduous Forest</td>
<td>4,983</td>
<td>11.60</td>
</tr>
<tr>
<td>Water</td>
<td>4,959</td>
<td>11.54</td>
</tr>
<tr>
<td>Wetlands</td>
<td>6,120</td>
<td>14.25</td>
</tr>
<tr>
<td>Exposed Soil, Sandbars, and Sand Dunes</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>42,960</td>
<td>100.00</td>
</tr>
</tbody>
</table>
Figure 2.6: Wind Susceptibility

Legend
- County Boundary
- Legal Boundary
- Cities
- Sections_Watershed
- Townships

Transportation
- US Highway
- State Highway
- County Highway
- County Road
- Legal Drainage Ditch
- Railroads

Water Features
- Centerline (River)
- Stream (Perennial)
- Drainage Ditch (Perennial)
- Stream (Intermittent)
- Drainage Ditch (Intermittent)
- Waterbody

Wind Erodibility Group
1 (Most susceptible to erosion)
2
3
4
5
6
7
8 (Least susceptible to erosion)
Unknown

Data source: MN DNR Data Del. / USGS - NRCS Soil Survey

Location Map

PLANNING REGIONS

Region 1
Region 2
Region 3
Region 4

AS SHOWN
Figure 2.6.2: Potential Water Erosion in the SHRWD

PLANNING REGIONS

Legend
- County Boundary
- Legal Boundary
- Cities
- Sections_Watershed
- Townships

Transportation
- US Highway
- State Highway
- County Highway
- County Road
- Legal Drainage Ditch
- Railroads

Water Features
- Centerline (River)
- Stream (Perennial)
- Drainage Ditch (Perennial)
- Stream (Intermittent)
- Drainage Ditch (Intermittent)
- Waterbody

State and Federal Land
- National Wildlife Refuge
- Waterfowl Production Areas
- Wildlife Management Areas
- Scientific and Natural Areas

Potential Water Erosion
- Low
- Medium
- High

Data source: MN DNR Data Deli, USDA - NRCS Soil Survey

Location Map
2.2.5 Land Ownership

Land ownership is important to the SHRWD because during the development of potential projects, the ownership directly dictates the project permitting process, official notifications and how the land may be utilized. The City of Fertile, located immediately outside of Planning Region 3 and to the west, is the only urban area impacting Planning Region 3, providing support to the local rural area. Fertile also has a small airport to the northwest of the city.

The lands within Planning Region 3 are mostly owned by private landowners and are used for agricultural production. The presence of lakes suitable for recreation has resulted in extensive lake shore development, in particular Lake Union and Lake Sarah.

Exceptions are State DNR WMAs in Woodside Township in Polk County (about 80 acres), and in Bear Park Township in Norman County (about 200 acres). The USFWS also has several WPAs scattered throughout Godfrey Township (80 acres), Woodside Township (20 acres), Knute Township (400 acres), Garfield Township (400 acres), Garden Township (320 acres), and Winger Township (520 acres). Locations of State WMAs and USFWS WPAs are shown on Figure 2C.

2.3 Fish, Wildlife and Natural Resources

The Minnesota County Biological Survey (MCBS) has identified native plant communities that are important areas for conservation (See Figure 1C). Native plant communities (sometimes also referred to as "natural communities") are groups of native plants that interact with each other and their surrounding environment in ways not greatly altered by modern human activity or by introduced plant or animal species. These groups of native species form recognizable units, such as an oak forest, a prairie or a marsh, that tend to repeat across the landscape and over time. Native plant communities are generally classified and described by taking into account vegetation, hydrology, land forms, soils and natural disturbance regimes. The native plant community types and subtypes in this data layer are classified primarily by vegetation and major habitat features. Classification and inventory of native plant communities is an ongoing effort of the Minnesota DNR Natural Heritage and Nongame Research Program and the MCBS. The abstract of this metadata can be found at http://deli.dnr.state.mn.us/metadata/mcbs_npcpy3.html.

There are important natural resource features are associated with the natural watercourses within Planning Region 3, specifically the Sand Hill River (see Figure 2C).
The Sand Hill River meanders through the south part of the planning region as it cuts its way through the beach ridge on its westerly course through the glacial lake plain to the Red River. Wild turkeys and deer concentrate along water courses, within agricultural fields and waterfowl protection areas (WPAs). The WPAs typically contain wetland areas that the U.S. Fish and Wildlife Service (USFWS) has either acquired through fee title or obtained an easement interest to preserve breeding, nesting and feeding habitat for migratory waterfowl. The USFWS is responsible for the compatibility determinations and issuance of permits involving these lands.

### 2.3.1 Rare Natural Features and Those Subject to Special Protection

Understanding the type and location of rare natural features is important. Projects and human related activities should be located in a manner that minimizes the physical (i.e., direct) and indirect impacts to rare natural features. A determination of “rare” is primarily based upon work completed by the MCBS. The goal of the MCBS is to identify significant natural areas and to collect and interpret data on the distribution and ecology of rare plants, animals and native plant communities.

There are two MCBS sites located on the Sand Hill River in Planning Region 3 (Figure 1C), involving invertebrate animals. Four MCBS sites with vertebrate animals have been identified within Godfrey and Woodside Townships. There are six rare native plan communities documented in Planning Region 3 according to the MCBS (Figure 1C).

#### 2.3.1.1 Calcareous Fens

Calcareous fens are the rarest wetland plant community type in Minnesota, if not North America. These are plant communities of wet, seepage sites that have an internal flow of groundwater that is rich in calcium and magnesium bicarbonates, and sometimes calcium and magnesium sulfates. There are no known Calcareous Fen’s located within Planning Region 3.

#### 2.3.1.2 Federal Threatened and Endangered Species

The USFWS in the Department of the Interior and the National Oceanic and Atmospheric Administration Service (NOAA) in the Department of Commerce share responsibility for administration of the Endangered Species Preservation Act. Congress passed the Endangered Species Preservation Act in 1966. This law allows listing of only native animal
species as endangered and provides limited means for the protection of species so listed. The Departments of Interior, Agriculture, and Defense were to seek to protect listed species, and insofar as consistent with their primary purposes, preserve the habitats of such species. Land acquisition for protection of endangered species is also authorized. The Endangered Species Conservation Act of 1969 was passed to provide additional protection to species in danger of "worldwide extinction". Import of such species is prohibited, as is their subsequent sale within the United States.

The USFWS maintain a list of the species protected and under the Endangered Species Act (http://www.fws.gov/midwest/endangered/index.html). The bald eagle (*Haliaeetus leucocephalus*) is listed as threatened within the SHRWD. This is the only "listed" species.

2.3.1.3 Minnesota Species Protected Species and Species of Special Concern

Minnesota's endangered species law (MS 84.0895) and associated rules (Chapters 6212.1800, 6212.2300 and 6134) impose a variety of restrictions, a permit program and several exemptions pertaining to species designated as endangered, threatened, or species of special concern. The law and rules prohibit taking, purchasing, importing, possessing, transporting or selling endangered or threatened plants or animals, including their parts or seeds, without a permit. For animals, taking includes pursuing, capturing or killing. For plants, taking includes picking, digging or destroying. The law and rules specify conditions under which the commissioner of the Minnesota Department of Natural Resources (DNR) may issue permits to allow taking and possession of endangered or threatened species.

A species is considered endangered if the species is threatened with extinction throughout all, or a significant portion, of its range within Minnesota. A species is considered threatened if the species is likely to become endangered within the foreseeable future throughout all, or a significant portion, of its range within Minnesota. A species is considered a species of special concern if, although the species is not endangered or threatened, it is extremely uncommon in Minnesota or has unique or highly specific habitat requirements and deserves careful monitoring of its status. Species on the periphery of their range that are not listed as threatened may be included in this category along with those species that were once threatened or endangered but now have increasing or protected, stable populations.
2.3.2 Natural Resources Assessment

The SHRWD contracted with the Minnesota Center for Environmental Advocacy (MCEA) to provide a watershed-based natural resource assessment of the SHRWD. The Red River Flood Damage Reduction Mediation Agreement requires that the enhancement of natural resources be considered and incorporated into the next generation of WMPs. The purpose the watershed-based natural resource assessment is to identify areas where effort should be made to maintain existing natural resource features and identify opportunities for enhancing natural resources.

The presence of diverse natural resource features on a landscape contributes to a functional landscape. Relatively undisturbed natural resource areas (woodlands, wetlands, grasslands, brushlands, etc) provide important habitat. These areas also provide important recreational opportunities (fishing, hunting, camping, bird watching, etc), potentially enhancing the economy of rural Minnesota. Identifying the locations of these areas may assist in identifying opportunities for projects with both flood damage reduction and natural resource enhancement benefits and also reduces the likelihood of potential land use conflicts.

This MCEA natural resource assessment evaluated several factors in order to identify existing quality natural resources and opportunities for restoration and enhancement. These methods included developing Geographic Information System (GIS) data and using these data to identify areas based upon criteria established by MCEA and resource professionals. County, State and Federal natural resource professionals were consulted to refine the information developed and provide guidance about natural resource enhancement goals, objectives and priorities for various subwatersheds. Three resource categories were identified: 1) existing resources; 2) restorable resources; and 3) priority natural resource areas.

Planning Region 3 includes a diverse mix of agricultural land, grasslands, wetlands, woodlands, shallow lakes, and fishing lakes. The existing wetlands and lakes are the most notable habitats in this planning region. CRP lands are not common. Woodside and Ranum WMAs, along with four USFWS waterfowl production areas (WPA), provide wetland and grassland habitats. The area near Union Lake and Lake Sara has the highest density of woodlands in the entire watershed.
2.3.2.1 Existing Resources

The MCEA used a variety of criteria to evaluate existing areas and resources important for plants and animals. The criteria included identifying:

- Large blocks of contiguous wetland (minimum of 100 acres), grassland (minimum of 500 acres) and woodland (minimum of 1000 acres);
- Sensitive species or Species in Greatest Conservation Need (SGCN). These are species considered rare, declining or vulnerable in Minnesota because their populations are identified as being rare, declining or vulnerable in Minnesota for a variety of reasons, including:
  - Dependence upon rare, declining or vulnerable habitats;
  - Vulnerability because of over-exploitation, invasive species, disease, contaminants or a lack of citizen understanding and stewardship (such as killing large snakes thought to be venomous);
  - Vulnerability because they require large home ranges or require multiple habitats or ecological processes, like fire, that no longer operate within the natural range of variation;
  - A limited ability to recover on their own due to low dispersal ability or low reproductive rate or have a highly localized or restricted distribution (Endemic);
  - Highly concentrated populations during some time of the year (such as bats clustering in hibernacula and migratory stop-overs);
  - Species whose Minnesota populations are stable, but are declining in a substantial part of their range outside of Minnesota (such as common loon or black tern).
- Key habitats\(^1\) based on the use of habitats by SGCN;
- Public and conservation lands (those primarily under fee ownership to the Nature Conservancy, the DNR, and the USFWS; and
- Wildlife Conservation Areas identified by resource professionals.

Figure 2.8 shows existing priority resource areas meeting the criteria for large habitat blocks of wetland, grassland and woodland within the SHRWD and Planning Region 3. Large blocks of wetland and grassland are evident throughout the planning region.

\(^1\) [http://files.dnr.state.mn.us/assistance/nrplanning/bigpicture/cwcs/chapters_appendix/tomorrows_habitat_ch7.pdf](http://files.dnr.state.mn.us/assistance/nrplanning/bigpicture/cwcs/chapters_appendix/tomorrows_habitat_ch7.pdf)
Except for Godfrey Township, there are relatively low numbers of SGCN within Planning Region 3 (Figure 2.9). There are generally less than ten species per township within the region, likely because of the intensive agricultural land use. Figure 2.10 identifies existing key habitats within the SHRWD and Planning Region 3. These are largely habitats upon which SGCN depend. The Sand Hill River is the sole key habitat within Planning Region 3. Resource professionals identified the areas the Sand Hill River as the primary wildlife conservation areas. Several public and conservation lands are located within Planning Region 3 (see Figure 2C).

2.3.2.2 Resource Enhancement Opportunities

Restorable resources are landscape features, such as: 1) partially drained wetlands; 2) drained wetlands indicated by the presence of hydric soils; 3) watercourses including creeks, streams and rivers that lack adjacent buffers (i.e., vegetation) and are unstable because of excessive migration and bank erosion; 4) corridor of woodland habitat along the Red River; 5) the channelized reaches of the Sand Hill River; 6) channelized reaches of Maple Creek; and 4) water courses listed as impaired by the Minnesota Pollution Control Agency (MPCA).

Partially drained wetland data were available in GIS polygon format from the USFWS through using the National Wetlands Inventory (NWI). These wetlands are identified with a “d” modifier in the database. Partially drained wetlands within Planning Region 3 are shown in Figure 3C.

Most watercourses within Planning Region 3 have low amounts of vegetation and, therefore, low buffer ratings. The DNR 24K stream layer was used to identify and evaluate buffer condition of segments along watercourses within the SHRWD. These stream segments were compared to 2000 Land Use/Land Cover data by the MCEA to designate each segment as a “low”, “medium”, or “high” buffer category. Those segments with adjacent barren, cropland or urban/industrial land use were designated as “low”. Those segments with adjacent hay land use were designated as “medium”. Those segments with adjacent grassland, shrub, wetland or woodland were designated as “high” buffer segments. The MCEA Natural Resource Assessment Report for the Sand Hill River documents those watercourses with a “low” buffer segments (i.e., Figure 3 in the MCEA report). The MCEA report is included as Appendix H in this WMP.
Species in greatest conservation need (SGCN) are defined as those with either extremely small populations and risks, declining or vulnerable to extinction and threats, or those whose decline or extinction would substantially diminish the region's biodiversity and ecological health.

In Minnesota, 250 species meet the definition of species in greatest conservation need (SGCN). This set of SGCNs includes mammals, birds, reptiles, amphibians, fishes, insects, and 325 animal species in Minnesota that were assessed for this project.

The number of SGCN species recorded in each township from public accurate are presented.
### 2.3.2.3 Priority Habitats

Priority sites for the protection or restoration of wetland and grassland habitats within Planning Region 3, as well as Grassland Bird Conservation Areas and other species, were identified (see Figure 2.8). These areas are for grassland bird conservation areas, pheasant priority grasslands and shorebird grassland habitats. For grassland bird conservation areas, core priority areas are ranked based upon the size and composition of the grassland area. Further, priority is indicated by an area's relative value for restoring grasslands based upon relative abundance of wintering habitat (for pheasants) and relative abundance of important habitat (for shorebirds). The priority for these rankings is based upon a scale from 1 to 100. Planning Region 3 ranks very high (approximately 55-77) in the number of priority sites located there.

---

### 3. Surface Water Resources

A summary of surface water resources within Planning Region 3 is presented within this section. The intent is to generally describe those rivers, streams, drainage systems and lakes responsible for the conveyance and storage of surface waters.

---

#### 3.1 Rivers, Streams and Tributaries

The primary river system in Planning Region 3 is the Sand Hill River. This planning region also contains several small natural tributaries to the Sand Hill River, which provide outlets for the lakes. These can be seen in Figure 4C, Water Resources of Planning Region 3.

---

#### 3.2 Drainage Systems

There are a few private drainage systems constructed since the early 1900’s to provide agricultural drainage to specific areas within Planning Region 3. Unlike the ditch systems in Planning Region 1, the systems in Planning Region 3 follow natural water courses that existed prior to their construction. There is one public (legal) drainage system in Planning Region 3. This is a joint county ditch system under the authority of the SHRWD – Project
No. 5, Polk CD No. 17 and Norman CD No. 2. Both ditch systems are under the authority of the SHRWD at this time (see Figure 4C). The benefiting area for this system begins in Norman County with the drainage flowing north in CD No. 2, and then continuing north in Polk County as CD No. 17, eventually outletting into the Sand Hill River in Garden Township.

Without the existing drainage network, comprised of both artificial and natural water courses, water would stagnate in the fields and drown crops, cause lake flooding, overtop roads. The ditch networks have, however, essentially connected areas that would otherwise not have an adequate outlet.

### 3.3 Floodplains

The Minnesota Legislature enacted the State Floodplain Management Act (Minnesota Statutes, Chapter 103F) in 1969. This Act stresses the need for a comprehensive approach to solving flood problems by emphasizing nonstructural measures, including floodplain zoning regulations, flood insurance, flood-proofing, and flood warning and response planning. By law, Minnesota's flood prone communities are required to adopt floodplain management regulations when adequate technical information is available to identify floodplain areas and enroll and maintain eligibility in the National Flood Insurance Program (NFIP) to ensure the ability to purchase flood insurance.

The MnDNR has promulgated minimum standards for floodplain management titled "Statewide Standards and Criteria for Management of Flood Plain Areas of Minnesota" (Minn. Rules 6120.5000 - 6120.6200). These standards have two direct applications: 1) all local floodplain regulations adopted after June 30, 1970 must be compliant with these standards; and 2) all state agencies and local units of government must comply with Minnesota Regulations in the construction of structures, roads, bridges or other facilities located within floodplain areas delineated by local ordinance. Local floodplain regulatory programs administered by county government (predominately for the unincorporated areas of a county) and by municipal government (for the incorporated areas of a county) must be compliant with federal and state floodplain management standards. Both federal and state standards identify the 100-year floodplain as the minimum area necessary for regulation at the local level. These regulations are intended to protect new development and modifications to existing development from flood damages when locating in a flood prone area cannot be avoided.
There are areas mapped as 100-year floodplain within Planning Region 3 along the Sand Hill River. These areas can be seen in Figure 4C.

### 3.4 Lakes

Lake water quality is important to the residents of the SHRWD. Area lakes, which can be seen in Figure 4C, are mostly located in Planning Region 3 and used for recreational opportunities, such as waterfowl hunting, fishing, and swimming. Many of these lakes also have homes located along their banks, since they are a desirable place to recreate. Quality of lake water is, thus, important to the economic progress of the areas in the SHRWD where many lakes are concentrated.

Increased demands on these water bodies, however, also leads to increased risk to water quality degradation. Some of the SHRWD lakes are already impacted, some more so than others, while some lakes have been minimally impacted. In this regard, a management framework was developed for the SHRWD to guide the management of the SHRWD's lake resources. Four possible classes were used in the management framework, which are described as follows:

- **Class I-A** – lakes moderately or highly sensitive to disturbance, with high water clarity; also, highly sensitive lakes with marginal water clarity.
- **Class I-B** – any lakes designated as impaired for stressors other than mercury.
- **Class II** – lakes moderately or highly sensitive to disturbance, with moderate water clarity.
- **Class III** – lakes with low sensitivity to disturbance, but with moderate to high water clarity.
- **Class IV** – lakes with marginal water clarity, having moderate to low sensitivity to disturbance.

Lakes in the SHRWD were screened to develop a group of priority lakes to apply and test the management framework on. Twenty-four lakes were identified through the screening process, which can be found in Table 2.2. As the table shows, there are nine lakes within Planning Region 3 that meets the screening criteria.
<table>
<thead>
<tr>
<th>Lake Name</th>
<th>ID</th>
<th>Lake Area</th>
<th>Planning Region</th>
<th>Quality</th>
<th>Sensitivity to Disturbance</th>
<th>COMBINED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allen</td>
<td>44-0157-00</td>
<td>156</td>
<td>4</td>
<td>high</td>
<td>Moderate</td>
<td>I-A</td>
</tr>
<tr>
<td>Arthur</td>
<td>60-0309-00</td>
<td>123</td>
<td>3</td>
<td>moderate</td>
<td>Moderate</td>
<td>II</td>
</tr>
<tr>
<td>Bungum</td>
<td>60-0222-00</td>
<td>67</td>
<td>3</td>
<td>moderate</td>
<td>Moderate</td>
<td>II</td>
</tr>
<tr>
<td>Cable</td>
<td>60-0293-00</td>
<td>82</td>
<td>3</td>
<td>moderate</td>
<td>Moderate</td>
<td>II</td>
</tr>
<tr>
<td>Chicog</td>
<td>60-0332-00</td>
<td>113</td>
<td>3</td>
<td>moderate</td>
<td>Low</td>
<td>III</td>
</tr>
<tr>
<td>Clydes</td>
<td>60-0117-00</td>
<td>47</td>
<td>4</td>
<td>moderate</td>
<td>Moderate</td>
<td>II</td>
</tr>
<tr>
<td>Eastland</td>
<td>44-0159-00</td>
<td>41</td>
<td>4</td>
<td>high</td>
<td>Moderate</td>
<td>I-A</td>
</tr>
<tr>
<td>Frethem</td>
<td>44-0154-00</td>
<td>65</td>
<td>4</td>
<td>marginal</td>
<td>High</td>
<td>I-A</td>
</tr>
<tr>
<td>Halverson</td>
<td>60-0228-00</td>
<td>161</td>
<td>3</td>
<td>moderate</td>
<td>Moderate</td>
<td>II</td>
</tr>
<tr>
<td>Hilligas</td>
<td>60-0093-00</td>
<td>130</td>
<td>4</td>
<td>marginal</td>
<td>High</td>
<td>I-A</td>
</tr>
<tr>
<td>Ketchum</td>
<td>44-0152-00</td>
<td>170</td>
<td>4</td>
<td>high</td>
<td>Moderate</td>
<td>I-A</td>
</tr>
<tr>
<td>Kittleson</td>
<td>60-0327-00</td>
<td>304</td>
<td>3</td>
<td>moderate</td>
<td>Low</td>
<td>III</td>
</tr>
<tr>
<td>Labrie</td>
<td>60-0071-00</td>
<td>193</td>
<td>4</td>
<td>high</td>
<td>Moderate</td>
<td>I-A</td>
</tr>
<tr>
<td>LaDuc</td>
<td>44-0151-00</td>
<td>101</td>
<td>4</td>
<td>high</td>
<td>Moderate</td>
<td>I-A</td>
</tr>
<tr>
<td>Lundby</td>
<td>60-0323-00</td>
<td>33</td>
<td>3</td>
<td>moderate</td>
<td>Moderate</td>
<td>II</td>
</tr>
<tr>
<td>Maltrod</td>
<td>60-0237-00</td>
<td>20</td>
<td>4</td>
<td>moderate</td>
<td>Moderate</td>
<td>II</td>
</tr>
<tr>
<td>Matson</td>
<td>60-0181-00</td>
<td>42</td>
<td>4</td>
<td>moderate</td>
<td>Moderate</td>
<td>II</td>
</tr>
<tr>
<td>Newton</td>
<td>60-0145-00</td>
<td>46</td>
<td>4</td>
<td>moderate</td>
<td>High</td>
<td>II</td>
</tr>
<tr>
<td>Rindahl</td>
<td>60-0238-00</td>
<td>54</td>
<td>4</td>
<td>moderate</td>
<td>High</td>
<td>II</td>
</tr>
<tr>
<td>Sand Hill</td>
<td>60-0069-00</td>
<td>598</td>
<td>4</td>
<td>marginal</td>
<td>High</td>
<td>I-A</td>
</tr>
<tr>
<td>Sarah</td>
<td>60-0202-00</td>
<td>366</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simonson</td>
<td>44-0162-00</td>
<td>137</td>
<td>4</td>
<td>high</td>
<td>Moderate</td>
<td>I-A</td>
</tr>
<tr>
<td>Strand</td>
<td>60-0116-00</td>
<td>28</td>
<td>4</td>
<td>impaired</td>
<td>High</td>
<td>I-B</td>
</tr>
<tr>
<td>Union</td>
<td>60-0217-00</td>
<td>910</td>
<td>3</td>
<td>moderate</td>
<td>Moderate</td>
<td>II</td>
</tr>
</tbody>
</table>
3.5 MnDNR Protected Waters

Minnesota Statutes, Chapter 103G, establishes the Protected Waters Permit Program. Under this program, approval must be obtained from the MnDNR, Division of Waters, before work begins on any project that affects the bed of a protected water or wetland. Protected waters within Planning Region 3 can be found in Figure 4C. Water courses identified as Protected Waters include the Sand Hill River.

There are many Protected Water Bodies within Planning Region 3. These would include all lakes, ponds, wetlands, etc. as shown on Figure 4C.

3.6 Wetlands

Surface waters defined as wetlands are protected by a myriad number of laws. At the state level, counties have responsibilities specified by the Wetland Conservation Act (WCA). Under the direction of the BWSR, counties and other designated local governments are responsible for regulating projects that propose to drain or fill wetlands. Enacted in 1991, the WCA is intended to fill gaps in wetland protection left by other state and federal programs. In addition, the WCA is intended to ensure a “no net loss” in existing wetlands. Under the WCA, the responsible local government is outside of the seven county metropolitan area is a county or a city, and in the seven-county metropolitan area is a city, a town or a water management organization. However, soil and water conservation districts (SWCD) are also involved in the program through landowner assistance and record keeping. Many counties have delegated administration of the WCA to their SWCD. Finally, the State is responsible for applying the WCA to state projects or to activities on state land.

Federal laws also apply to wetlands. Sections 404 and 401 of the Clean Water Act (CWA) provide for the regulation of wetland and water impacts. Section 404 regulates the discharge of dredge or fill material into waters of the United States, making it unlawful to discharge dredged or fill materials without first obtaining a permit. The Environmental Protection Agency (EPA) has overall responsibility for the CWA, but the U.S. Army Corps of Engineers (USACE) has primary responsibility for administering and enforcing section 404.
Section 401 emphasizes water quality and sets up a water quality certification program. Under the guidance of the EPA, the MPCA administers the Minnesota program and reviews section 404 permit applications sent to the USACE that may result in the degradation of water quality in wetlands.

Swampbuster is a program of the 1985 Food Security Act, amended by the 1990 and 1996, and 2008 farm bills. Under this program, farmers who impact wetlands become ineligible for certain federal government price and income support programs. The U.S. Department of Agriculture (USDA), through the Natural Resources Conservation Service (NRCS) and Farm Service Agency (FSA) administer this program.

Planning Region 3 has a total of 6,120 acres of wetlands, which is approximately 14.25% of the Planning Region’s area. Riverine wetlands are negligible. Wetlands of Planning Region 3 can be found in Figure 4C. Planning Region 3 falls entirely within Polk County. Polk County is classified as having less that 50% of pre-settlement wetlands remaining, for the purposes of the State BWSR WCA.

4. Groundwater Resources

The Sand Hill River basin consists of glacial lake deposits, lake shore deposits, till and a small amount of ice-contact deposits overlying the bedrock. Bedrock in the east part of the basin consists of Precambrian, undifferentiated igneous, and metamorphic rock. Bedrock in the west part of the basin consists of a small band of Cretaceous, fine-grained sandstone and shell. Clay and silt lake deposits dominate the Lake Agassiz plain bordering the Red River. A transition zone between the lake plain and the glacial moraine areas is formed by lake shore deposits, delta sand, and gravel.

There are two aquifer systems of note within Planning Region 3, a deep aquifer and a shallow aquifer. The deep aquifer is the Cretaceous aquifer, and it is located in the western portion of the region. Depths to the aquifer are approximately between 200-600 feet below mean sea level. This aquifer is predominant in the eastern portion of the SHRWD. The shallow aquifer is a glacial drift aquifer, and it is distributed throughout the
SHRWD. As little as 20 feet or less of till overlie some of these areas. The amount and type of material overlying an aquifer is important because it largely determines recharge characteristics, the potential for contamination, and the degree of interaction with surface waters. Glacial drift aquifers within the SHRWD may be surficial and unconfined, meaning an impervious layer above the aquifer is absent and the water table is in equilibrium with the atmosphere. Alternatively, glacial drift aquifers may be buried. Buried aquifers are typically confined by an impermeable layer of material above them, less susceptible to potential contamination and at a pressure greater than atmospheric. Buried aquifers are rare within the District.

The shape of glacial drift aquifers within the District is typically long and narrow, oriented north and south along a beach ridge. Aquifer thickness varies from 10 to 50 feet and potential yields range from 10 to 500 gallons per minute. The flow direction of both deep and shallow aquifers is generally towards the west-northwest to the Red River.

A groundwater sensitivity to pollution of the shallow systems in the area was produced by the Minnesota Department of Natural Resources, based upon the water table depths and soil textures, and this is included as Figure 2.12. It can be seen that the glacial moraine area of Planning Region 3 has the moderate to high sensitivity to pollution.

5. Water Supply and Use and Water Treatment

5.1 Municipal Drinking Water

The Minnesota Department of Health (MDH) has completed source water assessments for all the public water systems in the state, as required by the 1996 amendments to the Federal Safe Drinking Water Act. A source water assessment is a document produced by MDH staff and is intended to provide basic information to the public water suppliers and the general public regarding: 1) where their drinking water comes from and 2) the degree to which it may be impacted by potential sources of contamination. Individual water users in Planning Region 3 derive their drinking water from ground water sources. Further,
Minnesota statute 103G.265 requires the MnDNR to manage water resources to ensure an adequate supply to meet long-range seasonal requirements for domestic, agricultural, fish and wildlife, recreational, power, navigation, and quality control purposes. The water appropriation permit program exists to balance competing management objectives that include both development and protection of Minnesota’s water resources. Permits are required when the withdrawal of water exceeds 10,000 gallons per day or 1 million gallons per year.

There are no cities with a MDH source water assessment and MnDNR appropriation water permits Planning Region 3.

Wellhead protection is a way to prevent drinking water from becoming polluted by managing potential sources of contamination in the area that supplies water to a public well. The wellhead protection plan is a separate document than the source water assessment, and it is developed by the water system and its wellhead protection planning team. A wellhead protection plan has not been produced by any entity in Planning Region 3 yet, but all groundwater based community and non-transient non-community public water systems should have begun the wellhead protection planning process by 2006. The Wellhead Protection Area (WHPA) for the regional aquifer is outside Planning Region 3 boundaries. A map showing WHPA’s in the vicinity of the SHRWD can be seen as Figure 2.11.

5.2 Water Use

There are no agricultural permittees in Planning Region 3 with MnDNR appropriation water permits. Other withdrawals not requiring a MnDNR permit also certainly exist, as there are several exemptions to water appropriation permit requirements, which are:

- Domestic uses serving less than 25 persons for general residential purposes;
- Test pumping of a groundwater source;
- Reuse of water already authorized by a permit; or
- Certain agricultural drainage systems
Figure 2.11: Wellhead Protection Areas

This map shows the Wellhead Protection Areas (WPAs) established by the Minnesota Pollution Control Agency (MPCA) to protect public water supplies. WPAs are areas where activities are restricted to prevent contamination of groundwater and surface water supplies. The map highlights regions with WPAs, which are defined as areas surrounding a public water supply well or well field that supplies a public water system. Groundwater and surface water in these areas may be vulnerable to pollution from activities such as land use, agricultural practices, and other forms of contamination.
5.3 Inventory of Surface Water Dischargers

There are no communities in Planning Region 3 having municipal sewerage systems that are National Pollutant Discharge Elimination System (NPDES) permitted facilities. In much of the SHRWD, construction of individual sewage treatments systems (ISTS) requires care in siting and design, due to the fact that the tight clay soils restrict the percolation of water.

6. Business Sectors

The landscape within Planning Region 3 is dominated by private lands in agricultural production with intensive row crop agriculture, scattered forests, and lakes. The farms in Planning Region 3 tend to concentrate on cash crops and livestock production.

6.1 Agriculture

Principal crops grown include small grains, soybeans, sunflowers, and corn. Figure 2.7 shows the location of prime farmland located within Planning Region 3, according to the Minnesota Center for Rural Policy and Development. The average farm size in Polk County in 2007 was 684 acres.

6.2 Other Important Industries

The land use in Planning Region 3 is primarily agricultural. Planning Region 3 has limited processing and manufacturing industries. The main employment industry is agriculture.
6.3 Recreation and Tourism

Most of the recreational opportunities are associated with hunting deer, small game, pheasant and waterfowl. The Sand Hill River has the potential for fishing opportunities throughout the Planning Region. The lakes in Planning Region 3 are a popular recreation destination.

7. Description of Completed Projects

Since inception, the SHRWD has implemented a variety of programs, and constructed many projects, to address resource management issues. Projects have been implemented under Minnesota Statutes 103D (Watershed District Law) and Minnesota Statute 103E (Drainage Law). Table 3C identifies the completed projects in Planning Region 3.
<table>
<thead>
<tr>
<th>Management Area</th>
<th>Approximate Location (Planning Region or District-wide)</th>
<th>Issues</th>
<th>Potential Solutions</th>
<th>Project/Area</th>
<th>Est. Budget</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural drainage systems</td>
<td>Planning Region 3</td>
<td>Ditch system degradation</td>
<td>Ditch repair and maintenance</td>
<td>Project No. 5, Polk CD 17 an Norman CD 2</td>
<td>15,000</td>
<td>Completed in 1981</td>
</tr>
<tr>
<td>River channel maintenance</td>
<td>Planning Region 2 and 3</td>
<td>Debris obstruction channel</td>
<td>Debris removal</td>
<td>Debris removal from Sand Hill River in Sections 18, 19 and 29 if Garfield Township</td>
<td>5,000</td>
<td>Completed in 1998</td>
</tr>
<tr>
<td>Water Quality</td>
<td>Planning Region 1, 2, 3, and 4</td>
<td>Sand Hill River water quality degradation</td>
<td>Collect and monitoring water quality data, investigate possible solutions.</td>
<td>River Watch Program</td>
<td>40,000</td>
<td>On-going</td>
</tr>
<tr>
<td>Water based recreation and habitat</td>
<td>Planning Region 3</td>
<td>Water level flooding and lake access issues</td>
<td>Possible lake level stabilization strategies</td>
<td>Union Lake and Lake Sarah Water Level Study</td>
<td>10,000</td>
<td>Completed by Polk County</td>
</tr>
<tr>
<td>Flood damage reduction, rate of runoff, volume of runoff</td>
<td>Planning Region 2 and 3</td>
<td>Flooding problems along downstream Maple Creek</td>
<td>Water diversion</td>
<td>Project No. 7, Maple Creek Diversion</td>
<td>20,000</td>
<td>Not completed</td>
</tr>
<tr>
<td>Flood damage reduction, rate of runoff, volume of runoff</td>
<td>Planning Region 3</td>
<td>Reduction of upstream erosion and reduction of sediment inflow to Union Lake</td>
<td>Floodwater storage</td>
<td>Project No. 19, Union Lake Detention Study</td>
<td>20,000</td>
<td>Not completed</td>
</tr>
<tr>
<td>Erosion and lake sedimentation</td>
<td>Planning Region 3</td>
<td>Reduction of upstream erosion and inflow of sediment to Union Lake</td>
<td>Erosion control grade structures, CRP utilization, etc.</td>
<td>Union Lake Erosion Control Project</td>
<td>80,000</td>
<td>Completed in 2006</td>
</tr>
</tbody>
</table>
8. Assessment of Resource Issues and Problems

The issues and problems within Planning Region 2 can generally be placed into “management” categories. These categories are:

- Floodplain management;
- Flood damage reduction, rate of runoff, volume of runoff;
- Agricultural drainage systems;
- Water quality;
- Wetlands;
- Natural resources and recreation;
- Groundwater;
- Erosion and sediment control;
- Education;
- Long range work planning and financing; and
- Data Collection and Management

Many information sources were used to identify the resource issues and problems within Planning Region 2. These information sources include the knowledge of SHRWD staff, Project Team (PT) meetings conducted as part of the Red River Flood Damage Reduction Mediation Agreement process, completed reports and studies, GIS analysis, an analysis of the location of previously completed projects, and public input meetings conducted within Planning Region 2. Some of the issues and problems are District-wide, while others are specific to Planning Region 2.
8.1 Issues and Problems

A variety of issue and problems have been identified within Planning Region 3 (Table 4C). This section presents a summary of these issues and problems by management category. Figure 5C shows the location of the resource issues and problem areas within Planning Region 3. Only Planning Region specific items will be discussed in the summary that follows the table.
## Table 4C. Issues and Problems in Planning Region 3.

<table>
<thead>
<tr>
<th>Management Area</th>
<th>Approximate Location (Planning Region or District-wide)</th>
<th>Issues</th>
<th>Potential Solutions</th>
<th>Project/Area</th>
<th>Source</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural drainage systems</td>
<td>Planning Region 3</td>
<td>Out of date benefits and on-going maintenance</td>
<td>Redetermination of benefits as needed. Conduct active ditch maintenance program</td>
<td>Polk CD 17 and Norman CD 2</td>
<td>Regional meetings; landowner input</td>
<td></td>
</tr>
<tr>
<td>Water quality</td>
<td>Planning Regions 1, 2, 3 and 4, and District-wide</td>
<td>Lack of evaluation of impaired waters</td>
<td>Investigate and monitor potential impaired water bodies; use of non-point source computer models</td>
<td>TMDL process (esp. for SHR main stem); River Watch program; 319 Grant computer modeling; CWL monitoring</td>
<td>PT minutes; MPCA initiative with SHRWD on TMDL watershed-wide study</td>
<td>In progress</td>
</tr>
<tr>
<td>Erosion and sediment control</td>
<td>Planning Region 3</td>
<td>Erosion and sedimentation; channel degradation; esp. along Sand Hill River, ditches, and streams</td>
<td>Set aside land; channel restoration; in-channel rock stabilization structures; bank stabilization measures; buffer strips; conservation tillage; side inlet controls</td>
<td>Sand Hill River and all channels within the region. Seek cooperative assistance form SWCD</td>
<td>PT minutes; Regional Meeting; Public Comments</td>
<td>In progress</td>
</tr>
<tr>
<td>Erosion and sediment control</td>
<td>Planning Region 3</td>
<td>Field and channel erosion; bank stability</td>
<td>Increase buffer strips along the ditch systems; water retention; conservation tillage; ditch improvements</td>
<td>Planning Region 3 ditch systems all inclusive</td>
<td>Regional Meeting; Public Comments; Staff assessment</td>
<td></td>
</tr>
<tr>
<td>Planning Region 3 Planning Summary (January 2012)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Erosion and sediment control</strong> District-wide</td>
<td><strong>Erosion</strong></td>
<td>Use federal funding to encourage land owners to set aside land from production</td>
<td>Buffer strip Initiative; CREP; RIM; CRP; WREP; CP 34; RRBBI; NAWCA; SWCD initiatives</td>
<td>PT minutes; SWCD input; Regional meetings</td>
<td>In progress as needed</td>
<td></td>
</tr>
<tr>
<td><strong>Education</strong> District-wide</td>
<td><strong>Lack of awareness of water issues on the part of the general public (importantly, the future generation)</strong></td>
<td><strong>Educate students on water resources issues</strong></td>
<td><strong>Water monitoring involvement for local schools</strong></td>
<td><strong>PT minutes; River Watch cooperation</strong></td>
<td><strong>In progress</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Floodplain management</strong> District-wide</td>
<td><strong>FEMA/FIS and RRBI</strong></td>
<td><strong>Maintain floodway</strong></td>
<td><strong>Public education</strong></td>
<td><strong>Staff assessment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Long range work planning and financing</strong> District-wide</td>
<td><strong>Need to update and revise a Watershed Management Plan</strong></td>
<td><strong>Hydrologic modeling; plan update process; Systems Approach</strong></td>
<td><strong>District-wide</strong></td>
<td><strong>PT minutes; Staff assessment</strong></td>
<td><strong>In progress</strong></td>
<td></td>
</tr>
<tr>
<td>Data collection and management</td>
<td>District-wide</td>
<td>Lack of high-quality digital elevation data</td>
<td>Collect high-quality digital data</td>
<td>Red River Basin Mapping Initiative</td>
<td>PT minutes</td>
<td>In progress</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>---------------</td>
<td>------------------------------------------</td>
<td>---------------------------------</td>
<td>----------------------------------</td>
<td>------------</td>
<td>------------</td>
</tr>
<tr>
<td>Correct boundaries between adjacent watershed districts</td>
<td>Collect high-quality elevation data via LiDAR and coord. with RLWD and WRWD</td>
<td>Along watershed boundaries with RLWD and WRWD</td>
<td>Inter-watershed district coordination</td>
<td>In progress</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Planning Region 3 Planning Summary (January 2012)**
8.1.1 Floodplain Management
No issues or problems related to floodplain management were identified within Planning Region 3.

8.1.2 Flood Damage Reduction, Rate of Runoff, Volume of Runoff
There are very few issues or problems related to flood reduction in Planning Region 3. Rate of runoff becomes an issue in the planning region when it results in stream bank erosion and resulting sedimentation in downstream lakes and streams.

8.1.3 Agricultural Drainage Systems
Grassed buffer strips, piped side inlets, and erosion control structures are several of the management measures being investigated to stop downstream sedimentation.

8.1.4 Water Quality
Water quality has been brought up repeatedly during planning team meetings and Planning Region 3 was no exception. This is a rural area issue, and areas that need to be addressed are along the Sand Hill River and in the region’s lakes, from a Region 3 perspective. It is a regional concern that exotic and invasive species threaten the ecological integrity of the region’s lakes and streams. Water quality has been linked to other resource issues within the planning region, including; wind erosion, water erosion, degradation of natural fish habitat, and degradation of recreational opportunities. Since water quality has been discussed in many planning team meetings, it is a high priority issue.

The entire Sand Hill River in Planning Region 2 is listed on the MPCA’s impaired waters list. The stressor causing impairment is turbidity and low dissolved oxygen. Aquatic life is the beneficial use that is affected (see Table 3.1 and Figure 3.1). Table 3.1 is reproduced herein for reference. The SHRWD is currently entering into a contract with the MPCA to conduct a basin-wide TMDL study. The target completion date for the TMDL is 2015.
Table 3.1 – Impaired waters within the SHRWD based on the 2010 MPCA 303(d) List.

<table>
<thead>
<tr>
<th>Impaired Water</th>
<th>Assessment Unit ID</th>
<th>Year Listed</th>
<th>Affected Use</th>
<th>Pollutant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sand Hill, River Headwaters to Kittleson Creek Planning Region 3</td>
<td>09020301-509</td>
<td>2010*, 2008</td>
<td>Aquatic Life</td>
<td>Turbidity, Dissolved Oxygen</td>
</tr>
<tr>
<td>Sand Hill River, Unnamed Creek to Red River</td>
<td>09020301-537</td>
<td>2010*</td>
<td>Aquatic Life</td>
<td>Turbidity</td>
</tr>
<tr>
<td>Red River of the North, Marsh River to Sand Hill River</td>
<td>09020301-506</td>
<td>1998, 2002</td>
<td>Aquatic Consumption</td>
<td>Mercury, PCBs</td>
</tr>
<tr>
<td>Red River of the North, Sand Hill River to Buffalo Coulee (ND)</td>
<td>09020301-507</td>
<td>1998, 2002, 2008</td>
<td>Aquatic Consumption, Aquatic Life</td>
<td>Mercury, PCBs, Turbidity</td>
</tr>
</tbody>
</table>

*Impaired waters listed in 2010 are considered draft listings at the time of this WMP publication, until approved by US EPA TMDL Start/Completion as listed in the Draft 2010 impaired waters listing

8.1.5 Wetlands

No specific issues or problems related to the quantity or quality of wetlands were identified within Planning Region 3. Resource agencies have generally indicated that efforts related to wetlands should be seriously looked at in Region 3, as well as other areas within the SHRWD. The comments received at the regional planning meeting indicated a concern for the ecological integrity of streams and lakes, and presumably this includes the role of wetlands. The number of acres of various types of habitat is considered insufficient.

8.1.6 Natural Resources and Recreation

Two issues or problems related to natural resources and recreation were identified within both Planning Regions 1 and 2.
8.1.7 Groundwater

No issues or problems related to groundwater were identified within Planning Region 3. The SHRWD is watching closely the ongoing research and development of tile drainage technology for purposes of future regulation and management.

8.1.8 Erosion and Sediment Control

Issues or problems related to erosion and sediment control were identified at several locations within Planning Region 3. The issues and problems were identified as follows:

- Erosion of susceptible soils and slopes throughout the region, causing sheet and rill erosion;
- Field and channel erosion and bank stabilization in Planning Region 3 ditch systems;
- Sedimentation within the region’s lakes (i.e., Union Lake) and streams.

The sedimentation issues associated with Union Lake are serious and have been of long term concern. The SHRWD has been very active in addressing these issues in past years. Most recently an erosion control project was constructed by the District on a major inlet channel to the lake.

8.1.9 Education

No issues or problems related to education have been identified within Planning Region 3.

8.1.10 Long Range Work Planning and Financing

No issues or problems were identified relative to Long Range Work Planning and Financing. The SHRWD will continue Long Range Work Planning efforts and will identify outside sources of funding to help finance projects and programs. Examples of successful financial partnerships included the DNR financing for fish passage master planning and projects, the current MPCA financing of a basin-wide TMDL study, the leveraging of DNR Flood Damage Reduction funds for community flood protection for Climax and Nielsville, and leveraging of NRCS funding for three farmstead ring dikes.

8.1.11 Data Collection and Management

Although no issues or problems were identified relative to Data Collection and Management, the SHRWD generally lacks sufficient funding to implement a data collection and monitoring program. The District, through this planning process, is identifying potential locations called regional assessment
locations (RALs) as future locations for collecting stage, flow, water quality and other relevant information.
9. Planning Region 3 Goals

This section presents a summary of goals that are directly linked to the issues and problems by management category.

9.1 Measurable Goals

9.1.1 Floodplain Management Goals

Goal: Opportunistically manage floodplains for multiple, non-development use.

Policy FM-1: Maintain established (adopted) requirements for floodplain management (including floodplain alterations, development within floodplains, minimum building elevations) implemented through zoning and land use controls at the local level.

Action: Recommend development in floodplain areas meet the current floodproofing requirements.
Status: Ongoing.

Policy FM-2: Manage floodplains in a manner that reflects the rate and volume of runoff from ultimate development.

Action: Develop information about peak discharges and runoff volumes reflective of existing development using the District’s hydrologic model in support of those responsible for implementing the floodplain management program at the local level. Status: Completed in 2009.

Action: Assist in the development of peak discharges and runoff volumes reflective of ultimate development in support of those responsible for implementing the floodplain management program at the local level. Status: Ongoing, as needed.
**Policy FM-3**: Incorporate appropriate opportunities for multiple floodplain uses (e.g., green space, recreation, and ecological enhancement) on District projects.

*Action*: Maintain the most recent FEMA floodplain boundaries on the District web site. **Target Date for Completion**: 2011.

*Action*: Use mapping resources of the District to identify floodplain areas along drainage and natural waterway systems, in need of restoration / maintenance as riparian corridors. Note: some of these areas may not be within FEMA floodplain boundaries. **Target Date for Completion**: 2015.

**Policy FM-4**: Educate public officials and the citizens of the SHRWD on the importance floodplain management and flood proofing measures.

*Action*: Provide information and guidance to public officials and citizens to ensure sound floodplain management. **Status**: Ongoing.

**Policy FM-5**: The District will assist in using the latest technology (i.e., LiDAR topography) in establishing flood plain delineations and elevations. **Status**: Ongoing.

### 9.1.2 Flood Damage Reduction Goals

*Goal*: Minimize existing and future potential damages to property, public safety, and water resources due to flood events in urban and agricultural areas.

**Policy FDR-1**: Attempt to maintain the post-development 2-year, 10-year and 100-year peak rate of runoff at or below the pre-development level for the critical duration precipitation event, both on-site and at key regional locations identified by the District and within incorporated cities.

*Action*: Develop a culvert inventory of culverts on all natural and artificial (including legal drainage ditches) for Planning Region 1. The inventory will include culvert/bridge standard sizes, dimensions and waterway areas, invert elevations (flow line elevations referenced to 1988 USGS Datum MSL). The District will finance this data collection effort with grants or other means. **Target Date for Completion**: 2015.
Action: Use (at a minimum) the most downstream locations within the regional planning units as the key regional locations. Status: Completed with the Establishment of Regional Assessment Locations (RAL).

Action: Compensate impacted landowners for damage if peak reduction actions cannot be done (mitigation). Status: Ongoing, as needed.

Action: Provide technical assistance to cities needing information about peak discharge and runoff volumes or other hydrology related information. Status: Ongoing, as needed.

Policy FDR-2: Use consistent design standards, evaluation tools, and performance measures for managing urban stormwater runoff.

Action: Size stormwater conveyance and detention facilities in accordance with the need to protect infrastructure such as roads and utilities, and maximize safety. Status: Ongoing.

Policy FDR-3: Reduce the likelihood of exacerbating downstream flood damages by controlling, where feasible, the peak discharges and runoff volumes for areas subject to frequent flooding within the District.

Action: Map areas within the District subject to frequent flooding and identify the recurrence interval, duration and severity of flooding. Status: Ongoing, as needed.

Action: Identify the hydrologic conditions (e.g., peak flow rates, subwatersheds contributing the greatest proportion of the peak discharge) for the areas mapped. Status: Ongoing.

Action: Complete hydrologic and hydraulic modeling to assess the relationship between peak discharges, runoff volumes, and areas subject to flooding. Status: Ongoing.

Action: Establish desired future conditions for peak flows and runoff volumes, as goals for reducing the size of areas subject to flooding at RALs and additional locations as determined necessary in the future. Status: Completed in 2011 – see Table 5.3 and 5.4

Action: Complete hydrologic and hydraulic modeling to assess flows at critical regional crossings and locations. Status: Ongoing.
Table 5.3 Runoff Volume Reduction Goals

<table>
<thead>
<tr>
<th>Planning Region/Major Sub-basin</th>
<th>Runoff Volume Reduction (Acre-feet)</th>
<th>Drainage Area (Acres)</th>
<th>Runoff Volume Reduction (Inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning Region 1</td>
<td>890</td>
<td>106,411</td>
<td>0.1-0.5</td>
</tr>
<tr>
<td>Planning Region 2</td>
<td>1,910</td>
<td>45,872</td>
<td>0.5-1.0</td>
</tr>
<tr>
<td><strong>Planning Region 3</strong></td>
<td><strong>3,590</strong></td>
<td><strong>43,045</strong></td>
<td><strong>1.0-1.5</strong></td>
</tr>
<tr>
<td>Planning Region 4</td>
<td>23,500</td>
<td>112,628</td>
<td>2.5 – 3.0</td>
</tr>
</tbody>
</table>

Note: Runoff Volume Reduction based on 100-year flood event.

Table 5.4 Existing and Desired Future Conditions Peak Discharges

<table>
<thead>
<tr>
<th>RAL ID</th>
<th>Indicator</th>
<th>Units</th>
<th>Rainfall Event</th>
<th>10-yr, 24-hr</th>
<th>100-yr, 24-hr</th>
<th>10-yr, 10-day</th>
<th>100-yr, 10-day</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHR-1</td>
<td>event peak discharge (cfs)</td>
<td>Existing</td>
<td>931</td>
<td>2509</td>
<td>866</td>
<td>2280</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>DFC</td>
<td>605</td>
<td>1631</td>
<td>563</td>
<td>1482</td>
<td></td>
</tr>
<tr>
<td>SHR-2</td>
<td>event peak discharge (cfs)</td>
<td>Existing</td>
<td>279</td>
<td>873</td>
<td>325</td>
<td>1021</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>DFC</td>
<td>181</td>
<td>567</td>
<td>211</td>
<td>664</td>
<td></td>
</tr>
<tr>
<td>KC-1</td>
<td>event peak discharge (cfs)</td>
<td>Existing</td>
<td>152</td>
<td>451</td>
<td>104</td>
<td>333</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>DFC</td>
<td>100</td>
<td>293</td>
<td>68</td>
<td>216</td>
<td></td>
</tr>
<tr>
<td>SHR-3</td>
<td>event peak discharge (cfs)</td>
<td>Existing</td>
<td>283</td>
<td>834</td>
<td>324</td>
<td>959</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>DFC</td>
<td>184</td>
<td>542</td>
<td>211</td>
<td>623</td>
<td></td>
</tr>
<tr>
<td>SHR-4</td>
<td>event peak discharge (cfs)</td>
<td>Existing</td>
<td>285</td>
<td>837</td>
<td>325</td>
<td>962</td>
<td></td>
</tr>
<tr>
<td><strong>Planning Region 3</strong></td>
<td></td>
<td>DFC</td>
<td>185</td>
<td>544</td>
<td>211</td>
<td>625</td>
<td></td>
</tr>
<tr>
<td>SHR-5</td>
<td>event peak discharge (cfs)</td>
<td>Existing</td>
<td>284</td>
<td>821</td>
<td>321</td>
<td>937</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>DFC</td>
<td>185</td>
<td>534</td>
<td>209</td>
<td>609</td>
<td></td>
</tr>
<tr>
<td>SHR-6</td>
<td>event peak discharge (cfs)</td>
<td>Existing</td>
<td>233</td>
<td>619</td>
<td>211</td>
<td>564</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>DFC</td>
<td>151</td>
<td>402</td>
<td>137</td>
<td>367</td>
<td></td>
</tr>
</tbody>
</table>

**Action:** Identify and preserve critical areas necessary for the temporary storage of runoff. **Target Date for Completion:** 2020.

**Action:** Identify and preserve critical areas necessary for the conveyance of stormwater runoff. **Status:** Ongoing.

**Policy FDR-4:** Protect waterways from channel instability induced by runoff, especially when used as an outlet for urban or agricultural drainage systems.
**Action:** Identify priority areas for protection and restoration of waterways within Planning Region 3 (i.e., the Sand Hill River). **Target Date for Completion:** 2020.

**Policy FDR-5:** Adopt the flood damage reduction goals established by the Flood Damage Reduction Mediation Agreement into District planning, programs and the development of projects. **Status:** Completed.

**Policy FDR-6:** Plan, design, and construct projects for local flood damage reduction benefits, while considering and targeting an optimum portion of the Red River mainstem contribution to flooding and flood damages from the District. (The Red River Basin Commission’s (RRBC) MIKE 11 model provides some indication of the Sand Hill River’s “fair share” portion of the Red River mainstem contribution to flooding).

**Action:** Complete hydrologic modeling to establish target peak discharges for the contribution of the SHRWD to the Red River Mainstem. **Status:** Completed in 2009.

**Action:** Use the target peak discharges as an evaluation criteria when planning, developing, and designing projects and implementing programs. **Status:** Ongoing.

**Action:** Use the technical tools developed by the RRWMB and IWI to evaluate the main stem value of flood damage reduction projects. **Status:** Ongoing.

**Policy FDR-7:** Plan, design, and construct projects for a minimum 35% reduction in flood discharges during the 100-year flood event at the outlet of the Sand Hill River. **Status:** Ongoing.

**Action:** Development of projects that contribute to runoff reduction goals at the Sand Hill River outlet is somewhat limited within Planning Region 3. However, smaller FDR projects with primarily local benefits are being pursued where feasible. **Status:** Ongoing.

**Action:** Complete hydrologic modeling to determine estimated project FDR benefits. **Status:** Ongoing as projects develop.

**Action:** Monitor to determine whether FDR activities are having benefit of reducing peak discharges at RAL locations. **Status:** Ongoing.

**Action:** Establish Water Management Districts or other funding alternatives to assist in financing Flood Damage Reduction Projects. **Status:** Ongoing, as needed.
9.1.3  Legal Drainage System Goals

Goal: Manage legal drainage systems in accordance with MSA 103E, while recognizing the need for agricultural drainage and sensitivity to environmental concerns

Policy LDS-1: Maintain or reduce the 2-year and the 10-year peak rates of runoff at Regional Assessment locations in Planning Region 3, at pre-improvement levels for the critical duration precipitation events when improving and establishing legal drainage systems.

Policy LDS-2: Use consistent technical standards, evaluation tools and performance measures for designing and evaluating the effects of agricultural drainage systems, including the adequacy of the outlet.

Action: Establish design standards for the repair, maintenance, improvement, and establishment of agricultural drainage systems within the District. Target Date for Completion: 2015.

Action: Determine specific technical criteria to be used in quantifying the adequacy of an outlet when improving or designing public and private drainage systems. Target Date for Completion: 2015.

Action: Identify legal drainage systems not in compliance with buffer strip requirements and work toward moving these systems into compliance in accordance with M.S.A. 103E.021. Status: Ongoing.

Policy LDS-3: Ensure lands deriving benefit from legal drainage systems are included within the benefited area of the legal drainage system and are fairly assessed relative to all properties within the benefited area.

Action: Map legal drainage systems including their benefited areas. Status: Completed.

Action: Periodically compare maps of the benefited areas for legal drainage systems and parcel data to the detailed hydrologic (drainage) boundaries maintained by the District. Status: Ongoing.

Action: Complete redetermination of benefits where needed in accordance with M.S.A. 103E.351. Status: Ongoing.

Policy LDS-4: Pursue outside funding and modernize historic drainage system records in accordance with BWSR standards.
Action: Modernize drainage records to a digital format. **Status: Ongoing.**

**Action:** Pursue outside funding for drainage record modernization. **Status: Completed.**

**Policy LDS-5:** Complete inspections of existing legal ditch systems as necessary.

Action: Complete the annual buffer strip report as required by MSA 103E.067. **Status: Completed Annually.**

### 9.1.4 Water Quality Goals

**Goal:** Maintain and, where practical, improve the water quality of rivers, stream, lakes, and groundwater resources within the District.

**Policy WQ-1:** Manage lake water quality expectations consistent with present and reasonably foreseeable landscape conditions.

Action: Establish programs and activities for addressing lake water quality issues within the District, complimentary and consistent with, but not duplicative of, existing programs, including, monitoring and use of MPCA’s Citizen Lake-Monitoring Program (see [http://www.pca.state.mn.us/water/clmp.html](http://www.pca.state.mn.us/water/clmp.html)).

Action: Use a classification method to identify “priority” lakes within the District as a method to focus the expenditure of District resources. **Status: Ongoing.**

Action: Utilize monitoring data to establish an attainable range for lake water quality in District lakes. **Status: To be determined through TMDL Study process.**

Action: Establish numeric lake water quality goals and nutrient loading rates consistent with these goals. **Status: To be determined by TMDL Studies.**

Action: Prepare lake-specific management plans as a tool for managing lakes working with PCA, DNR, and local lake management organizations. **Status: Ongoing, as needed.**

**Policy WQ-2:** Lead the development of portions or all of the TMDLs needed for waters listed as impaired within the SHRWD, provided the financial burden is fairly shared between the State of Minnesota and the District.
**Action:** Discuss options with the MPCA for leading TMDL efforts in the District. **Status:** Ongoing.

**Action:** Use resources to assist with and confirm listed waters within the SHRWD. **Status:** Ongoing.

**Action:** Develop a Water Quality Monitoring Program plan. **Status:** Ongoing.

**Action:** Evaluate MPCA priorities for TMDL completion to ensure consistency with District priorities and establish a mutually agreed upon priority list. **Target Date for Completion:** 2014.

**Action:** Determine financial considerations for TMDL completion. **Status:** Ongoing.

**Action:** Investigate the potential of having the MPCA add sites within the bounds of the District for monitoring long-term water quality trends (RALs). **Status:** Completed.

**Policy WQ-3:** Use design criteria and performance standards to ensure appropriate BMPs for mitigating landuse impacts to surface and groundwater resources.

**Action:** Reduce erosion and sedimentation in water courses and wetlands. **Status:** Ongoing.

**Action:** Reduce wind erosion. **Status:** Ongoing.

**Action:** Establish additional measures necessary to protect unique or high quality water resources within the District. **Status:** Ongoing, as needed.

**Policy WQ-4:** Use innovative methods and techniques to maintain and improve water quality when appropriate.

**Action:** Develop a cost-sharing program to encourage the use of innovative or demonstration technologies. **Target Date for Completion:** 2020.

**Action:** Develop and implement water management districts as a finance mechanism for water quality programs. **Status:** Implement, as needed.

**Action:** Develop a water quality monitoring program cost sharing document to aid in improving consistency of monitoring efforts and target monitoring efforts towards generating data that will aid in investigating issues in the District. **Target Date for Completion:** 2013.
**Policy WQ-5**: Recognize the inherent variability in water quality concentrations and loads when managing surface and groundwater resources.

**Action**: Use monitoring data to aid in establishing subwatershed annual load values reflective of variability in climate and land use. **Status**: Anticipated to be developed through TMDL process.

**Policy WQ-6**: Promote the use of BMPs in areas of agricultural land use, especially in those areas with sensitive ground water and surface water resources.

**Action**: Obtain the technical information needed to further identify these areas and map them. **Target Date for Completion**: 2015.

**Action**: Develop a cost-sharing program, which may supplement existing programs, for the implementation of agricultural conservation practices to protect these areas. **Status**: Implement, if needed.

**Action**: Review, participate, and apply MN DNR Shoreland Rules, including Minnesota Rules 6120.3300, Subp. 7, Agricultural Use Standards, where applicable and necessary. **Status**: Ongoing.

**Action**: Establish Water Management Districts or other funding alternatives to assist in financing water quality improvement projects or implementation plans resulting from the TMDL process. **Status**: Implement, as needed.

### 9.1.5 Wetland Goals

**Goal**: Manage the quantity and quality of wetlands within the watershed for their best function in a rapidly changing landscape.

**Policy WT-1**: Encourage the use of a functional assessment approach to define a wetlands best value allowing for multiple or singular use.

**Action**: Assist the local wetland LGUs in developing a weighting system reflective of importance, based on the values of the District, for the management of water. **Status**: Ongoing, as needed.

**Policy WT-2**: Maximize the preservation and restoration of wetlands providing critical flood control function.
**Action**: Identify those wetlands providing important peak flow reduction and needing preservation to maintain flood damage reduction function. **Target Date for Completion: 2015.**

**Policy WT-3**: Preserve high priority wetlands.

**Action**: Assist the LGU with identification of a Wetland Preservation Area within the SHRWD. **Target Date for Completion: 2015.**

**Action**: Identify, protect, and preserve high priority wetlands, as they pertain to the District’s water management goals. **Status: Ongoing.**

### 9.1.6 Natural Resources and Recreation Goals

**Goal**: Participate in the restoration, conservation, and protection of key areas providing unique ecological values and recreational opportunities.

**Policy NRR-1**: Adopt the natural resource enhancement goals established by the Flood Damage Reduction Mediation Agreement into District planning, programs and the development of projects.

**Policy NRR-2**: Promote and pursue land acquisition, easements, or other mechanisms to establish priority riparian corridors along waterways within the District.

**Action**: Define thresholds and boundaries for the District’s role in establishing priority riparian corridors. **Status: Ongoing.**

**Action**: Support county and state shoreland regulations that conserve existing shoreland resources. **Status: Ongoing.**

**Action**: Identify the priority riparian corridors. **Target Date for Completion: 2015.**

**Action**: Identify lands that would be included in the priority riparian corridors. **Target Date for Completion: 2015.**

**Action**: Require cooperation from all local, state, and federal agencies to establish priority riparian corridors. **Status: Ongoing.**

**Policy NRR-3**: Identify, restore, and protect key natural areas with multiple benefits, including groundwater recharge.
Action: Work with Resource agencies to protect and/or restore key natural areas, identified as priority areas within this plan. Status: Ongoing.

Action: Quantify and adopt goals for acres of grassland habitat by planning region, with input from local, state and federal agencies. Status: Completed in 2011 – See Table 5C.

Table 5C Existing Condition and Desired Future Condition for Cover – Planning Region 3

<table>
<thead>
<tr>
<th>Cover Type</th>
<th>Existing Condition (acres)</th>
<th>Existing Condition (percent)</th>
<th>Desired Future Condition (acres)</th>
<th>Desired Future Condition (percent)</th>
<th>Change (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultivated Land</td>
<td>22,319</td>
<td>50.39</td>
<td>22,569</td>
<td>50.94</td>
<td>250</td>
</tr>
<tr>
<td>Transitional Agricultural Land</td>
<td>1,480</td>
<td>3.34</td>
<td>825</td>
<td>1.86</td>
<td>-655</td>
</tr>
<tr>
<td>Wetlands, Lakes, and Rivers</td>
<td>11,445</td>
<td>25.83</td>
<td>11,645</td>
<td>26.29</td>
<td>200</td>
</tr>
<tr>
<td>Grasslands</td>
<td>1,569</td>
<td>3.54</td>
<td>1,669</td>
<td>3.77</td>
<td>100</td>
</tr>
<tr>
<td>Forest</td>
<td>5,148</td>
<td>11.62</td>
<td>5,248</td>
<td>11.85</td>
<td>100</td>
</tr>
<tr>
<td>Developed</td>
<td>2,340</td>
<td>5.28</td>
<td>2,345</td>
<td>5.29</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>44,301</td>
<td>100</td>
<td>44,301</td>
<td>100</td>
<td>0</td>
</tr>
</tbody>
</table>

Action: Define thresholds and boundaries for the District’s role in identifying, restoring, and protecting natural areas. Status: Ongoing.

Action: Identify the priority natural areas. Target Date for Completion: 2015.

Action: Identify lands that would be included in the priority natural areas. Target Date for Completion: 2015.

Action: Integrate key natural areas into local plans for recreation or habitat improvement. Status: Ongoing, as needed.

Action: Where possible, maintain wetland connections with adjacent undisturbed areas to promote connectivity and linear corridors. Status: Ongoing.
**Action:** Quantify a goal for acres of wetland restoration by planning region, with input from local, state and federal agencies. **Target Date for Completion:** 2015

**Action:** Establish a wetland bank(s) for the benefit of District residents. **Target Date for Completion:** 2020.

**Policy NRR-4:** Promote opportunities for recreational activities through District programs, activities, and projects.

**Action:** Provide support to Natural Resource Projects. **Status:** Ongoing.

**Action:** Support activities of others for establishment of canoe routes and fishing access. **Status:** Ongoing.

**Policy NRR-5:** Identify and restore river reaches where natural resource values can be enhanced.

**Action:** Identify restorable waterway reaches. **Target Date for Completion:** 2015.

**Action:** Work with resource agencies to develop restoration plans. **Status:** Ongoing, as needed.

**Action:** Remove obstructions and other barriers to fish migration with the cooperation and assistance of the USACE and the MnDNR. **Status:** Ongoing, as needed.

### 9.1.7 Groundwater Goals

**Goal:** Pursue a sustainable balance between surface water management, land use activities, and groundwater integrity.

**Policy GW-1:** Manage groundwater resources using a regional and local cooperative approach.

**Action:** Assess the extent that groundwater and surface water resources are connected within the SHRWD. **Status:** Ongoing, as needed.

**Action:** Generally protect groundwater recharge areas within the District. Map these areas. **Target Date for Completion:** 2012.
**Action**: Monitor groundwater quality and condition in cooperation with others for potential impacts from stormwater runoff, agricultural practices, and other land use activities. **Status**: Ongoing.

**Action**: Evaluate the need for a cooperative groundwater program to protect domestic and industrial water supplies. **Status**: Implement, as needed.

**Action**: Participate in wellhead protection efforts in the District. **Status**: Ongoing.

**Policy GW-2**: Increase awareness of groundwater resources that are used for domestic and industrial purposes. **Status**: Ongoing.

### 9.1.8 Erosion and Sediment Goals

**Goal**: Facilitate the use of erosion and sediment control practices to reduce the impacts to channel stability, water quality, and wetlands from sedimentation.

**Policy ESC-1**: Establish, develop, or endorse consistent methods, procedures, and criteria for erosion and sediment control.

**Action**: Establish a template for erosion and sediment control plans that assists cities with the NPDES permit process. **Target Date for Completion**: 2015.

**Action**: Use the criteria within the NPDES Construction General Permit as the minimum acceptable criteria when reviewing projects or for District-lead projects. **Status**: Ongoing, as needed.

**Action**: Establish sediment loads at key locations (i.e., regional assessment locations) within the District. **Status**: Anticipated to be developed through TMDL process – to be completed by 2015.

**Policy ESC-2**: Manage erosion and sediment delivery from agricultural lands in accordance with allowable levels.

**Action**: Coordinate and / or cost share with appropriate agencies to pursue positive conservation measures for lands under traditional agricultural practices. **Status**: Ongoing.

**Action**: Establish Water Management Districts or other funding alternatives to assist in financing Erosion Control and Erosion Reduction Projects. **Status**: Implement, as needed.
Action: Evaluate the sediment transport capability of natural channels and the delivery of sediment to these channels. **Status: Anticipated to be developed through TMDL process – to be completed by 2015.**

Action: Reasonably ensure the stability of natural waterways and drainage ways. **Status: Ongoing.**

Action: Develop sediment rating curves at key locations within the District. **Status: Anticipated to be developed through TMDL process – to be completed by 2015.**

Action: Install BMPs along waterways. **Status: Ongoing – Implement with SWCDs.**

Action: Implement agricultural and drainage BMP’s along all drainage systems and promote land use changes (e.g., side inlets, buffer and grassed waterways, residue management, no active farming in road right-of-ways, etc.). **Status: Ongoing, as needed.**

Action: Complete sediment modeling to understand the sources and sinks of sediment within the District. **Status: Anticipated to be developed through TMDL process – to be completed by 2015.**

Action: Use modeling to establish benchmark, or reference, conditions for sediment erosion and loads within the District. **Status: Anticipated to be developed through TMDL process – to be completed by 2015.**

Action: Use modeling to identify specific implementation activities to reduce sediment erosion and sediment loads to benchmark, or reference, conditions within the District. **Status: Anticipated to be developed through TMDL process – to be completed by 2015.**

**Policy ESC-3:** Estimate and quantify the effect of District led projects on sediment supplies within the District to analyze their effectiveness in meeting District-wide goals.

Action: Coordinate monitoring at RAL sites for tracking sediment load trends, along with other water resource parameters. **Status: Ongoing, as needed.**

### 9.1.9 Education Goals

**Goal:** Heighten the awareness of key constituencies within the District, sufficient to modify behavior to improve the recognition of Watershed Management through implementation of District policies, programs, and activities.
**Policy ED-1**: Use emerging technologies and tools to inform target audiences of District activities and programs.

**Action**: Maintain a web page that includes conveying educational materials. **Status**: Ongoing.

**Action**: Complete and implement a stakeholder involvement program. **Status**: Ongoing.

**Action**: Web-enable databases and information collected by the District. **Status**: Ongoing.

**Policy ED-2**: Maximize the use of shared education resources and joint participation in educational activities.

**Action**: Provide funding to the River Watch Program, or suitable entities, to develop and implement education programs and materials for improving water quality. **Status**: Ongoing.

**Action**: Pursue partnerships between public and private entities within the District, with an emphasis on schools, to implement educational programs and projects. **Status**: Ongoing.

**Policy ED-3**: Structure educational activities to mesh with defined target audiences.

**Action**: Organize education outreach opportunities for target audiences. **Status**: Ongoing.

**Policy ED-4**: Use existing facilities and natural resources to apply education programs.

**Action**: Elevate the public awareness of significant surface waters and their habitat values. **Status**: Ongoing.

**Action**: Identify high quality landscapes that may be used for education or interpretive activities. **Target Date for Completion**: 2015.

**Action**: Pursue educational opportunities at stormwater demonstration sites or notable low impact development facilities in the District. **Status**: Ongoing.

**Policy ED-5**: Serve as a management and technical resource for surface water drainage, tile drainage, wetland management, and shoreland management. **Status**: Ongoing, as needed.
9.1.10 Long Range Work Planning Goals

Goal: Utilize District funds to initiate or support long range work plan programs, projects, and activities to improve the resources of the District.

**Policy WP-1**: Proactively coordinate with cities, counties, SWCDs, and others to effectively synchronize long range work plan projects, thereby providing the best value to watershed constituents.

**Status**: Ongoing.

**Policy WP-2**: Maintain a flexible approach to long range work planning.

**Action**: Periodically review and adjust the District’s long range work plan as new information, circumstances, or resources arise. **Status**: Ongoing, as needed.

**Policy WP-3**: Use the Long Range Work Plan to integrate development of the annual work plan, the annual budget, and the annual report.

**Action**: Prioritize the items with the Long Range Work Plan. **Target**: Complete Annually.

**Action**: Annually review the priorities assigned to the action items within the Long Range Work Plan and reprioritize based upon the needs of the District. **Target**: Complete Annually.

**Action**: Use the planning level budget estimate for action items in the Long Range Work Plan to assist in development of the annual budget. **Target**: Complete Annually.

**Action**: Use the self-assessment procedure within the WMP to assess District progress for reporting in the Annual Work Plan. **Target**: Complete Annually.

**Action**: Report activities using the program established within this WMP. **Target**: Complete Annually.

**Policy WP-4**: Pursue cost-sharing and grant opportunities to help and assist in financial obligations for the local project and program costs, and to make these local projects possible.

9.1.11 Data Collection and Management Goals

Goal: Collect and manage data in a manner that maximizes the availability to and use by constituents of the District and enhances decision-making.
Policy DCM-1: Maintain data in an electronic, or other suitable format, enhancing the ease of distribution to others.


Action: Create an electronic bibliography of reports and other technical information pertinent to the District. Target Date for Completion: 2012. Update Annually.

Action: Serve as a source for FEMA boundary information and data. Target Date for Completion: 2012.

Policy DCM-2: Encourage the development of hydrologic, hydraulic, and water quality models within the District using consistent methods, input parameters, and procedures.

Action: Define hydrologic parameter development methods. Target Date for Completion: 2015.

Action: Collect data to characterize hydrology, waters, and regional assessment locations within the District. Status: Ongoing.

Policy DCM-3: Maintain the data collection program for District resources.

Action: Define goals, objectives, and protocols for the data collection program (Monitoring Program Plan/Manual). Target Date for Completion: 2015.

Action: Evaluate the data collection network and revise the program to fill gaps or streamline efforts. Status: Ongoing, as needed.

Action: Recognize the efforts of volunteers in collecting water quality data. Status: Ongoing.

Policy DCM-4: Maintain a repository of technical information related to hydrologic, hydraulic, and water quality modeling for District related activities.

Action: Provide standardized input data needed for hydrologic and hydraulic modeling to the cities and counties. Status: Ongoing, as needed.
**10. Long-Range Work Plan**

The SHRWD has established a long-range work plan for Planning Region 3 in order to provide a framework for solutions addressing problems and issues within the planning region. The long-range work plan will be developed and periodically updated as Exhibit A to this WMP.
11. Public Involvement Activities

11.1 Flood Damage Reduction Project Team

In 1997, the Legislature urged formation of the Red River Basin Flood Damage Reduction Work Group (RRBFRDWRG) to resolve gridlock over state/federal permitting of flood damage reduction projects in the Red River Valley. The resulting agreement was intended as the framework for a new, collaborative approach to implement both flood damage reduction and natural resource protection and enhancement in ways that benefit all Minnesota citizens. The keys to this new approach were presented as comprehensive watershed planning, clearly identified goals, early consultation and collaboration on flood damage reduction projects among stakeholders, and a cooperative approach to project permitting. The purpose of the Mediation Agreement is:

To reach consensus agreements on long term solutions for reducing flood damage and for protection and enhancement of natural resources. Such agreements should balance important economic, environmental, and social considerations, and must provide for fair and effective procedures to resolve future conflicts related to flood damage reduction.

Since 1998, the SHRWD Mediation PT has met on a regular basis. The result of their work has been several multipurpose projects, incorporating both flood damage reduction and natural resource enhancement.

Table 4C includes the issues and problems identified by the Project Team within Planning Region 3. The issues and problems are generally related to:

- Flood damage reduction along the lower reaches of the Sand Hill River;
- Flood damage reduction along the Red River;
- Maintenance of legal drainage systems;
- The ability of fish to pass over dams, drop structures and other barriers;
- The flooding of agricultural land; and
• Erosion of and sedimentation within stream channels.

A more detailed description of the issues and problems is presented within Section 8.1, Issues and Problems.

The Project Team has also developed, discussed and evaluated potential solutions for many of the problems identified. These potential solutions include:

• Constructing levees;
• Constructing gated retention storage projects on the Sand Hill River main stem;
  • Constructing gated retention storage projects on Sand Hill River tributaries;
• Completing diversions;
• Restoring wetlands;
• Completing drainage system maintenance;
• Modifying or removing dams;
• Installing buffers; and
• Stabilizing channels.

A more detailed description of the issues and problems is presented within Section 8.1.

11.2 Regional Planning Meetings

The public involvement process completed by the SHRWD included conducting meetings with key stakeholders within each of the planning regions. The purpose of the first meeting was to convey to the public the purpose of the plan update and to provide a formal opportunity to identify flood damage reduction and natural resource enhancement issues in the specific planning region. The purpose of the second meeting was to discuss the magnitude of the issue or problem and present and discuss potential solutions. The first meeting in Planning Region 3 was conducted on August 23, 2007, at the St. Mikes Park, on Union Lake. This meeting was held in conjunction with Planning Region 1. The meeting included a discussion of:

• An introduction to the planning process being conducted by the SHRWD;
• An overview of the hydrology of Planning Region 3;
• Staffs’ perspective on resource management issues and problems;
• Opportunities for enhancing natural resources; and a
• Small group discussion specific to identifying resource issues and problems.

Meeting minutes were used to summarize the results of the meeting. Issues and problems identified during the meeting were graphically recorded using a map. **Table 4C** includes the issues and problems identified during the Planning Region 3 meeting and the public’s comments.
Location Map

Figure 3C - Restorable Resources - Partially Drained Wetlands in Planning Region 3

Data source: MN DNR Data Deli. "Partially Drained" wetlands are those found in the National Wetlands Inventory (NWI) with a "d" special modifier which indicates the wetland has been partially drained or ditched.

Legend
- County Boundary
- Legal Boundary
- Cities
- Sections/Watershed
- Townships

Transportation
- US Highway
- State Highway
- County Highway
- County Road
- Legal Drainage Ditch
- Railroads

Water Features
- Centerline (River)
- Stream (Perennial)
- Drainage Ditch (Perennial)
- Stream (Intermittent)
- Drainage Ditch (Intermittent)
- Waterbody

Wetland (NWI)
- Partially Drained Wetland
- Wetland
Exhibit A
Long-Range Work Plan
Planning Region 3
Sand Hill River Watershed District

Purpose: The SHRWD has established a long-term work plan for each planning region in order to provide a framework for solutions addressing problems and issues within the planning region. The format follows that of the goals / policy / action items in Section 9 of the planning region appendix to the WMP. The long-range work plan will be developed and periodically updated.

Date Established: December 19, 2011

Last Updated: December 19, 2011 by Lawrence Woodbury

Key to Priority Ranking:

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>High to urgent level of priority, action by District likely to be imminent</td>
</tr>
<tr>
<td>M</td>
<td>Moderate level of priority, action by District in foreseeable future</td>
</tr>
<tr>
<td>L</td>
<td>Low level of priority, action by District may be more prudent at a future time</td>
</tr>
<tr>
<td>C</td>
<td>Action is substantially complete and thus holds minimal priority</td>
</tr>
<tr>
<td>IP</td>
<td>In progress</td>
</tr>
<tr>
<td>NA</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Floodplain Management Goals

Goal: Opportunistically manage floodplains for multiple, non-development use.

Policy FM-1: Maintain established (adopted) requirements for floodplain management (including floodplain alterations, development within floodplains, minimum building elevations) implemented through zoning and land use controls at the local level.

Action: Recommend development in floodplain areas meet the current flood proofing requirements.

Priority: L  Status: Ongoing  Implementation Dates: Begin - 2012  End - Indefinite

Implementation Tools: None  Dependency: Yes – County zoning, FEMA  Budget: $1000

General Comments:

Policy FM-2: Manage floodplains in a manner that reflects the rate and volume of runoff from ultimate development.

Action: Develop information about peak discharges and runoff volumes reflective of existing development using the District’s hydrologic model in support of those responsible for implementing the floodplain management program at the local level.

General Comments:

Action: Assist in the development of peak discharges and runoff volumes reflective of ultimate development in support of those responsible for implementing the floodplain management program at the local level.

Priority: L    Status: Ongoing    Implementation Dates: Begin – 2012    End - Indefinite

Policy FM-3: Incorporate appropriate opportunities for multiple floodplain uses (e.g., green space, recreation, and ecological enhancement) on District projects.

Action: Maintain the most recent FEMA floodplain boundaries on the District web site.


Policy FM-4: Educate public officials and the citizens of the SHRWD on the importance floodplain management and flood proofing measures.

Action: Provide information and guidance to public officials and citizens to ensure sound floodplain management.

Priority: M    Status: Ongoing    Implementation Dates: Begin - 2012    End - None

Policy FM-5: The District will assist in using the latest technology (i.e., LiDAR topography) in establishing floodplain delineations and elevations. Status: Ongoing.
Flood Damage Reduction Goals

Goal: Minimize existing and future potential damages to property, public safety, and water resources due to flood events in urban and agricultural areas.

Policy FDR-1: Attempt to maintain the post-development 2-year, 10-year and 100-year peak rate of runoff at or below the pre-development level for the critical duration precipitation event, both on-site and at key regional locations identified by the District and within incorporated cities.

Action: Develop a culvert inventory of culverts on all natural and artificial (including legal drainage ditches) for Planning Region 3. The inventory will include culvert/bridge standard sizes, dimensions and waterway areas, invert elevations (flow line elevations referenced to 1988 USGS Datum MSL). The District will finance this data collection effort with grants or other means.

Action: Use (at a minimum) the most downstream locations within the regional planning units as the key regional assessment (RAL) locations.

Action: Compensate impacted landowners for damage if peak reduction actions cannot be done (mitigation).

Action: Provide technical assistance to cities needing information about peak discharge and runoff volumes or other hydrology related information.

Implementation Tools: Models and LiDAR  
Implementation Dates: Begin - 2012  
End - None  
Budget: $1500

Implementation Tools: LiDAR mapping  
Implementation Dates: Begin - 2012  
End - 2012  
Budget: $10000

Implementation Tools: Hydrologic models  
Implementation Dates: Begin - 2011  
End - Indefinite  
Budget: $5000

General Comments: District is a partner in the RAL establishment financially and operationally with cooperating state agencies. Locations are determined, data gathering is yet to start.

General Comments: 

General Comments: 

General Comments:
**General Comments:**

**Action:** Encourage the improvement of natural channels and legal drainage systems in Planning Region 1 to enhance their capacity and efficiency to facilitate the planning region’s early discharge and timing to the Red River, ahead of major Red River peak flood flows.

**Priority:** H  
**Status:** Ongoing  
**Implementation Dates:** Begin - 1976  
**End:** Indefinite

**Implementation Tools:** modeling, LiDAR  
**Dependency:** No  
**Budget:** $2.4 million

**General Comments:** Current Project 24 – legal drainage improvements in the Neilsville area is under construction. Financing is by assessment based on benefits. Other projects are expected to occur in the future for maintenance, repair, improvement or establishment to legal drainage systems in Planning Region 1.

**Policy FDR-2:** Use consistent design standards, evaluation tools, and performance measures for managing urban storm water runoff.

**Action:** Size storm water conveyance and detention facilities in accordance with the need to protect infrastructure such as roads and utilities, and maximize safety.

**Priority:** M  
**Status:** Ongoing  
**Implementation Dates:** Begin - TBD  
**End:** Indefinite

**Implementation Tools:** Models, LiDAR  
**Dependency:** No  
**Budget:** TBD

**General Comments:** Most recent application of this policy was for the City of Fosston storm water management system for a new industrial development.

**Policy FDR-3:** Reduce the likelihood of exacerbating downstream flood damages by controlling, where feasible, the peak discharges and runoff volumes for areas subject to frequent flooding within the District.

**Action:** Map areas within the District subject to frequent flooding and identify the recurrence interval, duration and severity of flooding.

**Priority:** M  
**Status:** Ongoing  
**Implementation Dates:** Begin - 2012  
**End:** Indefinite

**Implementation Tools:** Modeling / LiDAR  
**Dependency:** No  
**Budget:** TBD

**General Comments:**

**Action:** Identify the hydrologic conditions (e.g., peak flow rates, sub watersheds contributing the greatest proportion of the peak discharge) for the areas mapped.

**Priority:** H  
**Status:** Ongoing  
**Implementation Dates:** Begin - 1974  
**End:** Indefinite

**Implementation Tools:** Hydrologic models  
**Dependency:** Yes – RRWMB, RRBC  
**Budget:** TBD

**General Comments:** RRWMB and RRBC cost-share in developing this information for both the District and the Red River Basin.
**Action:** Complete hydrologic and hydraulic modeling to assess the relationship between peak discharges, runoff volumes, and areas subject to flooding.

**Priority:** H  
**Status:** Complete  
**Implementation Dates:** Begin - 2006  
End - 2011  
**Implementation Tools:** Hydrologic model  
**Dependency:** Yes – BWSR, DNR  
**Budget:** $150,000

**General Comments:** This modeling was completed as part of the development of this WMP. Funding assistance was provided by BWSR grant. This model will continue to be used for future assessments.

**Action:** Establish desired future conditions for peak flows and runoff volumes, as goals for reducing the size of areas subject to flooding at RALs and additional locations as determined necessary in the future.

**Priority:** H  
**Status:** Completed  
**Implementation Dates:** Begin - 2006  
End - Indefinite  
**Implementation Tools:** Models  
**Dependency:** No  
**Budget:** $10000

**General Comments:** This was done to support this WMP. Results are documented in Tables 5.3 and 5.4

**Action:** Complete hydrologic and hydraulic modeling to assess flows at critical regional crossings and locations.

**Priority:** M  
**Status:** Ongoing  
**Implementation Dates:** Begin - 2008  
End - Indefinite  
**Implementation Tools:** Hydro models  
**Dependency:** No  
**Budget:** TBD

**General Comments:**

**Action:** Identify and preserve critical areas necessary for the temporary storage of runoff.

**Priority:** H  
**Status:** Ongoing  
**Implementation Dates:** Begin - 1998  
End - Indefinite  
**Implementation Tools:** Models & LiDAR  
**Dependency:** No  
**Budget:** TBD

**General Comments:**

**Action:** Identify and preserve critical areas necessary for the conveyance of storm water runoff.

**Priority:** L  
**Status:** Not started  
**Implementation Dates:** Begin - 2012  
End - Indefinite  
**Implementation Tools:** Hydraulic models  
**Dependency:** No  
**Budget:** TBD

**General Comments:**

**Policy FDR-4:** Protect waterways from channel instability induced by runoff, especially when used as an outlet for urban or agricultural drainage systems.

**Priority:** M  
**Status:** Not started  
**Implementation Dates:** Begin - TBD  
End - TBD  
**Implementation Tools:** TBD  
**Dependency:** No  
**Budget:** TBD

**General Comments:**
**Action:** Identify priority areas for protection and restoration of waterways within the District Planning Region 3. – (i.e., the Sand Hill River)

Priority: H       Status: Not started       Implementation Dates:   Begin - TBD       End - 2020


General Comment:

**Policy FDR-5:** Adopt the flood damage reduction goals established by the Flood Damage Reduction Mediation Agreement into District planning, programs and the development of projects.

Priority: H       Status: Completed       Implementation Dates:   Begin - 1998       End - Indefinite

Implementation Tools:       Dependency: Yes – COE, DNR, MPCA       Budget: $20000

General Comments: Actions are being accomplished through the FDR WG Project Team for the District.

**Policy FDR-6:** Plan, design, and construct projects for local flood damage reduction benefits, while considering and targeting an optimum portion of the Red River main stem contribution to flooding and flood damages from the District. (The Red River Basin Commission’s (RRBC) MIKE 11 model provides some indication of the Sand Hill River’s “fair share” portion of the Red River main stem contribution to flooding).

**Action:** Complete hydrologic modeling to establish target peak discharges for the contribution of the SHRWD to the Red River Main stem.

Priority: H       Status: Comp. in 2011       Implementation Dates:   Begin - NA       End - 2011

Implementation Tools: Hydro models       Dependency: RRBC, RRWMG       Budget: $50000

General Comments:

**Action:** Use the target peak discharges as an evaluation criteria when planning, developing, and designing projects and implementing programs.

Priority: H       Status: Not started       Implementation Dates:   Begin - 2012       End - Indefinite

Implementation Tools:       Dependency: Yes – FDR WG PT       Budget: $25000

General Comments:

**Action:** Use the technical tools developed by the RRWMB and IWI to evaluate the main stem value of flood damage reduction projects. **Status: Ongoing.**


Implementation Tools:       Dependency: Yes – RRWMB, BWSR       Budget: TBD
General Comments:

Policy FDR-7: Plan, design, and construct projects for a minimum 35% reduction in flood discharges during the 100-year flood event at the outlet of the Sand Hill River.

**Action:** Development of projects that contribute to runoff reduction goals at the Sand Hill River outlet is somewhat limited within Planning Region 3. However, smaller FDR projects with primarily local benefits are being pursued where feasible.

**Priority:** L  
**Status:** Ongoing  
**Implementation Dates:** Begin - 2000  
End - Indefinite  
**Implementation Tools:** SHRWD models  
**Dependency:** FDRWG PT  
**Budget:** TBD

General Comments:

**Action:** Complete hydrologic modeling to determine estimated project FDR benefits.

**Priority:** H  
**Status:** Not started  
**Implementation Dates:** Begin - TBD  
End - Indefinite  
**Implementation Tools:** SHRWD models  
**Dependency:** FDRWG PT  
**Budget:** TBD

General Comments:

**Action:** Monitor to determine whether FDR activities are having benefit of reducing peak discharges at RAL locations.

**Priority:** L  
**Status:** Not started  
**Implementation Dates:** Begin - TBD  
End - TBD  
**Implementation Tools:** TBD  
**Dependency:** No  
**Budget:** TBD

Legal Drainage System Goals

*Goal:* Manage legal drainage systems in accordance with MSA 103E, while recognizing the need for agricultural drainage and sensitivity to environmental concerns.
Policy LDS-1: Maintain or reduce the 2-year and the 10-year peak rates of runoff at the Regional Assessment locations in Planning Region 2, at pre-improvement levels for the critical duration precipitation events when improving and establishing legal drainage systems within Planning Region 2.

Priority: H  Status: Ongoing  Implementation Dates:  Begin - 2012  End - Indefinite
Implementation Tools:  Dependency: No  Budget: TBD

General Comments: There are few drainage systems within Planning Region 2. However, Polk CD 122 has received much attention in the last several years as a candidate for improvement.

Policy LDS-2: Use consistent technical standards, evaluation tools and performance measures for designing and evaluating the effects of agricultural drainage systems, including the adequacy of the outlet.

Action: Establish design standards for the repair, maintenance, improvement, and establishment of agricultural drainage systems within the District.

Priority: H  Status: Complete  Implementation Dates:  Begin - 1974  End - Indefinite
Implementation Tools: Hyd. models  Dependency: No  Budget: TBD

General Comments: This process is followed on all District drainage projects.

Action: Determine specific technical criteria to be used in quantifying the adequacy of an outlet when improving or designing public and private drainage systems.


General Comments: Develop a standard analytical technique for assessing outlet adequacy which is acceptable to DNR.

Action: Identify legal drainage systems not in compliance with buffer strip requirements and work toward moving these systems into compliance in accordance with M.S.A. 103E.021.

Implementation Tools:  Dependency: No  Budget: $2000

General Comments: District has made this assessment already on improvement and new construction projects.

Policy LDS-3: Ensure lands deriving benefit from legal drainage systems are included within the benefited area of the legal drainage system and are fairly assessed relative to all properties within the benefited area.

Action: Map legal drainage systems including their benefited areas.

Priority: H  Status: Completed  Implementation Dates:  Begin - 2000  End - Indefinite
Implementation Tools: LiDAR maps  Dependency: No  Budget: TBD

General Comments: This is a standard procedure on all District drainage projects and will continue as they occur.

Action: Periodically compare maps of the benefited areas for legal drainage systems and parcel data to the detailed hydrologic (drainage) boundaries maintained by the District.


Implementation Tools: LiDAR mapping  Dependency: No  Budget: TBD

General Comments: This is routine District procedure. Recent SHRWD boundary change reviewed all legal ditch assessment areas on District boundaries for compliance with hydrologic boundaries.

Action: Complete redetermination of benefits where needed in accordance with M.S.A. 103E.351.


Implementation Tools: LiDAR / ditch records  Dependency: Yes – County Comm.  Budget: TBD

General Comments: Requires consent of county commissioners when ditch system is originally under county jurisdiction.

Policy LDS-4: Pursue outside funding and modernize historic drainage system records in accordance with BWSR standards.

Action: Modernize drainage records to a digital format.

Priority: C  Status: Complete  Implementation Dates: Begin - 2009  End - Indefinite

Implementation Tools:  Dependency: Yes – BWSR  Budget: TBD

General Comments: New project records will automatically be in compliance with modernization standards.

Action: Pursue outside funding for drainage record modernization.

Priority: H  Status: Complete  Implementation Dates: Begin - 2009  End - 2010

Implementation Tools:  Dependency: Yes - BWSR  Budget: $30000

General Comments: District recently received a BWSR grant to assist in modernizing District drainage records.

Policy LDS-5: Complete inspections of existing legal ditch systems as necessary.

Action: Complete the annual buffer strip report as required by MSA 103E.067.

Priority: H  Status: Completed  Implementation Dates: Begin - Annually  End - Indefinite

Implementation Tools:  Dependency: No  Budget: $1000
General Comments: District does this annually on all systems.

Water Quality Goals

Goal: Maintain and, where practical, improve the water quality of rivers, stream, lakes, and groundwater resources within the District.

Policy WQ-1: Manage lake water quality expectations consistent with present and reasonably foreseeable landscape conditions.

Action: Establish programs and activities for addressing lake water quality issues within the District, complimentary and consistent with, but not duplicative of, existing programs, including, monitoring and use of MPCA’s Citizen Lake-Monitoring Program (see http://www.pca.state.mn.us/water/clmp.html).

Priority: L  Status: Ongoing  Implementation Dates:  Begin - 2012  End - Indefinite

Implementation Tools:  Dependency: Yes – MPCA, BWSR and DNR  Budget: TBD

General Comments: District is currently under contract with MPCA to do IWI and TMDL study.

Action: Use a classification method to identify “priority” lakes within the District as a method to focus the expenditure of District resources.


Implementation Tools:  Dependency: Yes - MPCA  Budget: TBD

General Comments: To be done in conjunction with current IWI and TMDL study.

Action: Utilize monitoring data to establish an attainable range for lake water quality in District lakes


Implementation Tools: IWI / TMDL  Dependency: Yes - MPCA  Budget: TBD

General Comments: To be determined through TMDL Study process.

Action: Establish numeric lake water quality goals and nutrient loading rates consistent with these goals.


Implementation Tools: TMDL Study  Dependency: Yes - MPCA  Budget: TBD

General Comments: To be determined through TMDL Study process.

Action: Prepare lake-specific management plans as a tool for managing lakes working with PCA, DNR, and local lake management organizations.

Priority: L  Status: As needed  Implementation Dates:  Begin - TBD  End - Indefinite
Policy WQ-2: Lead the development of portions or all of the TMDLs needed for waters listed as impaired within the SHRWD, provided the financial burden is fairly shared between the State of Minnesota and the District.

**Action:** Discuss options with the MPCA for leading TMDL efforts in the District.

**Priority:** IP  
**Status:** Ongoing  
**Implementation Dates:** Begin - 2011  
End - 2015

**Implementation Tools:** TMDL Study  
**Dependency:** Yes - MPCA  
**Budget:** TBD  

**General Comments:** To be determined through TMDL Study process

**Action:** Use resources to assist with and confirm listed waters within the SHRWD.

**Priority:** IP  
**Status:** Ongoing  
**Implementation Dates:** Begin - 2011  
End - 2015

**Implementation Tools:** TMDL Study  
**Dependency:** Yes - MPCA  
**Budget:** TBD  

**General Comments:** To be determined through TMDL Study process

**Action:** Develop a Water Quality Monitoring Program plan.  
**Status:** Ongoing.

**Priority:**  
**Status:**  
**Implementation Dates:** Begin -  
End -

**Implementation Tools:**  
**Dependency:**  
**Budget:**

**General Comments:**

**Action:** Evaluate MPCA priorities for TMDL completion to ensure consistency with District priorities and establish a mutually agreed upon priority list.

**Priority:** IP  
**Status:** Ongoing  
**Implementation Dates:** Begin - 2011  
End - 2015

**Implementation Tools:** TMDL Study  
**Dependency:** Yes - MPCA  
**Budget:** TBD  

**General Comments:** To be determined through TMDL Study process

**Action:** Determine financial considerations for TMDL completion.

**Priority:** IP  
**Status:** Ongoing  
**Implementation Dates:** Begin - 2011  
End - 2015

**Implementation Tools:** TMDL Study  
**Dependency:** Yes - MPCA  
**Budget:** TBD  

**General Comments:** To be determined through TMDL Study process

**Action:** Investigate the potential of having the MPCA add sites within the bounds of the District for monitoring long-term water quality trends (RALs).
Implementation Tools: TMDL / IWI Study  Dependency: Yes - MPCA  Budget: TBD

General Comments: To be determined through TMDL Study process

Policy WQ-3: Use design criteria and performance standards to ensure appropriate BMPs for mitigating land use impacts to surface and groundwater resources.

Action: Reduce erosion and sedimentation in water courses and wetlands.

Priority: IP  Status: Ongoing  Implementation Dates:  Begin - 2008  End - Indefinite
Implementation Tools: Dependency: Yes – County SWCDs  Budget: $50000

General Comments: Currently working in partnership with East Polk SWCD in securing Clean Water grant for Carlson site and Polk CD 122 projects.

Action: Reduce wind erosion.

Priority: L  Status: Ongoing  Implementation Dates:  Begin - 2012  End - Indefinite
Implementation Tools: Dependency: Yes – County SWCDs  Budget: TBD

General Comments:

Action: Establish additional measures necessary to protect unique or high quality water resources within the District.

Implementation Tools: TMDL Study  Dependency: Yes – MPCA, MN HD  Budget: TBD

General Comments: To be determined through TMDL Study process

Policy WQ-4: Use innovative methods and techniques to maintain and improve water quality when appropriate.

Action: Develop a cost-sharing program to encourage the use of innovative or demonstration technologies.

Implementation Tools: TMDL Study  Dependency: Yes - MPCA  Budget:

General Comments: To be determined partly through TMDL Study process

Action: Develop and implement water management districts as a finance mechanism for water quality programs.

Priority: L  Status: As needed  Implementation Dates:  Begin - TBD  End - Indefinite
Implementation Tools: Dependency: Yes – local desire  
Budget: TBD

General Comments: A WMD initiation process is in place to be used where necessary.

Action: Develop a water quality monitoring program cost sharing document to aid in improving consistency of monitoring efforts and target monitoring efforts towards generating data that will aid in investigating issues in the District.


Implementation Tools: TMDL & IWI Study  Dependency: Yes - MPCA  
Budget: TBD

General Comments: To be determined partly through TMDL Study process

Policy WQ-5: Recognize the inherent variability in water quality concentrations and loads when managing surface and groundwater resources.

Action: Use monitoring data to aid in establishing sub-watershed annual load values reflective of variability in climate and land use.


Implementation Tools: TMDL & IWI Study  Dependency: Yes - MPCA  
Budget: TBD

General Comments: To be determined partly through TMDL Study process

Policy WQ-6: Promote the use of BMPs in areas of agricultural land use, especially in those areas with sensitive ground water and surface water resources.

Action: Obtain the technical information needed to further identify these areas and map them.


Implementation Tools: TMDL Study  Dependency: Yes - MPCA  
Budget: TBD

General Comments: To be determined partly through TMDL Study process

Action: Develop a cost-sharing program, which may supplement existing programs, for the implementation of agricultural conservation practices to protect these areas.

Priority: L  Status: Not started  Implementation Dates: Begin – TBD  End - TBD

Implementation Tools: Dependency: Yes – County SWCDs & MPCA  
Budget: TBD

General Comments: Review, participate, and apply MN DNR Shoreland Rules, including Minnesota Rules 6120.3300, Subp. 7, Agricultural Use Standards, where applicable and necessary.
Priority: L  Status: Not started  Implementation Dates: Begin - TBD  End - Indefinite

Implementation Tools: Dependency: Yes - DNR  Budget: TBD

General Comments:

**Action**: Establish Water Management Districts or other funding alternatives to assist in financing water quality improvement projects or implementation plans resulting from the TMDL process.

Priority: L  Status: As needed  Implementation Dates: Begin - TBD  End - Indefinite

Implementation Tools: Dependency: Yes – local desire  Budget: TBD

General Comments:

### Wetland Goals

**Goal**: Manage the quantity and quality of wetlands within the watershed for their best function in a rapidly changing landscape.

**Policy WT-1**: Encourage the use of a functional assessment approach to define a wetlands best value allowing for multiple or singular use.

**Action**: Assist the local wetland LGUs in developing a weighting system reflective of importance, based on the values of the District, for the management of water.

Priority: L  Status: Not started  Implementation Dates: Begin - TBD  End - Indefinite

Implementation Tools: Dependency: Yes – BWSR, DNR, WCA  Budget: TBD

General Comments:

**Policy WT-2**: Maximize the preservation and restoration of wetlands providing critical flood control function.

**Action**: Identify those wetlands providing important peak flow reduction and needing preservation to maintain flood damage reduction function.


Implementation Tools: LiDAR & models  Dependency: Yes – DNR, SWCDs  Budget: TBD

General Comments:

**Policy WT-3**: Preserve high priority wetlands.

**Action**: Assist the LGU with identification of a Wetland Preservation Area within the SHRWD.

**Implementation Tools:** LiDAR  
**Dependency:** Yes – local LGU, DNR, USFWS  
**Budget:** TBD

**General Comments:** Local LGU will lead this effort.

**Action:** Identify, protect, and preserve high priority wetlands, as they pertain to the District’s water management goals.

**Priority:** M  
**Status:** Ongoing  
**Implementation Dates:**  
**Begin:** 2012  
**End:** Indefinite

**Implementation Tools:** LiDAR  
**Dependency:** Local LGU, DNR, USFWS  
**Budget:** TBD

**General Comments:** Local LGU will lead this effort.

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**Natural Resources and Recreation Goals**

*Goal: Participate in the restoration, conservation, and protection of key areas providing unique ecological values and recreational opportunities.*

**Policy NRR-1:** Adopt the natural resource enhancement goals established by the Flood Damage Reduction Mediation Agreement into District planning, programs and the development of projects.

**Priority:** H  
**Status:** In progress  
**Implementation Dates:**  
**Begin:** 1998  
**End:** Indefinite

**Implementation Tools:** NRE Assessment  
**Dependency:** Yes - RRWMB  
**Budget:** TBD

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**Policy NRR-2:** Promote and pursue land acquisition, easements, or other mechanisms to establish priority riparian corridors along waterways within the District.

**Action:** Define thresholds and boundaries for the District’s role in establishing priority riparian corridors.

**Priority:** L  
**Status:** Not started  
**Implementation Dates:**  
**Begin:** TBD  
**End:** Indefinite

**Implementation Tools:**  
**Dependency:** Yes - TBD  
**Budget:** TBD

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**Action:** Support county and state shoreland regulations that conserve existing shoreland resources.

**Priority:** M  
**Status:** In progress  
**Implementation Dates:**  
**Begin:** 1974  
**End:** Indefinite

**Implementation Tools:**  
**Dependency:** Yes – County Zoning authority  
**Budget:** TBD

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**General Comments:**
**Action:** Identify the priority riparian corridors.

**Priority:** L  
**Status:** Not started  
**Implementation Dates:** Begin - TBD  
**End - 2015**

**Implementation Tools:** NRE Assessment  
**Dependency:** Yes - DNR  
**Budget:** TBD

**General Comments:**

**Action:** Identify lands that would be included in the priority riparian corridors.

**Priority:** L  
**Status:** Not started  
**Implementation Dates:** Begin - TBD  
**End - 2015**

**Implementation Tools:** NRE Assessment  
**Dependency:** Yes – BWSR, DNR  
**Budget:** TBD

**General Comments:**

**Action:** Require cooperation from all local, state, and federal agencies to establish priority riparian corridors.

**Priority:** H  
**Status:** Not started  
**Implementation Dates:** Begin - TBD  
**End - Indefinite**

**Implementation Tools:**  
**Dependency:** Yes – local, state, federal  
**Budget:** TBD

**General Comments:**

Policy NRR-3: Identify, restore, and protect key natural areas with multiple benefits, including groundwater recharge.

**Action:** Work with Resource agencies to protect and/or restore key natural areas, identified as priority areas within this plan.

**Priority:** L  
**Status:** Not started  
**Implementation Dates:** Begin - TBD  
**End - Indefinite**

**Implementation Tools:** NRE Assessment  
**Dependency:** Yes – resource agencies  
**Budget:** TBD

**General Comments:**

**Action:** Quantify and adopt goals for acres of grassland habitat by planning region, with input from local, state and federal agencies.

**Priority:** C  
**Status:** Complete  
**Implementation Dates:** Begin - 2007  
**End - 2011**

**Implementation Tools:** WMP  
**Dependency:** Yes – BWSR  
**Budget:**

**General Comments:** See Table 5C in WMP

**Action:** Define thresholds and boundaries for the District’s role in identifying, restoring, and protecting natural areas.

**Priority:** M  
**Status:** Ongoing  
**Implementation Dates:** Begin - 2012  
**End - Indefinite**

**Implementation Tools:**  
**Dependency:** Yes – resource agencies  
**Budget:** TBD
General Comments:

**Action:** Identify the priority natural areas.

**Priority:** L  
**Status:** Not started  
**Implementation Dates:** Begin - 2012  
**End** - 2015

**Implementation Tools:** NRE Assessment  
**Dependency:** Yes – resource agencies  
**Budget:** TBD

General Comments:

**Action:** Identify lands that would be included in the priority natural areas.

**Priority:** L  
**Status:** Not started  
**Implementation Dates:** Begin - 2012  
**End** - 2015

**Implementation Tools:** NRE Assessment  
**Dependency:** Yes – resource agencies  
**Budget:** TBD

General Comments:

**Action:** Integrate key natural areas into local plans for recreation or habitat improvement.

**Priority:** L  
**Status:** Not started  
**Implementation Dates:** Begin - 2012  
**End** - Indefinite

**Implementation Tools:**  
**Dependency:** Yes – resources agencies  
**Budget:** TBD

General Comments:

**Action:** Where possible, maintain wetland connections with adjacent undisturbed areas to promote connectivity and linear corridors.

**Priority:** M  
**Status:** Not started  
**Implementation Dates:** Begin - 2012  
**End** - Indefinite

**Implementation Tools:**  
**Dependency:** Yes - resource agencies  
**Budget:** TBD

General Comments:

**Action:** Quantify a goal for acres of wetland restoration by planning region in Planning Region 3, with input from local, state and federal agencies.

**Priority:** C  
**Status:** Completed  
**Implementation Dates:** Begin - 2009  
**End** - 2011

**Implementation Tools:** WMP  
**Dependency:** Yes – resource agencies  
**Budget:** TBD

General Comments: Preliminary assessment completed in 2011 – see Table 5C in the WMP.

**Action:** Establish a wetland bank(s) for the benefit of District residents.

**Priority:** M  
**Status:** Not started  
**Implementation Dates:** Begin - TBD  
**End** - 2020

**Implementation Tools:**  
**Dependency:** No  
**Budget:** TBD

General Comments:
Policy NRR-4: Promote opportunities for recreational activities through District programs, activities, and projects.

**Action**: Provide support to Natural Resource Projects.


Implementation Tools:  Dependency: No  Budget: None

General Comments:

**Action**: Support activities of others for establishment of canoe routes and fishing access.

Priority: L  Status: Not started  Implementation Dates: Begin - TBD  End - TBD

Implementation Tools:  Dependency: No  Budget: TBD

General Comments:

Policy NRR-5: Identify and restore river reaches where natural resource values can be enhanced.

**Action**: Identify restorable waterway reaches.


Implementation Tools:  Dependency: Yes – resource agencies  Budget: TBD

General Comments:

**Action**: Work with resource agencies to develop restoration plans.


Implementation Tools:  Dependency: Yes - DNR  Budget: $8000

General Comments: The first project of this nature was competed this year at upper end of Sand Hill Ditch. Other projects will follow as needed.

**Action**: Remove obstructions and other barriers to fish migration with the cooperation and assistance of the USACE and the MnDNR.


Implementation Tools:  Dependency: Yes - DNR  Budget: $200000

General Comments: Completed in 2008 with the removal of one barrier in Planning Region 2 at the old West Mill Dam on the west side of Fertile. This was a township road box culvert with a 6 foot drop.

**Action**: Implement the SHRWD Fish Passage Master Plan.


Implementation Tools:  Dependency: Yes - DNR  Budget: $50000
**General Comments**: Modify four existing concrete drop structures for fish passage along the Sand Hill Ditch.

Implementation Tools:  Dependency: Yes - USACOE  Budget: $3000000

**General Comments**: Awaiting USACOE evaluation and funding.

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**Groundwater Goals**

*Goal: Pursue a sustainable balance between surface water management, land use activities, and groundwater integrity.*

**Policy GW-1**: Manage groundwater resources using a regional and local cooperative approach.

*Action*: Assess the extent that groundwater and surface water resources are connected within the SHRWD.

Priority: L  Status: Not started  Implementation Dates: Begin - TBD  End - TBD

Implementation Tools:  Dependency: Yes - DNR  Budget: TBD

**General Comments:**

*Action*: Generally protect groundwater recharge areas within the District. Map these areas.

Priority: L  Status: Not started  Implementation Dates: Begin - 2015  End - Indefinite

Implementation Tools:  Dependency: Yes – DNR?  Budget: TBD

**General Comments**: This needs to be done under the leadership of the state.

*Action*: Monitor groundwater quality and condition in cooperation with others for potential impacts from stormwater runoff, agricultural practices, and other land use activities.

Priority: L  Status: Not started  Implementation Dates: Begin - TBD  End - Indefinite

Implementation Tools:  Dependency: Yes – DNR and others?  Budget: TBD

**General Comments:**

*Action*: Evaluate the need for a cooperative groundwater program to protect domestic and industrial water supplies.

Priority: L  Status: Not started  Implementation Dates: Begin - TBD  End - TBD

Implementation Tools:  Dependency: Yes – DNR and others?  Budget: TBD

**General Comments:**
**Action**: Participate in wellhead protection efforts in the District.

**Priority**: L  
**Status**: Not started  
**Implementation Dates**: Begin - TBD  
**End**: Indefinite

**Implementation Tools**:  
**Dependency**: Yes – DNR, MDA, others?  
**Budget**: TBD

**General Comments**: None.

**Policy GW-2**: Increase awareness of groundwater resources that are used for domestic and industrial purposes.

**Priority**: M  
**Status**: Not started  
**Implementation Dates**: Begin - TBD  
**End**: TBD

**Implementation Tools**:  
**Dependency**: Yes – DNR, MDA, others?  
**Budget**: TBD

**General Comments**: None.

**Erosion and Sediment Goals**

**Goal**: Facilitate the use of erosion and sediment control practices to reduce the impacts to channel stability, water quality, and wetlands from sedimentation.

**Policy ESC-1**: Establish, develop, or endorse consistent methods, procedures, and criteria for erosion and sediment control.

**Action**: Establish a template for erosion and sediment control plans that assists cities with the NPDES permit process.

**Priority**: L  
**Status**: Not started  
**Implementation Dates**: Begin - 2013  
**End**: 2015

**Implementation Tools**:  
**Dependency**: Yes – BWSR, SWCDs  
**Budget**: $2000

**General Comments**: None.

**Action**: Use the criteria within the NPDES Construction General Permit as the minimum acceptable criteria when reviewing projects or for District-lead projects.

**Priority**: M  
**Status**: In progress  
**Implementation Dates**: Begin - 2000  
**End**: Indefinite

**Implementation Tools**:  
**Dependency**: No  
**Budget**: NA

**General Comments**: None.

**Action**: Establish sediment loads at key locations (i.e., regional assessment locations) within the District.

**Priority**: IP  
**Status**: In process  
**Implementation Dates**: Begin - 2011  
**End**: 2015

**Implementation Tools**: TMDL Study  
**Dependency**: Yes - MPCA  
**Budget**: NA
General Comments: Anticipated to be developed through TMDL process

Policy ESC-2: Manage erosion and sediment delivery from agricultural lands in accordance with allowable levels.

Action: Coordinate and / or cost share with appropriate agencies to pursue positive conservation measures for lands under traditional agricultural practices.

Priority: L Status: Not started Implementation Dates: Begin - TBD End - TBD
Implementation Tools: Dependency: Yes – BWSR, SWCDs Budget: TBD

General Comments:

Action: Establish Water Management Districts or other funding alternatives to assist in financing Erosion Control and Erosion Reduction Projects.

Priority: L Status: Not started Implementation Dates: Begin - TBD End - Indefinite
Implementation Tools: WMP Dependency: Yes – local support Budget: TBD

General Comments:

Action: Evaluate the sediment transport capability of natural channels and the delivery of sediment to these channels.

Implementation Tools: TMDL Study Dependency: Yes - MPCA Budget: NA

General Comments: Anticipated to be developed through TMDL process.

Action: Reasonably ensure the stability of natural waterways and drainage ways.

Implementation Tools: Dependency: Yes - ?? Budget: TBD

General Comments:

Action: Develop sediment rating curves at key locations within the District.

Implementation Tools: Dependency: Budget:

General Comments:

Action: Install BMPs along waterways.

Priority: Status: Implementation Dates: Begin - End -
Implementation Tools: TMDL Study Dependency: Yes - MPCA Budget: NA
**General Comments:** Anticipated to be developed through TMDL process.

**Action:** Implement agricultural and drainage BMP's along all drainage systems and promote land use changes (e.g., side inlets, buffer and grassed waterways, residue management, no active farming in road right-of-ways, etc.).

Priority: L  Status: Ongoing  Implementation Dates: Begin - 2012  End - Indefinite

**Implementation Tools:**  Dependency: Yes – Counties, SWCD  Budget: TBD

**General Comments:** Being done on District projects as matter of policy.

**Action:** Complete sediment modeling to understand the sources and sinks of sediment within the District.


**Implementation Tools:** TMDL Study  Dependency: Yes - MPCA  Budget: NA

**General Comments:** Anticipated to be developed through TMDL process.

**Action:** Use modeling to establish benchmark, or reference, conditions for sediment erosion and loads within the District.


**Implementation Tools:** TMDL Study  Dependency: Yes - MPCA  Budget: NA

**General Comments:** Anticipated to be developed through TMDL process.

**Action:** Use modeling to identify specific implementation activities to reduce sediment erosion and sediment loads to benchmark, or reference, conditions within the District.


**Implementation Tools:** TMDL Study  Dependency: Yes - MPCA  Budget: NA

**General Comments:** Anticipated to be developed through TMDL process.

**Policy ESC-3:** Estimate and quantify the effect of District led projects on sediment supplies within the District to analyze their effectiveness in meeting District-wide goals.

**Action:** Coordinate monitoring at RAL sites for tracking sediment load trends, along with other water resource parameters.


**Implementation Tools:** TMDL Study  Dependency: Yes - MPCA  Budget: NA

**General Comments:** Anticipated to be developed through TMDL process.
Education Goals

Goal: Heighten the awareness of key constituencies within the District, sufficient to modify behavior to improve the recognition of Watershed Management through implementation of District policies, programs, and activities.

Policy ED-1: Use emerging technologies and tools to inform target audiences of District activities and programs.

Action: Maintain a web page that includes conveying educational materials.

Priority: C  Status: Ongoing  Implementation Dates:  Begin - 2008  End - Indefinite
Implementation Tools: Web site  Dependency: No  Budget: $1000

General Comments:

Action: Complete and implement a stakeholder involvement program.

Priority: H  Status: Ongoing  Implementation Dates:  Begin - 2011  End - Indefinite
Implementation Tools: Web  Dependency: Yes - stakeholders  Budget: $1000

General Comments:

Action: Web-enable databases and information collected by the District.

Priority: H  Status: Ongoing  Implementation Dates:  Begin - 2008  End - indefinite
Implementation Tools: Web  Dependency: No  Budget: $1500

General Comments:

Policy ED-2: Maximize the use of shared education resources and joint participation in educational activities.

Action: Provide funding to the River Watch Program, or suitable entities, to develop and implement education programs and materials for improving water quality.

Implementation Tools:  Dependency: Yes – River Watch  Budget: $5000

General Comments:

Action: Pursue partnerships between public and private entities within the District, with an emphasis on schools, to implement educational programs and projects.

Implementation Tools: Web  Dependency: Yes - stakeholders  Budget: $1000

General Comments:
Policy ED-3: Structure educational activities to mesh with defined target audiences.

**Action**: Organize education outreach opportunities for target audiences.

- **Priority**: M  
- **Status**: Ongoing  
- **Implementation Dates**: Begin - 2012  
- **End**: Indefinite  
- **Implementation Tools**: Web  
- **Dependency**: Yes – target audiences  
- **Budget**: $1000

**General Comments:**

Policy ED-4: Use existing facilities and natural resources to apply education programs.

**Action**: Elevate the public awareness of significant surface waters and their habitat values.

- **Priority**: IP  
- **Status**: Ongoing  
- **Implementation Dates**: Begin - 1974  
- **End**: Indefinite  
- **Implementation Tools**: Web, County Fair  
- **Dependency**: No  
- **Budget**: $1000

**General Comments:**

**Action**: Identify high quality landscapes that may be used for education or interpretive activities.

- **Priority**: L  
- **Status**: Not started  
- **Implementation Dates**: Begin - 2012  
- **End**: 2015  
- **Implementation Tools**:  
- **Dependency**: No  
- **Budget**: $1000

**General Comments:**

**Action**: Pursue educational opportunities at storm water demonstration sites or notable low impact development facilities in the District.

- **Priority**: L  
- **Status**: Not started  
- **Implementation Dates**: Begin - TBD  
- **End**: TBD  
- **Implementation Tools**:  
- **Dependency**: No  
- **Budget**: $1000

**General Comments:**

Policy ED-5: Serve as a management and technical resource for surface water drainage, tile drainage, wetland management, and shoreland management.

- **Priority**: M  
- **Status**: Ongoing  
- **Implementation Dates**: Begin - 1974  
- **End**: Indefinite  
- **Implementation Tools**:  
- **Dependency**: No  
- **Budget**: TBD

**General Comments:**

**Long Range Work Planning Goals**
Goal: Utilize District funds to initiate or support long range work plan programs, projects, and activities to improve the resources of the District.

Policy WP-1: Proactively coordinate with cities, counties, SWCDs, and others to effectively synchronize long range work plan projects, thereby providing the best value to watershed constituents.

Implementation Tools: Dependency: No Budget: NA

General Comments:

Policy WP-2: Maintain a flexible approach to long range work planning.

Action: Periodically review and adjust the District’s long range work plan as new information, circumstances, or resources arise.

Priority: H Status: Ongoing Implementation Dates: Begin - 2011 End - Indefinite
Implementation Tools: WMP Dependency: Yes – Advisory Committee Budget: NA

General Comments:

Policy WP-3: Use the Long Range Work Plan to integrate development of the annual work plan, the annual budget, and the annual report.

Action: Prioritize the items with the Long Range Work Plan.

Priority: H Status: Ongoing Implementation Dates: Begin - 2011 End - Indefinite
Implementation Tools: WMP Dependency: No Budget: $1000

General Comments: Complete on an annual basis in December.

Action: Annually review the priorities assigned to the action items within the Long Range Work Plan and reprioritize based upon the needs of the District.

Priority: H Status: Ongoing Implementation Dates: Begin - 2011 End - Indefinite
Implementation Tools: WMP Dependency: No Budget: $1000

General Comments: Complete annually in December.

Action: Use the planning level budget estimate for action items in the Long Range Work Plan to assist in development of the annual budget.

Priority: H Status: Ongoing Implementation Dates: Begin - 2011 End - Indefinite
Implementation Tools: WMP  
Dependency: No  
Budget: NA

General Comments: Complete annually in December.

**Action**: Use the self-assessment procedure within the WMP to assess District progress for reporting in the Annual Work Plan.

**Priority**: H  
**Status**: Ongoing  
**Implementation Dates**: Begin - 2011  
**End**: Indefinite

Implementation Tools: WMP  
Dependency: No  
Budget: NA

General Comments: Complete annually in December.

**Action**: Report activities using the program established within this WMP.

**Priority**: H  
**Status**: Ongoing  
**Implementation Dates**: Begin - 2011  
**End**: Indefinite

Implementation Tools: WMP  
Dependency: No  
Budget: NA

General Comments: Complete annually in December as part of normal annual report requirement in statute.

**Policy WP- 4**: Pursue cost-sharing and grant opportunities to help and assist in financial obligations for the local project and program costs, and to make these local projects possible.

**Priority**: H  
**Status**: Ongoing  
**Implementation Dates**: Begin - 2011  
**End**: Indefinite

Implementation Tools:  
Dependency: No  
Budget: NA

General Comments:

**Data Collection and Management Goals**

*Goal:* Collect and manage data in a manner that maximizes the availability to and use by constituents of the District and enhances decision-making.

**Policy DCM-1**: Maintain data in an electronic, or other suitable format, enhancing the ease of distribution to others.

**Action**: Post data in electronic format for downloading on the District’s web page.

**Priority**: M  
**Status**: Ongoing  
**Implementation Dates**: Begin - 2000  
**End**: Indefinite

Implementation Tools: District computer  
Dependency: No  
Budget: $2000

General Comments:

**Action**: Create an electronic bibliography of reports and other technical information pertinent to the District.
Priority: L  Status: Ongoing  Implementation Dates: Begin - 2012  End - indefinite

Implementation Tools: District computer  Dependency: No  Budget: $1000

General Comments:

Action: Serve as a source for FEMA boundary information and data.


Implementation Tools:  Dependency: Yes – County Zoning, FEMA  Budget: $1000

General Comments:

Policy DCM-2: Encourage the development of hydrologic, hydraulic, and water quality models within the District using consistent methods, input parameters, and procedures.

Action: Define hydrologic parameter development methods.


Implementation Tools: Hydro models  Dependency: No  Budget: NA

General Comments:

Action: Collect data to characterize hydrology, waters, and regional assessment locations within the District.

Policy DCM-3: Maintain the data collection program for District resources.

Action: Define goals, objectives, and protocols for the data collection program (Monitoring Program Plan/Manual).


General Comments:

Action: Evaluate the data collection network and revise the program to fill gaps or streamline efforts.

Priority: L  Status: Not started  Implementation Dates: Begin - 2015  End - Indefinite

Implementation Tools:  Dependency: No  Budget: $500

General Comments:

Action: Recognize the efforts of volunteers in collecting water quality data.
Policy DCM-4: Maintain a repository of technical information related to hydrologic, hydraulic, and water quality modeling for District related activities.

**Action**: Provide standardized input data needed for hydrologic and hydraulic modeling to the cities and counties.

**Priority**: L  
**Status**: Not started  
**Implementation Dates**: Begin - 2012  
**End** - Indefinite

**Implementation Tools**: Web  
**Dependency**: No  
**Budget**: $2000

**General Comments**: Use the District web page to disseminate technical information to others, including: gaged flow rates, stages, runoff volumes, sub watershed boundaries, and other information useful in completing technical analyses.

**Action**: Use the District web page to disseminate information to others.

**Priority**: M  
**Status**: Not started  
**Implementation Dates**: Begin - 2012  
**End** - Indefinite

**Implementation Tools**: Web  
**Dependency**: No  
**Budget**: $1000

**General Comments**: Use the District web page to disseminate information to others.

**Action**: Maintain good drainage system records, including benefited areas.

**Priority**: H  
**Status**: Ongoing  
**Implementation Dates**: Begin - 1997  
**End** - Indefinite

**Implementation Tools**: District computer  
**Dependency**: No  
**Budget**: $1500

**General Comments**: District is constantly improving its record system.

**Action**: Modernize historic drainage system records to a digital format in accordance with BWSR standards.

**Priority**: H  
**Status**: Ongoing  
**Implementation Dates**: Begin - 2006  
**End** - Indefinite

**Implementation Tools**: District computer  
**Dependency**: No  
**Budget**: $1000

**General Comments**: District recently executed a grant from BWSR to modernize its drainage records.

**Action**: Pursue outside funding for drainage record modernization.
Priority: H  Status: Ongoing

Implementation Dates:  Begin - TBD  End - Indefinite

Implementation Tools:  Dependency: Yes - BWSR

Budget: $30000

General Comments: