

## 2 ISSUES AND PROBLEMS ASSESSMENTS

### 2.1 INTRODUCTION

~~In workshops and meetings with the Managers, the Technical Advisory Committee (TAC), the Citizen Advisory Committee (CAC), and staff, and through a critical review of the Second Generation Plan implementation, the District identified barriers blocking its ability to manage and protect the Minnesota River, lakes, streams, groundwater, and unique natural resources within the District. These barriers make it difficult for the District to effectively manage and protect resources:~~ The District completed a critical review of the 1999 Implementation Plan with the Technical Advisory Committee (TAC), the Citizen Advisory Committee (CAC), the Managers, and staff. In this review, the District identified barriers blocking its ability to manage and protect the Minnesota River, lakes, streams, groundwater, and unique natural resources. The following barriers make it difficult for the District to effectively manage and protect resources:

- Unclear role of the District
- Incomplete understanding of the function and value of some of the resources within the District
- Competition for limited fiscal resources
- Inability to control activities that originate outside District boundaries but affect District resources
- Development and population pressures
- Partial understanding of constantly changing rules and requirements of other regulatory entities (cities, federal and state agencies, and non-governmental organizations)
- Unfavorable perception of the Minnesota River
- Limited state control of non-point source pollution
- Increasing demand for recreational opportunities and open space
- Increased runoff volumes and peak discharges
- Limited public participation

~~By themselves, or in conjunction with others, these barriers exacerbate District water quality and resource protection issues.~~ These barriers exacerbate District water quality and resource protection issues. The following sections present the issues which directly or indirectly result from these barriers, assess existing programs and their adequacy to address the highlighted issues, and identify management gaps.

Management policies, goals, and strategies addressing the issues and gaps presented in this Section are presented later in this Plan.

### 2.2 ISSUES SUMMARY

The following issues were identified through the planning process:

1. Unclear Role of the District

2. Outside Influences
3. Water Quality
4. Flooding and Floodplain Management
5. Erosion and Sediment Control
6. Groundwater
7. Commercial and Recreational Navigation
8. Public Education and Outreach
9. Potential Problems

### **2.2.1 Issue 1 – Unclear Role of the District**

The District's role changed notably during the 39-year period from its formation in 1960 through 1999. The District's focus transitioned from its founding goal of assisting the COE in improving navigation of the Minnesota River channel, to one that includes the protection, preservation, surface maintenance, groundwater, and unique natural resources. This change reflects a shift in the value of resource protection and the expectations of watershed districts. With the introduction of new technology and improved methods to manage and protect resources (such as adaptive management, sustainability approach, etc.), the District is expected to change again. The District's challenge is defining a clear role that will enable them to easily adjust to changes.

This shift was identified by the TAC during the 2011 planning process, and it was determined that the managers needed to focus their attention on re-affirming the District's role. The issue involves a disconnection between how the Managers and stakeholders viewed their roles in the District. In order to successfully implement the goals and strategies of this Plan, it is important for all parties to be on the same page. Therefore, Goal 1 – Organizations Management, described below, was included in this Plan.

### **2.2.2 Issue 2 – Outside Influences**

The District encompasses the bottom 80 square miles of the 16,900-square-mile Minnesota River Basin (Figure 2-1). Major land use in the basin is agricultural in the upstream reaches and urban in the lower reaches. The District is the last subwatershed before the Minnesota River discharges into the Mississippi River. The District's geographical position makes it susceptible to outside influences. The reach of the Minnesota River and a few other tributaries (Bluff Creek, Riley Creek, Credit River, and others) would continue to be impaired even if the District's discharge of point and non-point sources were reduced to zero. This perplexing issue reflects the complexities of protecting resources that are heavily influenced by factors outside the District's control.

Figure 2-1: Minnesota River Basin Map



## 2.2.3 Issue 3 – Water Quality

### 2.2.3.1 Non-point sources

Non-point source pollution causes major violations to water quality standards for the lower Minnesota River. This is pollution that cannot be traced to a single source, as with point source pollution. Instead, pollutants are carried from the land and the atmosphere through runoff water such as stormwater or snowmelt, in seepage through the soil (augmented by tiling), and through atmospheric deposition. Non-point source pollutants include:

- Excess fertilizers, herbicides, and insecticides from agricultural lands and residential areas
- Oil, grease, and toxic chemicals from urban runoff and energy production
- Sediment from improperly managed construction sites, crop and forest lands, and eroding streambanks
- Salt leached from the soil by irrigation practices, and from road and parking lot application
- Bacteria and nutrients from waterfowl, livestock, pet wastes, and faulty septic systems
- Hydrologic modifications <sup>1</sup>
- Atmospheric deposition

---

<sup>1</sup> Changes in the volume, speed, or timing of high and low flows in a water body, generally a stream or river. A major cause in the Minnesota River watershed is the intense agricultural land use in the watershed and development, which changes vegetation and covers land with roofs, sidewalks, streets, and parking lots. Rainwater, unable to soak into soil, rushes with flash-flood-like intensity to streams. (<http://bluegreenbldg.org/technical-terms/>)

Both natural and human-caused sources of non-point pollution are closely related to land use and associated land management practices. As was previously mentioned, the land use in the upper watershed of the Minnesota River Basin is predominately agricultural, with the lower 80 or more square miles being largely urban. These lands outside the District boundaries contribute to the majority of total suspended solids (TSS) and total phosphorus (TP) to the District's water resources, as illustrated in Figure 2-2 and Figure 2-3 (University of Minnesota Extension 2002). The quantities of TSS and TP that end up in the lower Minnesota River cause adverse effects on the river's quality, health, and surrounding resources, such as floodplain lakes and streams.

In urban sectors, vegetated pervious surfaces are being converted to impervious surfaces such as roads, roofs, and parking lots, thereby increasing runoff rates. Potential problems documented in the 1999 Plan from stormwater runoff impacts on water quality, and on fish and wildlife resources include:

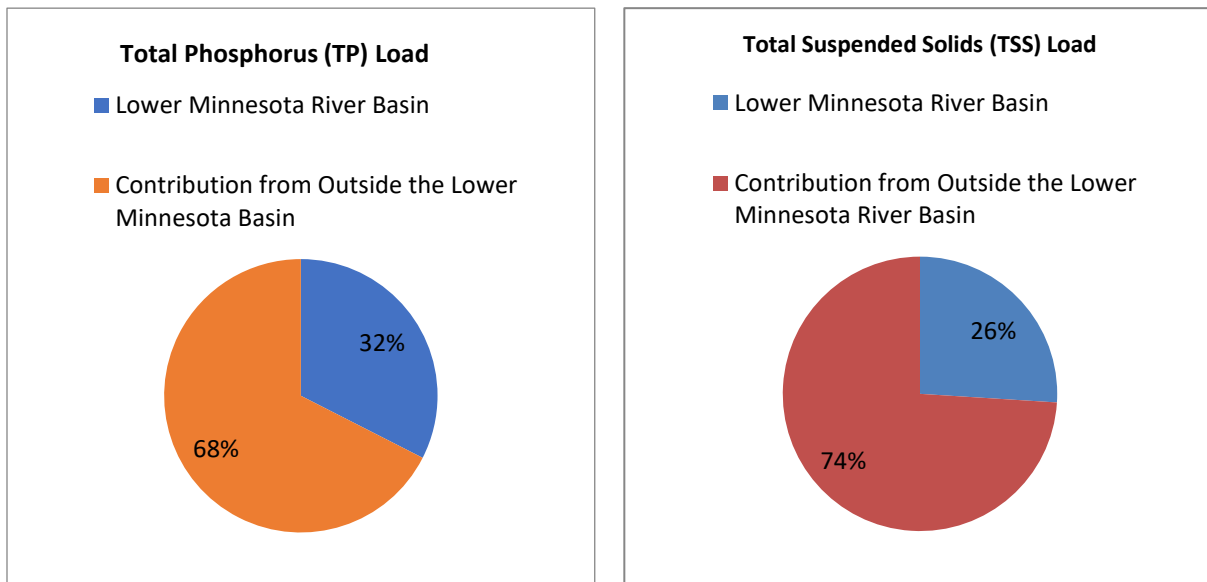
- Toxic levels of pollutants resulting in death or impairment of aquatic life
- Reductions in water clarity and quality (including warm water temperatures) resulting in a shift to more pollution tolerant aquatic species
- Wildlife injury or death resulting from ingestion of, or entanglement with, trash and debris
- Negative impacts on wildlife habitat from nutrients, oxygen-poor water, and sediment

It is difficult to identify and quantify sources of non-point pollution affecting water resources while considering the diverse nature of the problem. The District faces challenges such as raising the awareness of land management practices outside their jurisdiction, and regulating development and re-development activities within the District to reduce non-point source pollution.

Figure 2-2: Comparison of Loads from the Minnesota River Basin.



Figure 2-3: Load Comparison from the Lower Minnesota River Basin and External Contributors



### **2.2.3.2 Point Source Pollution**

Point source pollutants, unlike non-point sources, discharge to a receiving surface water at a specific point from an identifiable source. Within the District, these sources include, but are not limited to, the Blue Lake and Seneca wastewater treatment plants, commercial dischargers like Gedney Pickle Factory and Rahr Malting, and other sites as identified in Section 1. Within the Minnesota River Basin, outside of the District's authority, there are also point discharges that affect water quality. These include commercial and municipal facilities and discharge from subsurface sewage treatment systems (SSTS) formally known as individual sewage treatment systems (ISTS).

Point source pollution is often known and regulated by MPCA through the National Pollutant Discharge Elimination Systems (NPDES) program. However, smaller point source discharges such as those from SSTS can go unregulated. When left untreated or partially treated, point source pollution may contain small amounts of radiation or toxics that increase water temperature. As a result, aquatic wildlife and habitat are affected, as well as potentially lowering the amount of dissolved oxygen in the receiving water. These pollutants can be hazardous to both humans and other forms of life.

According to the District Dissolved Oxygen Total Maximum Daily Load (TMDL) (Gunderson & Klag 2004), prepared by MPCA in 2004, there are an estimated 155,000 septic systems located wholly or partly in the Minnesota River Basin. Of those, nearly 20,000 are categorized as having the potential to cause imminent threat to public health and safety (ITPHS). SSTS that could cause ITPHS represent improperly treated discharges from noncompliant SSTS flowing to surface water.

### **2.2.3.3 Specific Water Quality Problems**

This section discusses specific water quality problems and issues to be addressed in the District, grouped according to the type of water resource. Water resources discussed include: the Minnesota River, trout lakes/streams, tributary streams, lakes, fens, and wetlands.

#### *2.2.3.3.1 Minnesota River*

As documented, the Minnesota River water quality is impaired for aquatic life, recreation, and consumption because of intolerable levels of fecal coliform, mercury, dissolved oxygen, and turbidity. The 1999 Plan noted that the historically severe water quality problems in the Minnesota River are due to the fine-grained soils in the watershed and the large amount of agricultural activity in the basin. It also noted that urban development and some poor wastewater treatment in the MSP metropolitan area contribute to the Minnesota River's existing water quality. However, missing in that assessment was the adverse effect failing SSTS in rural parts of the basin, which exacerbate the agricultural impacts on the river. Flooding also impacts water quality on the Minnesota River, as it erodes the soil surface and transports impaired water to floodplain lakes and streams.

Backwater effects from Lock and Dam No. 2 on the Mississippi River at Hastings, along with stream channelization work, have significantly altered the natural hydraulic characteristics of the lower Minnesota River (MPCA 1985). The resultant slower stream velocities and greater channel depths reduce atmospheric re-aeration potential, which reduces the river's capacity to assimilate pollutant loadings. The slower stream velocities also promote suspended matter settling (non-point source pollutants) from upstream. The decomposition of the settled organic matter creates an additional demand on the available dissolved oxygen in the river. In the relatively narrow channel of the lower Minnesota River, the turbulence and wake created by each towboat passage may also add to water quality problems by re-suspending bottom sediments and eroding streambanks.

The Minnesota River's poor water quality is one of the most significant and difficult water quality issues facing Minnesota.

#### *2.2.3.3.2 Trout Lakes and Streams*

The District contains several trout streams and lakes. The DNR designated these trout habitats because they have a stable supply of cold water, high oxygen concentrations, shade, and adequate nutrient inputs. These lakes and streams present both opportunities and problems for the District. The primary opportunity is recreational; trout fishing is a favorite pastime of many MSP metropolitan area residents. These streams and lakes present alternatives to outstate destinations.

Trout habitat is sensitive to development pressures associated with encroachment, increased stormwater rate, runoff volume, and non-point pollution transport. These affect the temperature and oxygen concentrations in trout habitat. Temperatures higher than 16°C-21°C (60°F-70°F) threaten trout health. According to Kohler and Hubert, most coldwater fish do not tolerate summer temperatures above 22°C (72°F) and fish growth declines rapidly at temperatures above 29°C (68°F) (Kohler & Hubert 1993). Trout need higher oxygen levels than other types of fish (DNR-Trout 1996). Kohler and Hubert state that oxygen concentrations should be at least 8 mg/l for rearing and 10 mg/l for egg and larval development (Kohler & Hubert 1993).

There is increasing concern that some of these trout lakes and streams are not viable to support trout in the near future. An example is trout stream #4 in Burnsville. Sustaining its viability is a concern given the proximity of this resource to an urban area, and the fact that it does not currently contain any trout species.

#### *2.2.3.3.3 Fens*

Some of the wetlands within the District are calcareous fens, which require specific hydrologic and chemical conditions to exist. Many factors threaten the health of calcareous fens, including changed groundwater conditions, stormwater runoff, sedimentation, and invasive plants.

These fens are highly dependent on the quantity, quality, and management of the groundwater that feeds them and on control of invasive species. The primary hydrology of fens is reliant on groundwater. However, an understanding of the contributing subsurface recharges areas for each fen is unknown. This makes it a challenge to be proactive in regulating appropriation and water quality controls. All of these details present a bigger issue of the deficiencies in established management requirements for these unique areas.

#### *2.2.3.3.4 Tributary Streams*

Many tributary streams enter the District from outside its boundaries. Urbanization and agricultural practices have created significant changes in tributary watersheds, particularly the streams that have large watershed areas outside the District. As a result, water quality problems such as erosion and sedimentation are transported into the District and to the Minnesota River. This points back to Issue 2 - Outside Influences, which was previously discussed.

#### *2.2.3.3.5 Lakes*

Dean and Snelling lakes are impaired for aquatic recreation (nutrients) and aquatic consumption (mercury), respectively. In addition, the majority of lakes within the District are floodplain or backwater lakes. Floodwaters from the Minnesota River contribute a large portion of the nutrients and sediments that enter these lakes. After floodwaters subside, the lakes are again separated from the river, trapping the high sediment and nutrient loads.

The TAC shared concerns about properly managing these floodplain lakes due to misunderstandings about their function, value, and lack of water quality data. Due to prolonged sedimentation in Coleman Lake from floodwater and other sources, its perceived function and value has changed and supports an endangered frog species.

#### *2.2.3.3.6 Wetlands*

Since many wetlands in the District are in the Minnesota River floodplain, they face the same water quality threats as the floodplain lakes and Minnesota River tributary streams. Because the wetlands act as natural holding ponds during periods of flooding, pollutants from the Minnesota River are deposited in them. In addition, these wetlands are being further deteriorated because of surrounding development pressures.

### **2.2.4 Issue 4 – Flooding and Floodplain Management**

#### **2.2.4.1 Flooding**

Flooding occurs when runoff from the landscape exceeds the capacity of natural and manmade storage systems. Excess runoff causes two scales of flooding; localized flooding in the upland stream reaches and municipal drainage systems within the District, and regional flooding affecting large segments of the Minnesota River.



Several factors leading to increased local and regional flooding can be discussed in terms of when they occur within the hydrologic cycle. The first part of the cycle is precipitation, which is a natural phenomenon. Large precipitation amounts and long duration lead to flooding, which are beyond the District’s control. The second part of the cycle, runoff from the landscape, is impacted by land use changes due to human activity. An example is the conversion in the last 150 years of prairie land in the upper areas of the Minnesota River basin to agricultural land, and the later conversion from agricultural land to urban and suburban areas in the lower reaches of the basin. The third part of the cycle, storage of runoff on the landscape, is also impacted by human activity and land use change. Many wetlands and other natural depressions in the upland portions of the basin have been filled and drained with subsurface tiling to accommodate agriculture.

The two scales of flooding are not mutually exclusive and can occur simultaneously. For example, high water levels in the Minnesota River can create a backwater condition, whereby flow in a tributary stream is backed up, causing flooding in upstream reaches.

Localized and Minnesota River flooding created infrastructure damage within the District. The most common types of damage are trail washouts, trail crossing damage, and sanitary sewer failure. This damage causes budgetary strain for the owners of this infrastructure. The USFWS, DOT, cities, and counties are among several owners of infrastructure within the District. In addition to repair costs, infrastructure damage can pose health and safety risks to District residents due to road closures.

Another issue caused mainly by Minnesota River and localized flooding is making recreational facilities inaccessible. Flooding can inundate boat landings, parks, and trails, causing unsafe fishing, boating conditions, and damaged trails.

Specific areas within the District subject to flooding and its associated impacts are identified below in Table 2-1 (mainly caused by either Minnesota River flooding, local flooding, or both).

**Table 2-1: Lower Minnesota River Watershed District Flooding Problem Areas**

Area	Main Cause of Flooding
Downtown Carver	Local flooding (Spring Creek), Minnesota River
TH 41 Between Chaska Levee and Gifford’s Lake	Minnesota River
Highway 101 (Old 169) and Shakopee River Crossing	Minnesota River
Old 212 near Moon Valley Gravel Pit	Minnesota River
Savage Business District near Credit River/Fire Station	Local flooding (Credit River)
Black Dog Road in Burnsville	Minnesota River
Depressional flooding in Mendota	Local flooding

#### **2.2.4.2 Floodplain Management**

The District, in partnership with USGS and the COE, published the Lower Minnesota Floodplain Study in 2004. The information contained in this report may be used as “Best Available Data” until FEMA produces new FIS maps of the affected communities. An issue occurred because some individuals seeking floodplain management information within the District consulted the Flood Insurance Rate Maps (FIRM) for communities that have not updated their FIS. Therefore, they are not using the “Best Available Data” despite the official FEMA publication usage. The District publishes the 2004 Study on its website and will continue to provide the “Best Available Data” to cities and counties when projects require this information.

Dakota County has updated FIRM maps, and an FIS report was finalized on June 18, 2010. This is the “Best Available Data” for the mapped flood hazard areas within Burnsville.

#### **2.2.5 Issue 5 – Erosion and Sediment Control**

Erosion is the movement of solids, mainly sediment and soil, in the natural environment. Within the District, erosion typically occurs due to water transport and has direct effects on downstream water quality. Erosion is a natural process, but within the District, it has increased due to human land use practices. Similarly, water quality within the District has been greatly impacted by human land use practices within the Minnesota River basin upstream of District boundaries. Examples of land uses which have caused both erosion and degradation of water quality within the District include deforestation, unmanaged construction activity, road-building, and agricultural practices. Land that is used for agriculture experiences a significantly greater rate of erosion than land under natural vegetation. This is important, because a vast majority of the Minnesota River basin upstream of the District is used for agriculture. Agricultural practices upstream also include subsurface drainage which can increase runoff rates and volume leading to bank erosion in the District.

Issues related to erosion and sediment control fall into four categories based on the location and type of erosion: 1) construction site erosion, 2) bluff erosion, 3) streambank erosion, and 4) mainstem erosion. The issues related to each type of erosion are described in further detail below.

##### **2.2.5.1 Construction Site Erosion**

Construction erosion occurs when vegetated, stabilized ground surface is disturbed for earth grading and the construction of roads, buildings, parking lots, underground utilities, and other man-made structures. Several best management practices have been developed that can greatly minimize or even negate construction site erosion. However, severe construction site erosion occurs within the District when these practices are implemented improperly. Poor site management is the primary issue related to construction site erosion in the District.

### **2.2.5.2 Bluff Erosion**

The District is home to several miles of bluffs that outline the Minnesota River valley. The main factors that have led to bluff erosion include extreme slopes coupled with human land use above the bluff. Some bluff erosion is natural, but issues identified by the District are driven by human land use practices near the bluffs. These issues are a) insufficient building setbacks above the bluff line, b) insufficient vegetation management, c) the lack of buffers above the bluff line, and d) concentrated channel flow over the bluffs due to drainage practices implemented by homeowners residing on the bluffs.

In 2006 and 2007, the District hired the Minnesota Civilian Conservation Corps (MCCC) to inventory gullies within the District. The inventory identified gullies with current and potential erosion and pollution issues. Cities then reviewed the information and chose the top 3-4 public sites that needed immediate attention. The Cities completed feasibility analyses. As a result, four cooperative projects with the cities of Eden Prairie and Bloomington have been completed: 1) Bloomington Parkers Picnic Area, the District contributed \$22,265 for the restoration of a ravine including fill, grading, plantings and erosion control; 2) Bloomington Minnesota River Valley Washout, the District contributed \$98,214 for stream bank restoration on an unnamed stream near Lyndale Avenue and the Minnesota River; 3) Eden Prairie Area 4, the District contributed \$40,412 for stream bank restoration on Purgatory Cree; 4) Eden Prairie Area 3 River Bank failure, the District contributed \$78,704 for a feasibility study of this area of concern at R.M. 19.6 on the left descending bank. Appendix K contains the results of the gully inventory.

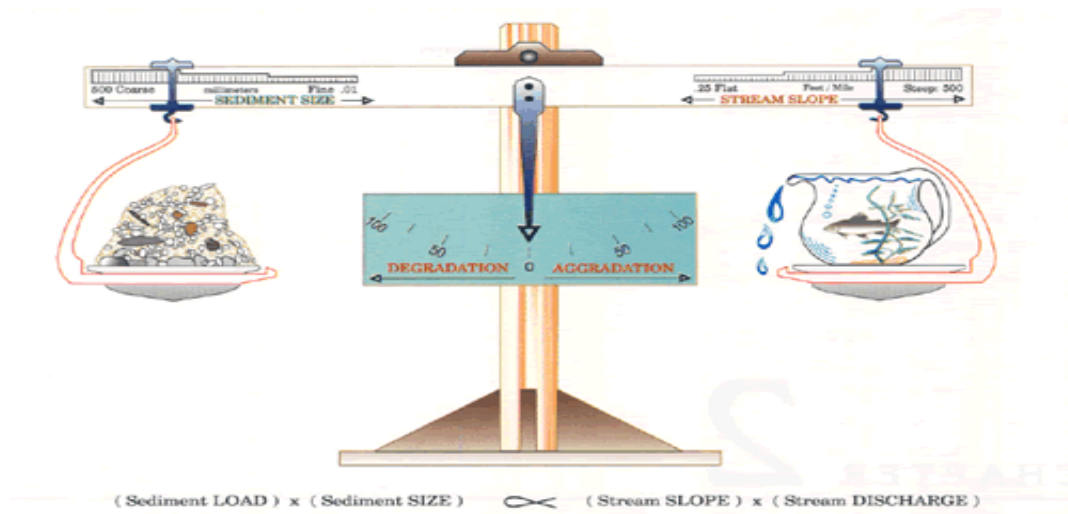
### **2.2.5.3 Streambank Erosion**

Streambank erosion within the District is occurs naturally but accelerates by human activities. Streambank erosion on many Minnesota River tributary streams is driven by two main issues: a) the lack of stream buffers and, to a greater extent, b) significant changes in the hydrologic characteristics of the watershed, in and outside of the District.

Streambank erosion (due to a lack of stream buffers) occurs mainly within urban and suburban areas. Issues arise when property owners remove natural vegetation from the stream banks which accelerates bank erosion.

Changes in hydrologic characteristics of the watershed due to human land use practices is the primary issue surrounding streambank erosion within the District. Stream equilibrium is a method for classifying aggradation and degradation. Aggradation refers to excess sediment deposition, and degradation refers to excess sediment erosion. Lane's scale, shown on Figure 2-4, modified by Rosgen, equates the product of sediment load and sediment size with the product of stream slope and stream discharge (Rosgen). The dynamic equilibrium of natural erosion and deposition is upset when one of these variables shifts excessively causing instability.

Figure 2-4: Lane's Scale of Stream Equilibrium



Stream discharges within the District have increased in the past, tipping stream equilibrium towards degradation and erosion. Stream stability can be directly correlated to the frequency of bankfull flow. Streams are expected to remain stable when the bankfull channel contains the peak flow from a 1-year to 2-year storm event. Wolman and Leopold suggested that the channel-forming discharge has a recurrence interval of 1 to 2 years (Wolman & Leopold 1957). A stream that receives bankfull runoff more frequently is likely to respond with bank erosion and changes in channel alignment. These conditions lead to loss of streamside zones, potential damage to surrounding properties, and large quantities of sediment transported downstream (Bonestroo 2007).

Stormwater management within the District's urbanized areas focused on managing discharge rates higher than bankfull flows in streams tributary to the Minnesota River. High frequency, channel-forming flows have increased, causing stream instability and degradation. An issue is that stormwater management within the District has typically focused on controlling flooding and not on mitigating stream instability and degradation.

#### 2.2.5.4 Mainstem Erosion

Mainstem erosion remains an issue in the District, due mainly to upstream agricultural practices. Subsurface drainage practices in the Minnesota River basin parallel the effect of urbanization on tributary streams within the District, as described above. Subsurface drainage practices increase the amount of water in the channel, forming higher frequency flows in the Minnesota River, which cause bank instability, degradation, and erosion. Runoff volume has increased significantly in the Minnesota River at Jordan since the 1980s (Graph 1-1). This has resulted in a doubling of the annual TSS from the 1980s to the present (Graph 1-2). The main problem the District faces in dealing with this issue is that it lacks the jurisdictional authority to promote management changes.

### **2.2.6 Issue 6 – Groundwater**

Groundwater protection and management are important because residents and businesses within the area rely on groundwater for domestic, municipal, industrial, and agricultural water supplies. For the District, the most important aspect of groundwater protection and management is its effect ~~affect~~ on unique natural resources, especially fens and trout streams. The quality of these resources relies heavily on the quality and quantity of groundwater supplying them. Issues for the District regarding groundwater protection and management revolve around the lack of understanding of groundwater and surface water interactions and their effect ~~affect~~ on unique natural resources of the District.

### **2.2.7 Issue 7 – Commercial and Recreational Navigation**

Commercial and recreational navigation issues within the District fall into four categories: a) co-existence of commercial and recreational navigation, b) dredge material management, c) financing, and d) the effect of river traffic on water quality. Issues within each category are described below.

#### **2.2.7.1 Co-Existence of Commercial and Recreational Navigation**

The Minnesota River within the District is an important water resource for both commerce and recreation. Commercial activities include barge towing and tour boats. Recreational activities include fishing and the use of pleasure boats, canoes, and personal water craft. Safety becomes an issue where commercial and recreational uses intersect.

Recreational users must be educated on safe river navigation practices, while commercial users must be aware of the different habits of recreational users. Recreational access becomes a complicating factor surrounding this issue, because the District believes there are not sufficient access points for recreation. However, greater accessibility could increase safety issues on the river. Therefore, navigational safety and increased recreational access must be considered as interrelated issues.

#### **2.2.7.2 Dredge Material Management**

Dredge material management, as it relates to commercial navigation, is the cornerstone of the District's history and continues to persist as a main responsibility today. Significant sediment quantities are deposited into floodplain lakes and the Minnesota River channel from upstream sources, which necessitates dredging for commercial navigation. Between 2000 and 2005, an average of 33 percent of the TSS load originating from sources upstream was stored in the Minnesota River channel and floodplain between Jordan and Ft. Snelling (MPCA 2009).

The COE published a Dredge Material Management Plan (DMMP) in March 2007 that addressed long-term management of dredging and placement site requirements on the Minnesota River. It included public and private dredging requirements. Existing plans or placement sites formed the baseline condition, but the DMMP looked at additional requirements to satisfy placement of all material projected for the planning period (2007-2034).

During the DMMP development, several problems occurred while evaluating sites below the I-35W Bridge. The DMMP's emphasis was changed to address only the area above the I-35W Bridge. The COE will continue to work on the area below the I-35W Bridge, and supplemental DMMP will be furnished when completed.

The DMMP developed and evaluated several combinations of alternatives. The alternatives were ranked in order of preference for implementation. They were ranked this way because the District is responsible for implementation, and this method would give it the most flexibility in negotiating agreements. The District is currently implementing the DMMP's recommended alternative for dredging above the I-35W Bridge.

If the recommended alternative is no longer possible in the future, implementation will proceed with the next preferred alternative identified in the DMMP's Summary of Alternative Comparisons. The District will be responsible for documenting why implementation is not possible with a reasonable effort to implement the first preferred alternative, prior to pursuing the second preferred alternative.

In addition to providing the District a clear direction regarding which placement sites to acquire and what is required to make sites usable, the DMMP outlines authorities and responsibilities for the agencies involved. The issues surrounding dredge material management are twofold: 1) dredge material site acquisition and 2) dredge material handling. Specific issues concerning dredge material site acquisition include the need to acquire a site for dredging activities, either between R.M. 1.0 and R.M. 2.0, near Pike Island, or between R.M. 4.0 and R.M. 5.0. Space constraints due to the abundance of protected federal and state land in the area complicate site acquisition. Further, there is limited information from the COE as to whether it is financially beneficial to acquire a new site, or to move material east to a COE-operated site in St. Paul. The answer is unclear because the material would be transported greater than four miles, which would incur a surcharge fee.

The District continues to work with the COE, MPCA, and private industry on an operation and maintenance plan for the R.M 14.2 Site. The District's goal for working with these agencies and private industry is to advertise beneficial use(s) of the dredge material. The District, if successful, could operate the site much like a public utility. While the District is not directly involved with dredging operations, which are the responsibility of the COE, it becomes their responsibility to assist the COE as the designated local sponsor for the 9-Foot Channel. Issues exist for the COE in the administration and funding of dredging operations at the Federal level.

After District possession, issues arose concerning dredge material handling. These issues include limited data about the material's beneficial uses, potential liability from pollutants in the material, and pressure to take private dredge material. In addition, the District does not have an operation and management plan for the site at R.M. 14.2.

### **2.2.7.3 Financing**

Financing dredge material management from the 9-Foot channel equates to the acquisition, operation, and maintenance of public dredge material storage sites. As the local sponsor, the District is responsible for providing space for dredge material. This dredge material is taken from the 9-Foot channel by the COE within the District's boundaries.

The District established a 9-Foot channel fund to finance these activities. The fund was initially established by special assessment and supplemented by ad valorem tax in 1980. Recently, the fund has been depleted and the District needs to use other funding mechanisms to restore it. There is a difference of opinion among the Managers as to which mechanism should be used to restore the fund: by an ad valorem tax (assess all properties in the District) or special assessment (assess the benefitted users).

The Mississippi River Project, enacted by the U.S. Congress in the 19<sup>th</sup> century, provides funding to the COE for dredging operations on the Mississippi River. In 1958, the Project began providing the same funding to the COE for dredging on the Minnesota River. The funds have separate mechanisms, with the Mississippi River Project receiving significantly more funds. In the past, funds to dredge the Minnesota River were insufficient, but the COE was able to borrow from the Mississippi River Project fund. Due to a congressional change, the COE can no longer reallocate funds from the Mississippi River Project to the Minnesota River Project for channel maintenance. The District could have a problem in the future if the Minnesota River channel maintenance appropriations are reduced.

In November of 2010, the Board of Managers passed resolution number 001-2010; a resolution requesting that the United States Congress modify the existing authorizations for the Minnesota River 9-Foot Navigation Channel Project and the Mississippi River 9-Foot Navigation Channel Project to combine them into a single authorization. This resolution asks the United States Congress for a more efficient and cost-effective use of channel maintenance funding for the Minnesota River and to formally recognize it is an integral part of the Upper Mississippi River Navigation System.

#### **2.2.7.4 The Effect of River Traffic on Water Quality**

The District identified an issue regarding the effect of river traffic on water quality, fisheries, and wildlife. According to a 2001 COE study, hydraulic disturbances by recreational vessel traffic include vessel wakes, propeller jet turbulence, propeller entrainment of water, which causes sediment resuspension in shallow areas and bank erosion (Wilcox 2001). Ecological effects of these hydraulic disturbances on the Minnesota River include entrainment and impingement of aquatic plants and wildlife, fish stranding, and habitat disturbance.

#### **2.2.8 Issue 8 – Public Education and Outreach**

Limited public participation in District activities and lack of a structured education and outreach plan were identified as issues by the Managers and the TAC. One of the concerns was the need to enhance public participation and educate citizens on the District's goals and policies without duplicating efforts.

As part of this Plan's development, a CAC was formed. The CAC's directive from the Managers is to examine and advise on outreach activities for this Plan, with the goal of developing a formal Education Plan.

#### **2.2.9 Issue 9 – Potential Problems**

Issues described thus far are immediate and ongoing. This section describes issues identified by the District that may happen in the future.

The first potential issue is related to dredge material management. The District could face a liability if any constituent found in the dredge material, while currently not defined as a hazardous material or pollutant. The "chain of custody" and "cradle to grave" concepts within federal hazardous waste and pollutant regulations could potentially make the District responsible for future remediation at locations where dredge materials were eventually used.

The second potential issue relates directly to the 9-Foot channel funding discussion. The District may be unable to support navigation if it is not clear who will pay for commercial navigation maintenance.



A third potential issue is a general concern about future, unfunded federal mandates for entities outside the District, and how the District would help finance mandate implementation. The fourth potential issue is how the District will address upcoming TMDL implementation plans. How will the District assist other entities in achieving the goals set forth in implementation plans, and will the District be responsible for any of these?

## **2.3 EXISTING REGULATORY CONTROLS**

This section describes the controls in place that regulate aspects of the issues previously discussed.

### **2.3.1 Water Quality**

Water quality impacts are regulated at the federal, state, and local levels within the District. The majority of these controls are driven by the Clean Water Act, the primary federal law governing water pollution. In addition, state and local governments have independently implemented controls aimed at reducing water quality impacts. Regulatory controls concerning water quality in the District are described below.

#### **2.3.1.1 National Pollutant Discharge Elimination System (NPDES)**

The NPDES is a federal program established under the Clean Water Act (CWA), aimed at protecting the quality of nation's waterways. The NPDES is administered by MPCA and delegated by the U.S. Environmental Protection Agency (EPA). The NPDES regulates three main areas: 1) point source pollution, 2) non-point source pollution (construction and industrial activities), and 3) municipal separate storm sewer systems (MS4).

##### *2.3.1.1.1 Point Source Pollution*

Facilities that discharge wastewater to a surface or groundwater of the state are regulated under the NPDES/State Disposal System (SDS) Permit. This permit establishes the terms and conditions that must be met for point source discharges. The permit is jointly issued under two programs: NPDES and SDS. The SDS is a state program established under M.S. 115. In Minnesota, when both permits are required, they are combined into one NPDES/SDS Permit administered by the MPCA.

##### *2.3.1.1.2 Construction Activities (Non-point Source Pollution)*

Activities related to construction that do not discharge directly to surface waters of the state are considered non-point source discharges of pollutants. The MPCA regulates construction activities under an NPDES/SDS general permit for sites that disturb:

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

Regulated projects under the NPDES construction stormwater permit are required to develop a stormwater pollution prevention plan (SWPPP). The SWPPP must 1) identify a knowledgeable person to oversee the project, 2) incorporate design and activity requirements, 3) contain discussion of temporary and permanent erosion and sediment control best management practices (BMPs), 4) include a site map, 5) identify areas not to be disturbed, where construction will be phased to minimize duration of exposed areas, and where surface waters and existing wetlands will receive stormwater runoff, and 6) include information on final stabilization methods.

Most construction activities are regulated under MPCA's general NPDES stormwater permit for construction activity, but some construction sites are regulated under individual permits.

#### *2.3.1.1.3 Municipal Separate Storm Sewer Systems (MS4)*

The stormwater program for MS4s is designed to reduce sediment and pollution that enters surface and groundwater from storm sewer systems to the maximum extent practicable. Stormwater discharges associated with MS4s are regulated through the use of NPDES permits. An MS4 is a conveyance (or system of conveyances) owned or operated by a city, township, or county and used for collecting or conveying stormwater.

MS4s are required to develop and implement a stormwater pollution prevention program to reduce the discharge of pollutants from their storm sewer system to the maximum extent practicable. The stormwater pollution prevention program must cover six minimum control measures: public education and outreach, public participation, illicit discharge detection and elimination, construction site stormwater runoff control, post-construction stormwater management in new development and redevelopment, and pollution prevention/good housekeeping for municipal operations. The MS4 must identify BMPs and measurable goals associated with each control measure. An annual report on the implementation of the stormwater pollution prevention program must be submitted each year.

#### **2.3.1.2 Loading Assessment and Nondegradation Report**

In recent years, MPCA modified the requirements of the NPDES permit for selected MS4s, including several municipalities within the District. In addition to the required stormwater pollution prevention program described above, several MS4s were required to assess the change in stormwater discharge loading for their permitted area using a pollutant loading water quality model. Those MS4s that had significant new or expanded discharges were required to complete a Nondegradation Report and incorporate its findings in BMPs that address nondegradation in their stormwater pollution prevention program. As part of this process, MPCA determined that MN Rules 7050.0185 directs them to consider flow volume as a pollutant and MS4s had to address flow volume changes that have resulted from increased urban development. The MS4s were required to identify mitigation measures to ensure that flow volumes do not exceed 1988 volumes to avoid negative environmental impacts typically caused by increased flows.

#### **2.3.1.3 Clean Water Act: Section 316**

Section 316 of the CWA regulates thermal pollution discharges--Section 316(a)-- and requires standards for cooling water intake structures-- Section 316(b). These standards are applicable to power plants and other industrial facilities. In Minnesota, facilities regulated under Section 316 of the CWA coordinate with MPCA to ensure that regulations are followed.

#### **2.3.1.4 Clean Water Act: Section 303(d)**

Section 303(d) of the CWA requires states to:

- Assess all waters of the state to determine if they meet state water quality standards
  - List waters that do not meet standards
  - Conduct TMDL studies in order to set pollutant reduction goals needed to restore waters
- In Minnesota, MPCA is responsible for assessing waters, listing impairments, and conducting TMDLs. MPCA also coordinates closely with other state and local agencies on restoration activities. Section 1 of this plan lists the waters within the District, which are listed under Section 303(d).

#### **2.3.1.5 Public Waters Work Permit Program**

The DNR Waters Division oversees the administration of the Public Waters Work Permit Program. This program, which began in 1937, regulates water development activities below the ordinary high water level (OHWL) in public waters and public waters wetlands. Examples of development activities regulated under this permit include filling, excavation, shore protection, bridges, culverts, structures, docks, marinas, water level controls, dredging, and dams.

#### **2.3.1.6 Water Appropriation**

The DNR Division of Waters regulates surface water appropriations by requiring a permit for all users withdrawing more than 10,000 gallons of surface or groundwater per day, or 1 million gallons annually. All active water appropriation permit holders are required to measure monthly water use and report water use yearly. In order to safeguard water availability for natural environments and downstream users, the DNR can limit appropriations under certain low-flow conditions.

#### **2.3.1.7 Subsurface Sewage Treatment Systems (SSTS) Program**

The MPCA is responsible for the SSTS program administration formally known as the ISTS program. SSTS is regulated by M.S. [115.55](#) and [115.56](#). The SSTS program's goal is to protect public health and the environment through adequate dispersal and treatment of domestic sewage from dwellings or other establishments generating volumes of less than 10,000 gallons per day. To achieve that goal, MPCA periodically revises MN Rules [Chapters 7080, 7081, 7082, 7083](#), assists in interpreting those rules, and administers a statewide SSTS Certification and Licensing Program. The SSTS Certification and Licensing Program requires SSTS installers, maintainers, service providers, designers, advanced designers, inspectors, or advanced inspectors to obtain a license to practice.

#### **2.3.1.8 Feedlot Program**

The MPCA is the primary regulator of the collection, transportation, storage, processing, and disposal of animal manure and other livestock operation wastes. In all of the counties within the District—except for Hennepin, where MPCA is primarily responsible—feedlots are regulated under a cooperative agreement between MPCA and county government. County feedlot programs are responsible for implementing state feedlot regulations for facilities with fewer than 1,000 animals, or those that do not require federal permits. County responsibilities include: registration, permitting, inspection, education and assistance, and complaint follow-up.

#### **2.3.1.9 Local Water Quality Regulation**

Municipalities and counties within the District have adopted water quality requirements either in ordinances and codes, or within their respective surface water management plans. Much of this regulation is aimed at setting standards for development and redevelopment and enforced during the approval process. In addition, municipalities and counties have adopted shoreland management regulations, which are also enforced during the development and redevelopment process.

### **2.3.2 Unique Natural Resources**

Regulatory controls concerning unique resources such as calcareous fens and trout streams within the District are described below.

#### **2.3.2.1 Trout Stream Management**

The DNR is primarily responsible for trout stream management within the District. The controls used by the DNR to manage these resources consist of trout stream designation (MN Rule 6264), fishing regulations (M.S. 97C.021), and easement acquisition. In addition, water quality regulations described earlier in this section are triggered for areas that drain to designated trout streams. NPDES MS4 permit requirements can also be triggered for those MS4s that drain to trout lakes or streams, which would otherwise not require them (MN Rule 7090). Trout lakes are also protected under MN Rule 7050: “Nondegradation for outstanding resource value waters,” which is administered by MPCA. This rule requires that new or expanded discharges to waters that flow into outstanding resource value waters be controlled so as to assure no deterioration in the downstream-outstanding resource value water quality. The rule also protects against thermal impacts.

### **2.3.2.2 Fen Management**

Fen protection in the District is regulated under MN Rule 7050: “Nondegradation for outstanding resource value waters,” which is administered by MPCA. Calcareous fens are classified as outstanding resource value waters under this rule. This rule requires that “New or expanded discharges to waters that flow into outstanding resource value waters be controlled so as to assure no deterioration in the quality of the downstream outstanding resource value water.”

State rules regarding wetland conservation (MN Rule 8420), administered by BWSR and implemented by local government units, provide for the identification and listing of calcareous fens. In addition, these rules give BWSR the power to approve management plans that restore or upgrade a previously damaged calcareous fen.

The DNR is responsible for fen identification pursuant to MN Rule 8420.102, and restricts off-road vehicle use in fens. The DNR also has a role in fen protection through the acquisition, designation, and management of fen areas as scientific and natural areas (SNA).

### **2.3.2.3 Minnesota River**

The primary regulatory control concerning the Minnesota River is Section 10 of the Rivers and Harbors Act and is described below.

#### *2.3.2.3.1 Rivers and Harbors Act: Section 10*

This program regulates the structure placement affecting the Minnesota River’s navigable waters. The COE is the agency responsible for administering this program.

#### ~~*2.3.2.3.2 Minnesota River Basin Joint Powers Board*~~

The Minnesota River Basin Joint Powers Board (MRBJPB) was created in 1996 at the behest of Governor Arne Carlson and includes representatives from all 37 counties in the river basin. Their stated mission was to make the Minnesota River suitable for fishing and swimming by the year 2005 (M.S. 103F.378). While the MRBJPB has no regulatory authority, they provide leadership, build partnerships, and support efforts to improve and protect water quality in the Minnesota River Basin. According to state statute, the duties of the MRBJPB include:

- Coordinate cleanup goals for the Minnesota River
- Advise on the development and use of monitoring in the Minnesota River
- Conduct public meetings
- Conduct an ongoing information and education program
- Provide periodic reports and budget requests
- Advise on developments of projects
- Administer the distribution of project implementation funds

### **2.3.3 Wetlands**

There are federal, state, regional, and local regulations pertaining to wetland management and protection within the District. These programs are described in detail below.

#### **2.3.3.1 Clean Water Act: Section 404**

This program regulates excavation of wetlands and the discharge of dredged or fill material into waters of the United States, which includes wetlands. There are two types of Section 404 permits: regional and nationwide general permits and individual permits. The COE has primary responsibility for administering the program, but the EPA can appeal to a higher COE authority or veto a COE decision.

#### **2.3.3.2 Food Security Act of 1985: Swampbuster**

The Swampbuster program regulates the alteration of wetlands for agricultural use and prohibits farms who receive federal subsidies from draining wetlands. Alteration of a wetland for agricultural use results in ineligibility for all government price and income support programs.

#### **2.3.3.3 Wetland Conservation Act of 1991 (WCA)**

The intent of the WCA is to promote no net loss of wetlands. BWSR oversees the administration of WCA within the state, while the DNR provides enforcement. Cities and counties within the District have been designated as the LGUs or administrators of the WCA at the local level. DOT is the WCA LGU on its rights of way. WCA rules regulate some excavation. WCA rules require that drained and filled wetlands be replaced at a minimum ratio of 1:1 in agricultural areas and 2:1 in non-agricultural areas. The 1:1 replacement ratio only applies if the land is kept in agricultural use for 10 years after replacement. LGUs may have stricter wetland regulations. Amendments to the WCA in 1994 allow for preparation of wetland management plans by LGUs that may give more flexibility through a more regional wetland analysis. The DNR is involved in the WCA enforcement and is responsible for identification, protection, and management of calcareous fens.

### **2.3.4 Floodplain Management**

Floodplain management responsibilities in the District are shared by FEMA, the state, and LGUs. The NFIP drives floodplain management efforts at all levels and is described below.

#### **2.3.4.1 National Flood Insurance Program**

The NFIP was created through the National Flood Insurance Act of 1968. The program enables property owners in participating communities to purchase flood insurance protection from the government. This insurance provides an alternative to disaster assistance and meets the escalating costs of repairing damage to buildings and their contents caused by floods. NFIP participation is based on an agreement between local communities and the federal government, which states that if a community will adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in Special Flood Hazard Areas (SFHA), the federal government will make flood insurance available within the community as financial protection against flood losses.

All of the local communities within the District participate in the NFIP.

#### **2.3.4.2 Local Flooding Regulation**

Most LGUs within the District have also adopted rate control standards and freeboard requirements to protect property from flooding outside of the SFHAs designated by the NFIP.

### **2.3.5 Erosion and Sediment Control**

#### **2.3.5.1 City and County Regulation**

Several cities and counties within the District have adopted bluff setbacks, steep slope ordinances, and vegetation management requirements in an effort to reduce bluff erosion. In addition, erosion and sediment control measures have been established within city codes, ordinances, and surface water management plans in an effort to meet NPDES requirements.

### **2.3.6 Groundwater**

Groundwater within the District is regulated by the DNR and the Department of Health (DOH). Regulatory controls handle both groundwater quality and quantity and are described below, with the exception of water appropriation which was already described.

#### **2.3.6.1 Wellhead Protection**

Wellhead protection prevents drinking water pollution by managing potential sources of contamination in the area that supplies water to a public well. The DOH administers the wellhead protection requirements found in M.S. 4720. Under these rules, local governments who own and operate public drinking supply wells are required to complete a wellhead protection plan. The wellhead protection plan includes a delineation of the wellhead protection area and an assessment of the existing land and water impacts on the aquifer serving the well. Specific wellhead protection requirements vary for the different classifications of public water systems in Minnesota.

#### **2.3.6.2 Abandoned Wells**

Decommissioned wells that have not been properly sealed can be a source of groundwater contamination, potentially affecting nearby drinking water wells. The DOH administers M.S. 103I.301 which spells out well-sealing requirements. Counties within the District also have grant programs which assist property owners to seal abandoned or unused wells properly.

### **2.3.7 Commercial and Recreational Navigation**

#### **2.3.7.1 Safety**

The DNR administers the Boat and Water Safety program, which provides the public with safety information, collects and interprets statistical data on boat and water accidents and boating in general, and handles the free mandatory boating and safety education program for youth. The Minnesota Boating Guide, published by the DNR, summarizes Minnesota's boating laws and regulations. Another DNR publication summarizes the state's laws governing personal watercraft. The U.S. Coast Guard and Coast Guard Auxiliary offer courses that provide instruction to boaters at all levels. Information on these courses is available on the DNR website.

#### **2.3.7.2 Dredge Material Management**

COE policy dictates the development and implementation of Dredged Material Management Plans (DMMP) which satisfy the long-term material placement needs for COE navigation projects. The objective of the DMMP is to prepare a coordinated, long-term plan for managing dredging and placement site requirements. A DMMP has been prepared for the Minnesota River in Scott, Hennepin, and Dakota counties above the I-35W Bridge. A DMMP will need to be prepared for the Minnesota River below the I-35W Bridge.

#### **2.3.7.3 Financing**



The District has several options available to fund channel maintenance (either directly or indirectly) through financing of other District operations and improvements. These options are listed below and described in detail in future sections of this Plan.

- District-wide Ad Valorem
- Capital Improvements Funding
- Stormwater Utility
- Special Assessment
- State Funding

## **2.4 MANAGEMENT GAPS**

The existing regulatory controls were presented to determine their adequacy in addressing the issues identified by the District through the planning process. Based on existing programs and an analysis of their ability to address the District's issues, management gaps were generated and are described below. These management gaps exist when neither the District nor any other entity is addressing a particular aspect of an issue.

### **2.4.1 Issue 1 – Unclear Role of District**

As the District evolved, so has its role and responsibilities. That shift, coupled with expectations and the irregular shape of the District, has left a couple of notable management gaps. The 9-Foot channel maintenance has driven the District's role historically. However, the District's role has shifted and is now required to address various water quality and quantity issues within its boundary. Exacerbating this issue is that the District's boundary does not follow a hydrologic boundary and therefore is limited in how it can take on expected roles beyond channel maintenance. While stakeholders perceive the District as the lead agency in many roles related to water quality and quantity, it does not have the jurisdictional control necessary to address many of those roles.

### **2.4.2 Issue 2 – Outside Influences**

The District's geography and the upstream watershed draining to it make it highly susceptible to outside influences. The District has limited control over many activities affecting water quality and quantity issues within the District. Management gaps arising from the size disparity between the Minnesota River Basin and the District's jurisdictional area include: unregulated areas and land management practices in many areas of the basin and non-uniform standards, especially between urban and rural areas of the basin.

- ~~● Lack of regulatory authority on the part of the MRBJPB, the sole entity charged with addressing water quality and quantity issues over the entire Minnesota River Basin. The MRBJPB also has limited ability to raise funds to address water quality and quantity issues.~~

### **2.4.3 Issue 3 – Water Quality**

#### **2.4.3.1 Non-Point Source**

##### *2.4.3.1.1 Land Use Management*

The District reviews projects within its jurisdiction to ensure that they meet their water quality policies. Other land development permitting entities in the District forward plans to the District for comment. A management gap exists here because the District relies on other entities to both submit projects for review and incorporate its comments. The gap is review authority for all projects affecting sensitive resources. The current review process often does not provide adequate protection.

The District has signed memorandums of understanding (MOUs) with LGUs in its jurisdiction to enforce Districts policies. The District needs to ensure that these MOUs are being properly executed by the LGUs.

#### *2.4.3.1.2 Use of Water Quality Data*

The District has sponsored itself in cooperation with other water quality data collection efforts. However, some of this information has not been used as part of any analysis and therefore is of little use in documenting overall trends, which can assist in making informed management decisions.

#### *2.4.3.1.3 Minnesota River Basin*

This gap is related to non-point water quality management in the agricultural areas of the Minnesota River Basin that drain to the District. While most urbanizing areas have adopted and enforced water quality standards and practices, agricultural stormwater quality has gone relatively unregulated. The gap is the lack of a regulatory body with the leverage and financial capability necessary to address Basin-wide issues. Because the gap encompasses many more entities than just the District, it must be addressed at a higher level. The District has initiated a dialogue with representatives at the state legislature to begin addressing this issue through a basin commission.

#### **2.4.3.2 Point Source**

The management gap identified for point source water quality issues involves point source pollution from septic systems within the Minnesota River Basin. According to the Lower Minnesota River Dissolved Oxygen TMDL, approximately 20,000 individual septic systems flow untreated to surface water in the Basin. The management gap is that there is no single entity in charge of addressing cleanup of these unregulated discharges.

#### **2.4.4 Issue 4 – Flooding and Floodplain Management**

Two management gaps related to flooding and floodplain management have been identified and are described below:

- Inconsistent runoff peak rates and infiltration standards are being enforced within the District's jurisdiction. The District has adopted peak runoff rate control standards for projects requiring review but has not adopted infiltration standards. Infiltration standards can reduce runoff volumes which, in some instances, can help mitigate localized flooding.
- The District lacks authority to regulate runoff outside of its boundaries.

#### **2.4.5 Issue 5 – Erosion and Sediment Control**

Three management gaps have been identified for issues related to erosion and sediment control in the District.

#### **2.4.5.1 Bluff Erosion**

While many of the cities and counties within the District have vegetation management standards, the standards are inconsistent. In addition, the District has not established vegetation management standards addressing practices such as vegetative cutting, clearing on bluffs, and steep slopes

#### **2.4.5.2 Streambank Erosion**

The District and other entities do not have management controls in place on streams not identified as trout streams.

#### **2.4.5.3 Mainstem Erosion**

The District has sponsored studies to determine BMPs to combat mainstem bank erosion. However, the source of mainstem erosion is mostly due to increased runoff rates and volume originating outside of the District.

#### **2.4.6 Issue 6 – Groundwater**

Groundwater is vital to many of the unique resources in the District, mainly trout waters and fens. Groundwater resources are currently managed by the DOH and the DNR with a focus on human consumption; fen and trout stream recharge areas are not specifically identified or regulated. This represents a management gap. Because these areas have not been identified, they cannot be protected to ensure the health of the unique natural resources they support.

#### **2.4.7 Issue 7 – Commercial and Recreational Navigation**

Management gaps have been identified for several issues related to commercial and recreational navigation.

##### *2.4.7.1.1 Navigational Safety*

While the DNR and the US Coast Guard provide navigational safety resources to both commercial and recreational watercraft operators, much of this information is not readily available to the average recreational user.

##### *2.4.7.1.2 Effect of Boat Traffic*

No entity regulates boat traffic on the river with the intent of addressing water quality and mitigating the oftentimes detrimental effects of boat wake.

##### *2.4.7.1.3 Beneficial Use for Dredge Material*

The District has acquired a site for temporary dredge material disposal and storage. To effectively manage the dredge material in the long term, the District must identify uses for the material.

#### **2.4.7.2 Channel Maintenance Fund**

The District must decide how to restore the 9-Foot channel fund. Alternatives to an ad valorem tax and a special assessment have been, and will continue to be, examined. In addition, the 4-foot channel needs attention. Potentially, a maintenance plan needs to be developed for the 4-foot channel.

#### **2.4.8 Issue 8 – Public Education and Outreach**

The District maintains a website with educational information and actively participates in regional education programs and events. Awareness is growing among the public of how actions within the District affect the river and other unique natural resources.