Vermillion River Watershed 2026 – 2035 Management Plan

Adopted XX

Acknowledgments

The Vermillion River Watershed 2026 – 2035 Watershed Management Plan was approved by the Minnesota Board of Water and Soil Resources on XX and adopted by the Vermillion River Watershed Joint Powers Board on XX. This is the third-generation plan. In accordance with Minnesota Statutes and Rules, this Plan was developed by Vermillion River Watershed Joint Powers Organization staff and Joint Powers Board with input and review by the Watershed's Community Advisory Committee, Technical Advisory Committee, interested citizens, community groups, and partnering agencies and organizations. The following organizations were provided opportunities to review and comment on the Plan:

Cities

- Apple Valley
- Burnsville
- Coates
- Elko New Market
- Empire
- Farmington
- Hampton
- Hastings
- Lakeville
- Rosemount
- Vermillion

Counties

- Dakota County
- Scott County

Townships

- Castle Rock Township
- Douglas Township
- Eureka Township
- Hampton Township
- Marshan Township
- New Market Township
- Nininger Township
- Ravenna Township
- Vermillion Township

Soil and Water Conservation Districts

- Dakota County Soil and Water Conservation District
- Scott Soil and Water Conservation District

State/Regional Review Agencies

- Metropolitan Council
- Minnesota Board of Water & Soil Resources
- Minnesota Department of Agriculture
- Minnesota Department of Health
- Minnesota Department of Natural Resources
- Minnesota Department of Transportation
- Minnesota Pollution Control Agency

Additional Reviewers

- Twin Cities Trout Unlimited

Certifications

This Plan was created under the direct guidance of the Vermillion River Watershed Joint Powers Board Chair, Administrator, and Co-Administrator.

Mike Slavik, Joint Powers Board Chair **Date**

Travis Thiel, Administrator **Date**

Melissa Bokman Ermer, Co-Administrator **Date**

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List of Acronyms

ACRE	Agricultural Chemical Reduction Effort
AIG	Accelerated Implementation Grant
AIS	Aquatic Invasive Species
AMA	Aquatic Management Area
BMP	Best Management Practice
BWSR	Minnesota Board of Water and Soil Resources
CAC	Community Advisory Committee
CAMP	Citizen Assisted Monitoring Program
CIP	Capital Improvement Program
CPCA	County Park Conservation Area
CPL	Conservation Partners Legacy
CVA	Climate Vulnerability Assessment
CWF	Clean Water Fund
DCSWCD	Dakota County Soil and Water Conservation District
DWSMA	Drinking Water Supply Management Area
DNR	Minnesota Department of Natural Resources
EAB	Emerald Ash Borer
ECOC	Emerging Contaminants of Concern
ECS	Ecological Classification System
EPA	United States Environmental Protection Agency
ERA	Emergency Response Area
GIS	Geographic Information System
HOA	Homeowner's Association
HSG	Hydrologic Soil Group
HUC	Hydrologic Unit Code
IBI	Index of Biological Integrity
JPA	Joint Powers Agreement
JPB	Joint Powers Board
LA	Load Allocation
LGU	Local Government Unit
LID	Low Impact Development
LWMP	Local Water Management Plan

List of Acronyms

MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health
MIDS	Minimum Impact Design Standards
MNDOT	Minnesota Department of Transportation
MPARS	Minnesota Permitting and Reporting System
MPCA	Minnesota Pollution Control Agency
MS4	Municipal Separate Storm Sewer System
MTDs	Manufactured Treatment Devices
NHIS	National Heritage Information System
NOAA	National Oceanic and Atmospheric Administration
NO3	Nitrate
NPDES	National Pollutant Discharge Elimination System
OHF	Outdoor Heritage Fund
PEP	Public Engagement Plan
Plan	2026-2035 Vermillion River Watershed Management Plan
SNA	Scientific and Natural Area
SSTS	Subsurface Sewage Treatment Systems
SSWCD	Scott Soil and Water Conservation District
TAC	Technical Advisory Committee
TALU	Tiered Aquatic Life Use
TMDL	Total Maximum Daily Load
TP	Total Phosphorus
TSS	Total Suspended Solids
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
WASCOB	Water and Sediment Control Basin
WBIF	Watershed Based Implementation Funding
WCA	Wetland Conservation Act
WLA	Waste Load Allocation
WMA	Wildlife Management Area
WRAPS	Watershed Restoration and Protection Strategies

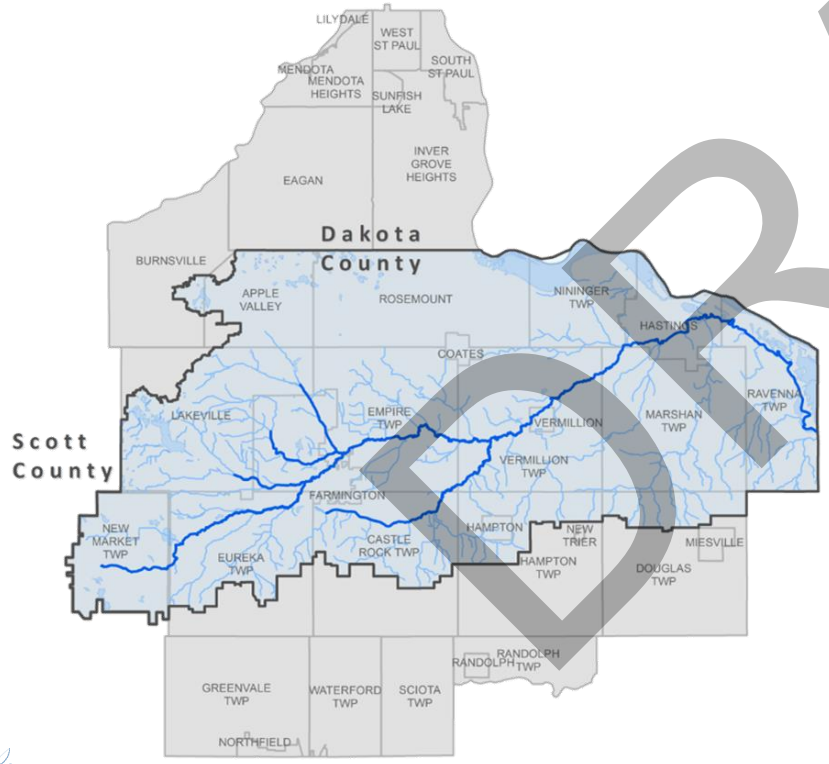
List of Acronyms

WOMP	Watershed Outlet Monitoring Program
WWTP	Wastewater Treatment Plant
VRMN	Vermillion River Monitoring Network
VRWJPO	Vermillion River Watershed Joint Powers Organization

Executive Summary

The Vermillion River Watershed is the largest watershed by land area in the Minneapolis-St. Paul seven-county metropolitan area. It is one of the state's 81 "major" watersheds (denoted by an 8-digit Hydrologic Unit Code [HUC]), which represent an area of the landscape that drains to a portion of a stream network. The Vermillion River Watershed drains 335 square miles in Dakota and Scott counties, with most of the watershed existing in central Dakota County. It is unique to the Twin Cities Metro Area in the fact that it includes 51.6 miles of Minnesota Department of Natural Resources-designated trout streams.

Figure E-1: Map of Land Area Governed by the VRWJPO



The Vermillion River Watershed Joint Powers Organization (VRWJPO) was formed in 2002 when Dakota and Scott counties signed a joint powers agreement (JPA) to manage the Vermillion River Watershed per authorities given by Minnesota Statutes 103B and Minnesota Rules 8410. The VRWJPO is governed by a three-member Joint Powers Board (JPB) consisting of two Dakota County Commissioners and one Scott County Commissioner.

The VRWJPO's mission is to:

> Collaboratively provide education, science and support to restore and protect the Vermillion River Watershed's natural resources for all who live, work and play within its boundaries.
>
> *VRWJPO Mission*

To achieve its mission, VRWJPO staff support and implement a range of programs, projects, practices, and capital improvements designed to protect, improve, and manage resources within its jurisdiction.

This third-generation, 2026-2035 Vermillion River Watershed Management Plan (Plan) includes the collective information and input of many stakeholders who care about the resources threaded throughout the watershed where they live, work, or play.

Appendix B summarizes the land and water resources located within the VRWJPO. It contains details relating to topography, soils, geology, groundwater resources, surface water resources, stormwater systems, climate and precipitation, natural

communities, endangered and invasive species, fish and wildlife habitat, water-based recreation areas, and land uses.

The information presented in Appendix B helps paint a picture of the ecological diversity observed within the VRWJPO, as well as the role the human-built environment imparts on the natural environment. In addition, it presents the condition of resources within its boundaries, helping to inform issues, and actions to address said issues.

Stakeholder Engagement

During the development process of this Plan, the VRWJPO created a Public Engagement Plan (PEP) to give stakeholders avenues to provide input on priority issues, per MN Rule 8410.0045.

Stakeholder groups included:

- Watershed residents
- Business and industries in the watershed
- Nonprofit, advocacy, and special interest groups
- Watershed cities and townships
- State and regional agencies

Outreach efforts included:

- Three in-person stakeholder events
- Two in-person pop-up events
- Six virtual stakeholder meetings
- Online and in-person surveys
- Display boards at four public libraries and two Dakota County parks

Themes of Stakeholder Response

Below are the topics that arose from the stakeholder engagement process as the greatest issues or concerns. These formed the foundation of the Plan and encompass focus areas for implementation over its 10-year cycle. Details of the full engagement process can be found in Appendix C.

Figure E-2: Meandering South Creek

Surface Water Quality

The Watershed is rich with surface water resources. Stakeholders feel a deep connection to these resources and the VRWJPO seeks to foster that relationship. Surface water quality efforts will be interwoven throughout many aspects of the Watershed's work.

Groundwater Quality

Emerging contaminants, winter operations, and pollutants from agricultural activities threaten the quality of groundwater in the Watershed. Everyone deserves access to clean drinking water. While other

Figure E-3: Dakota County Soil and Water Conservation District (DCSWCD) Monitoring Staff

agencies take the lead in groundwater planning and protection, the VRWJPO can foster partnerships that protect groundwater quality.

Figure E-4: Stormwater Improvements on North Creek

Stormwater Management

The Watershed is home to several communities that are experiencing significant residential, commercial, and industrial development. With development comes additional impervious surface and stormwater runoff. Stormwater runoff collects pollutants as it runs over the landscape and contributes the runoff and pollutants to waterbodies. The VRWJPO will foster implementation of practices to ease stormwater impacts throughout the life of the Plan.

Figure E-5: Brook Trout in the Vermillion River

Natural Environments

The Watershed is home to diverse natural environments unique to a major metropolitan area. However, these environments are threatened by competing land uses and invasive species. This Plan will prioritize the protection, enhancement and restoration of natural ecosystems.

Figure E-6: Stormwater Improvements on a Tributary to South Creek

Climate Resilience

Precipitation patterns have become more extreme, favoring intense storm events that produce excessive runoff and decrease natural infiltration. In addition, the Watershed has been subject to periods of drought and more extreme temperature fluctuations in recent years. These patterns negatively impact the VRWJPO's natural and built environments. While the VRWJPO does not have a role in addressing greenhouse gas issues, this Plan will define the VRWJPO's role in climate adaptation relating to water resources.

Figure E-7: Educational Signage on a Stormwater Reuse System

Groundwater Supply

Groundwater is the primary source of drinking water for Watershed communities, through municipal water supplies and private wells. This same water is used for crop production, industries, and other residential needs. At the onset of the Plan update process, the Watershed experienced a three-year historic drought, highlighting the need to balance groundwater supply with community needs.

Figure E-8: VRWJPO Staff Showcasing an Adopt-A-Drain Display

Community Relationships

Stakeholders within the VRWJPO can implement practices in their daily lives that improve the Watershed as a whole; however, there is room for growth in community engagement. Engaging stakeholders on stewardship opportunities, environmental issues, and the purpose and outcomes of the VRWJPO will be a focus of this Plan.

Plan Structure

After the robust public engagement process, VRWJPO staff sought direction from the Community Advisory Committee (CAC), Technical Advisory Committee (TAC), and JPB to assess priority issues for the Plan based on stakeholder input. Staff married this direction with other local plans, pertinent studies, resource monitoring and assessment data, and understanding of the VRWJPO's role in water governance to formulate Plan issue statements and goals. A list of references can be found in Appendix A.

Issues and Goals

The Plan is organized into six issue categories, each with issue statements and goals informed by stakeholder input. Each category has a unique color and icon throughout the Plan:

1. Water Quality

Water Quality Issue Statements

- Surface water quality is threatened or impaired.
- Groundwater quality is threatened or impaired.

Water Quality Goals

- Protect and improve surface water quality.
- Protect and improve groundwater quality.

2. Stormwater Management

Stormwater Management Issue Statements

- Land alterations and lack of adequate stormwater management in the Watershed have increased the rate and volume of stormwater runoff, impacted water quality, degraded habitat, and increased flood risk.
- Watershed regulations are challenging for some local government units to enforce.

Stormwater Management Goals

- Reduce runoff rate and volume.

- Develop and implement practicable and protective Watershed Rules and Standards.

3. Groundwater Supply

Groundwater Supply Issue Statements

- Groundwater aquifer supply is threatened due to increased and competing uses.
- Groundwater recharge rates are decreasing due to landscape alterations and climatic fluctuations.

Groundwater Supply Goal

- Protect and improve groundwater aquifer supply.

4. Climate Resilience

Climate Resilience Issue Statements

- Climatic patterns are negatively impacting the Watershed's natural and built environments.
- Historic stormwater infrastructure is not adequate to manage climate patterns.

Climate Resilience Goals

- Improve the resilience of the Watershed's natural and built environment.
- Adapt stormwater infrastructure to changing precipitation patterns.

5. Natural Environments

Natural Environments Issue Statement

- Human-caused ecosystem disruptions decrease biological diversity, promote the proliferation of invasive species, and have wide-reaching impacts to the Watershed's natural environment.

Natural Environments Goals

- Mitigate impacts from human-caused ecosystem disruptions.
- Protect and enhance natural environments.

6. Community Relationships

Community Relationships Issue Statements

- Public awareness and understanding of the Watershed is limited.
- Community members in the Watershed lack awareness of opportunities to engage in the VRWJPO's work.

Community Relationships Goals

- Improve the awareness and understanding of the VRWJPO.
- Increase community connection to the Watershed's natural resources.
- Increase community understanding of environmental issues.

Implementation Plan

Watershed implementation actions are detailed in Section Three. Estimated costs, year(s) of implementation, priority level and relationship to Plan objectives are presented associated with each action within the Implementation Plan (*Tables 3-14 and 3-15*).

The Implementation Plan was developed to encompass critical ongoing actions, as well as newly developed actions to address emerging issues and changing priorities. Notable actions of highest priority include those identified in *Table E-1*.

Table E-1: Priority Actions within the Implementation Plan

Category	Item ID	Action Description
Water Quality	WQ-1	Annually administer the Vermillion River Monitoring Network (VRMN) including physical, chemical, and biological monitoring.
	WQ-2	Fund additional subwatershed, geomorphic and other assessments to identify water quality improvement projects and practices.
	WQ-3	Implement projects such as: infiltration, filtration, ponding, reuse, hydrodynamic separators and Manufactured Treatment Devices (MTDs) identified within the City of Lakeville North Creek and East Lake Subwatershed Assessment.
	WQ-4	Implement projects such as: infiltration, diversion, reuse and alum identified within City of Apple Valley East Lake Subwatershed Assessment.
	WQ-5	Implement projects such as: filter strips, grassed waterways, Water and Sediment Control Basins (WASCOBs), wetland restorations and native grasses identified within Vermillion River Headwaters Subwatershed Assessment.
	WQ-6	Implement projects such as: filter strips, grassed waterways, WASCOBs, streambank and shoreline stabilizations identified within Upper Mainstem Subwatershed Assessment.
	WQ-7	Implement projects such as: grassed waterways, WASCOBs, critical area planting, filter strip, grade stabilization, streambank stabilizations and wetland restorations identified within South Branch Vermillion River Subwatershed Assessment.

Table E-1 Continued: Priority Actions within the Implementation Plan

Category	Item ID	Action Description
Water Quality	WQ-8	Implement projects such as: WASCOBs and grassed waterways identified within Vermillion River Lower Mainstem South Subwatershed Assessment.
	WQ-9	Implement projects and practices to address East Lake's Waste Load Allocation (WLA) defined within the Vermillion River Watershed Total Maximum Daily Load (TMDL).
Stormwater Management	SW-1	Implement projects such as: infiltration, filtration and hydrodynamic separators identified within Hastings Direct Drainage Subwatershed Assessment.
	SW-2	Implement projects such as: infiltration, filtration, pervious paver, boulevard tree trench, cistern, wetland and stream revitalization, and MTDs identified within the South Creek Subwatershed Assessment.
	SW-3	Implement projects such as: treatment train, underground vault/pipe gallery and biofiltration projects identified within City of Farmington Subwatershed Assessment.
	SW-4	Implement projects such as: bioretention basin, retention pond, impervious reduction and stormwater reuse identified within City of Farmington Stormwater Retrofit Assessment for Independent School District 192.
	SW-5	Implement innovative Stormwater Management projects and practices such as: green infrastructure, stormwater reuse and Low Impact Development (LID) Best Management Practices (BMPs).

Table E-1 Continued: Priority Actions within the Implementation Plan

Category	Item ID	Action Description
Groundwater Sustainability	GS-1	Collaborate with partners for local, regional and state groundwater conservation assessments.
	GS-2	Implement projects, programs and practices identified within the Dakota County Groundwater Plan such as: a VRWJPO-wide water supply/conservation initiative, cost-sharing for water conservation projects, working with the DNR to ensure large groundwater appropriation requests are sustainable, and more.
Climate Resilience	CR-1	Partner in the development of a Climate Resiliency Plan to include, but not be limited to: inventory of inadequate stormwater infrastructure, feasibility of stormwater pond smart technology, flood risk assessments and natural resource susceptibilities to drought.
	CR-2	Provide incentives for projects identified within the Climate Resiliency Plan.
	CR-3	Implement restoration and enhancement projects that connect water resources to the historic floodplain.

Table E-1 Continued: Priority Actions within the Implementation Plan

Category	Item ID	Action Description
Natural Environments	NE-1	Implement projects such as: natural channel restoration/relocation, grade control, floodplain management, riparian management, bank stabilization and culvert crossing projects identified within the South Creek Geomorphic Assessment.
	NE-2	Implement projects such as: natural channel restoration/relocation, grade control, floodplain management, riparian management, bank stabilization and culvert crossing projects identified within the Ravenna Coulee Geomorphic Assessment.
	NE-3	Implement projects such as: bank stabilization, floodplain management, grade control, natural channel restoration and riparian management projects identified within the Middle and North Creek Geomorphic Assessment.
	NE-4	Implement projects such as: bank stabilization, culvert crossing, natural channel restoration, infrastructure and riparian management projects identified within the Empire Drainages Geomorphic Assessment.
	NE-5	Implement projects such as: bank stabilization, riparian management and infrastructure improvement projects identified within the Lower Mainstem Geomorphic Assessment.
	NE-6	Restore priority wetlands and administer the VRWJPO Wetland Banking Program to achieve a no-net-loss of wetlands within the watershed.
	NE-7	Restore areas identified within Priority Wetland Restoration studies, not just for the purpose of the creation of a wetland bank.
	NE-8	Implement projects and practices to address East Lake's Load Allocation (LA) defined within the Vermillion River Watershed TMDL.

Table E-1 Continued: Priority Actions within the Implementation Plan

Category	Item ID	Action Description
Community Relationships	CMR-1	Provide Stewardship Grants to individuals and groups in the watershed who are looking to install BMPs with direct water resource benefits.
	CMR-2	Host display tables at community events where attendees are likely to be interested in environmental topics.
	CMR-3	Keep the VRWJPO website up to date by regularly reviewing and posting pertinent content.
	CMR-4	Electronically distribute VRWJPO newsletter with watershed updates, news, and tips.
	CMR-5	Annually plan, promote and provide financial incentives for partner programs that align with the goals and objectives of this Plan.
	CMR-6	Engage stakeholders and the public through insightful social media posts.

Evaluating Success

Each year, the Watershed submits an annual activity report to the Minnesota Board of Water and Soil Resources (BWSR) in accordance with MN Rule 8410.0150. Items within the submitted report include, but are not limited to:

- Descriptions of activities completed relating to the previous year's annual work plan, organized according to the VRWJPO's seven general budget categories (Administration and Operations; Regulation; Planning; Inventory, Assessment and Research; Feasibility/Preliminary Engineering; Capital Improvement Program and Maintenance; and Communication, Outreach and Public Relations) as well as special projects
- Expenditures relating to the VRWJPO's general budget categories as well as special projects, including a Final Treasurer's Report
- Monitoring data related to water quantity, water quality, temperature and biological monitoring, including annual data as well as relation to long-term averages
- A budgeted work plan and activities for the year following reporting

In prior reporting years, the VRWJPO would submit a measurable outcomes evaluation of progress made towards goals and implementation actions within the 2016-2025, including items that are a part of the capital improvement program, every two years. Beginning in 2024, staff began folding measurable outcomes data into the annually submitted report. If, during the evaluation process, it is found that the Plan should be modified to continue planned progress towards goals and actions, VRWJPO staff follow the amendment process described in Section 1.4.

Local Government Unit Plan Implementation

Following adoption of the Plan by the JPB, Local Government Units (LGUs) having land use planning and regulatory authority for territory within the VRWJPO must prepare a local water management plan (LWMP), capital improvement program, and official controls to ensure local water management is consistent with the VRWJPO Plan. Content must follow guidelines described in MN Statute 103B.235 and MN Rule 8410.0160. The following timelines apply:

- Each LGU must submit its LWMP to the VRWJPO to review for consistency with the VRWJPO Plan. The VRWJPO must respond within **60 days** of submittal.
- LGUs within Dakota County must submit their LWMPs to Dakota County to ensure consistency with the 2020-2030 Dakota County Groundwater Plan. Dakota County must complete its review within **45 days**.
- Each LGU must submit its LWMP to the Metropolitan Council to ensure consistency with its comprehensive development guide. Met Council must complete its review within **45 days**, concurrently running with the 60-day VRWJPO review period.
- Following approval of an LGU's respective LWMP, said LGU must adopt their LWMP within **120 days**.
- In addition, any amendments to official controls required to maintain consistency with the VRWJPO Plan must be completed within **180 days**.
- Following VRWJPO, Dakota County and Metropolitan Council review, LGUs must ensure LWMPs are consistent with the Watershed Plan are adopted within **2 years** of Plan adoption.

Section One: Introduction

The Vermillion River Watershed 2026-2035 Management Plan establishes the priorities and framework for managing water resources within the Watershed over the next ten years. The Plan will be implemented via VRWJPO staff at the discretion of the JPB.

1.1 Watershed History and Organization

The Metropolitan Surface Water Management Act (Minnesota Statute 103B) establishes the purposes of watershed management organizations as to:

- Protect, preserve, and use natural surface and groundwater storage and retention systems.
- Minimize public capital expenditures needed to correct flooding and water-quality problems.
- Identify and plan for means to effectively protect and improve surface and groundwater quality.
- Establish more uniform local policies and official controls for surface and groundwater management.
- Prevent erosion of soil into surface water systems.
- Promote groundwater recharge.
- Protect and enhance fish and wildlife habitat and water recreational facilities.
- Secure the other benefits associated with the proper management of surface and groundwater.

In 1984, the cities and townships within the Vermillion River Watershed entered a JPA to manage water resources within the watershed. This organization was unable to cooperatively fulfill the conditions of the Metropolitan Surface Water Management Act and dissolved in August 2000.

Following the dissolution of the first watershed management organization, Dakota and Scott counties became statutorily responsible for managing the Vermillion River Watershed. In 2002, the counties entered a new JPA to create the VRWJPO as it operates today. The VRWJPO is governed by the three-member JPB, composed of two Dakota County Commissioners and one Scott County Commissioner. The JPA underwent minor updates in 2024 to modernize language and meeting formats. The revised JPA was approved by the two County Boards in early 2025.

In accordance with Minnesota Rule 8410.0045, the JPA established a nine-member CAC for the purpose of making recommendations to the JPB on the Plan. In addition, the JPB established a TAC consisting of cities, state agencies, and other interested groups to provide technical consultation.

The first-generation Vermillion River Watershed Management Plan was adopted in 2005. The second-generation Plan was adopted in 2016, later being amended in 2022 following completion of the Vermillion River Watershed Restoration and Protection Strategy (WRAPS) document. Since the adoption of the previous generation plan, some changes have been observed across the watershed, including, but not limited to:

- Continued development and population growth
- Increased storm intensity as reflected in the National Oceanic and Atmospheric Administration (NOAA) Atlas 14, with the NOAA currently developing Atlas 15 to constitute the new authoritative, spatially continuous National Precipitation Frequency Atlas of the United States
- Moderate to severe drought conditions in 2022, 2023, and 2024.
- Changes in national, state, and local regulations affecting water management

- Key scientific research that changed understanding of water resources
- Innovative technology developments
- The Watershed receiving biennial Watershed Based Implementation Funding (WBIF) to accelerate water management outcomes
- Emerging and worsening pollutants of concern
- An increase in water usage from high volume users (e.g. industrial, agricultural, municipal)

Development of this third-generation Plan has incorporated these observed changes, considering their role within the scope of priority issues identification.

1.2 Watershed Mission

The mission of the VRWJPO is to collaboratively provide education, science, and support to restore and protect the Vermillion River Watershed's natural resources for all who live, work, and play within its boundaries. Watershed staff and stakeholders operate according to the idea that watershed management should be based on inclusive public engagement, targeted priorities, beneficial outcomes, and sound scientific data. These principles form the foundation of all work in the Watershed.

1.3 Plan Development Process and Stakeholder Engagement

Development of the third-generation Plan took place in accordance with Minnesota Rules 8410.0045, 8410.0080 and 8410.0105. This included:

- Authorization from the JPB to begin the Plan update process
- A 60-day comment period for plan review agencies identified in MN Statute 103B.231 and key stakeholders to provide input on priority issues, water management goals, and water resource information before beginning further Plan development
- Hosting an initial planning meeting following the 60-day comment period complying with open meeting law
- Engaging stakeholders, the CAC, the TAC, and the JPB in assessing and identifying priority issues virtually, in public meetings and at community events
- Identifying and considering all relevant plans, programs, monitoring data, studies, VRWJPO roles and funding levels for establishment of priority issues
- Ensuring measurable goals address priority issues and allow for annual quantification of progress made towards actions in the Plan
- Requesting CAC, TAC, and JPB prioritization of objectives meant to address priority issues identified within the Plan
- Requesting CAC, TAC, and JPB prioritization of topics of importance meant to inform creation of implementation plan actions and schedule
- Meeting with VRWJPO LGUs to discuss 10-year Capital Improvement Program (CIP) plans and potential partnerships

- Establishing prioritized implementation actions that align with public and stakeholder input
- Ensuring clear illustration of VRWJPO project and program funding relating to implementation actions, LGU partnerships, annual levy projections, and staff capacity
- Performing a 60-day review and comment period for the draft plan for Dakota and Scott counties, Met Council, state review agencies, and all cities and townships within the VRWJPO
- Hosting a public hearing on the draft plan no sooner than 14 days after the 60-day review period (previously described)
- Responding in writing to all comments received by review agencies at least 10 days before the public hearing

Before the stakeholder engagement process, VRWJPO staff developed a PEP to guide timely, relevant, and candid feedback on stakeholder issues, concerns and potential strategies to be included in the Plan. A consulting firm worked closely with VRWJPO staff to develop, facilitate, organize, and summarize the public engagement process. *Details relating to the full engagement process and findings can be found in Appendix C.*

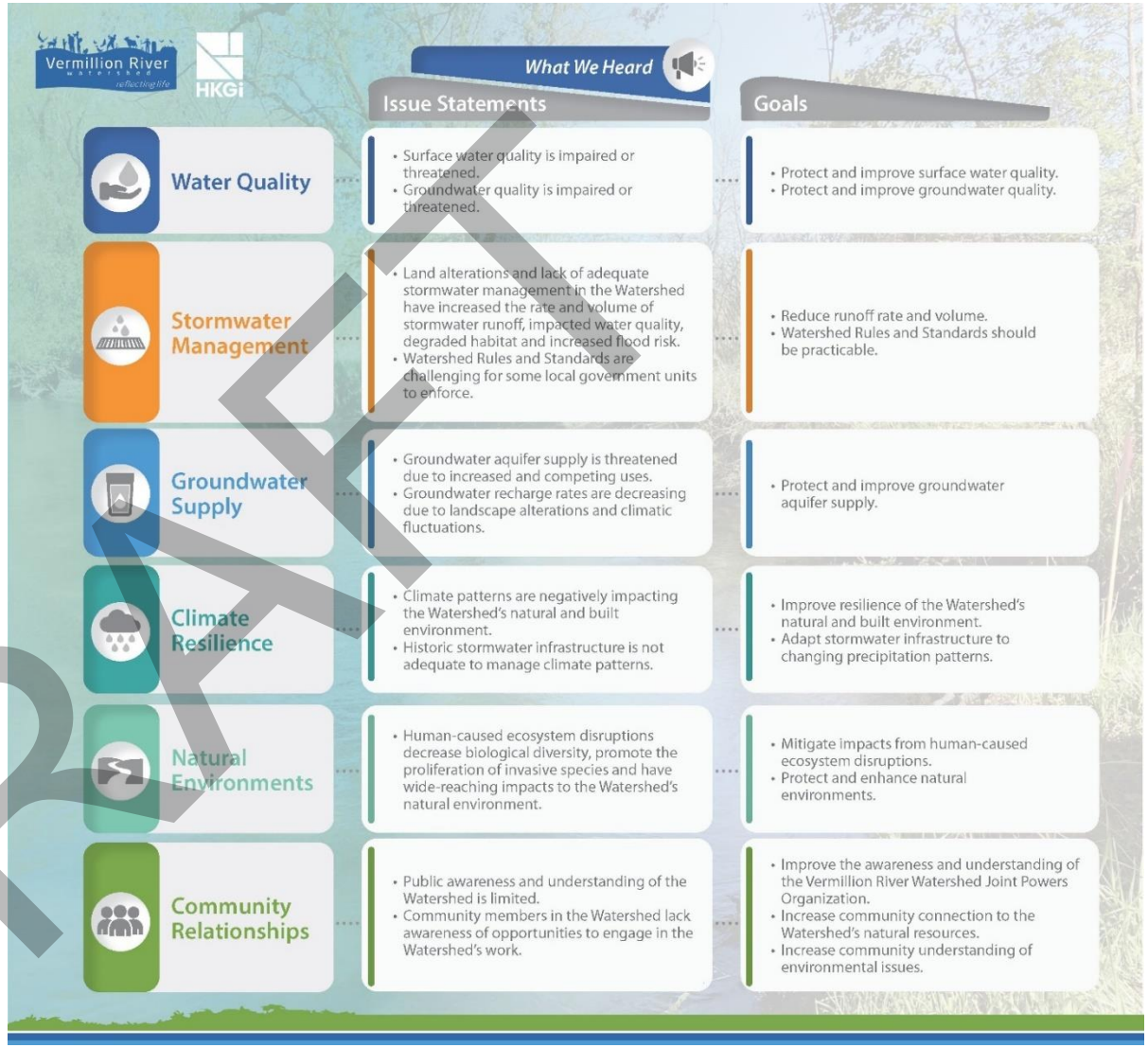


Figure 1-1: Issue Statements and Goals Developed Following Engagement

Along with the PEP, VRWJPO staff worked to join engagement input with watershed assessment data, local, regional, and state plans and programs; and staff understanding of the Watershed's capacity and roles, along with the priorities of the CAC, TAC, and JPB.

For ease of use, staff found the below Plan structure to be the most navigable in terms of implementation and measurable outcomes:

- **Watershed Mission** – Guides all aspects of the Plan.
- **Issues** – Derived from feedback collected during the stakeholder and public engagement process, these present areas of focus that will be addressed in the goals and implementation sections of the Plan. Issue statements developed by staff act to summate all items a Plan user can expect to see within the respective category, allowing categorization of initiatives in a meaningful and representative way.
- **Goals** – Measurable goals correspond with each issue category. Goals are consistent with the purposes of the Metropolitan Water Management Program described in Minnesota Statute 103B.201. These goals provide direction towards addressing the VRWJPO's issues and allow for quantification of progress over the life of the Plan.
- **Objectives** – Objectives help catalog activities required to achieve goals.
- **Topics of Importance** – Topics of importance relate to each issue category to guide prioritization of action items included in the implementation plan.
- **Actions** – Prioritized implementation actions are the finest scale items within the Plan, speaking to specific projects, programs, and practices and their corresponding

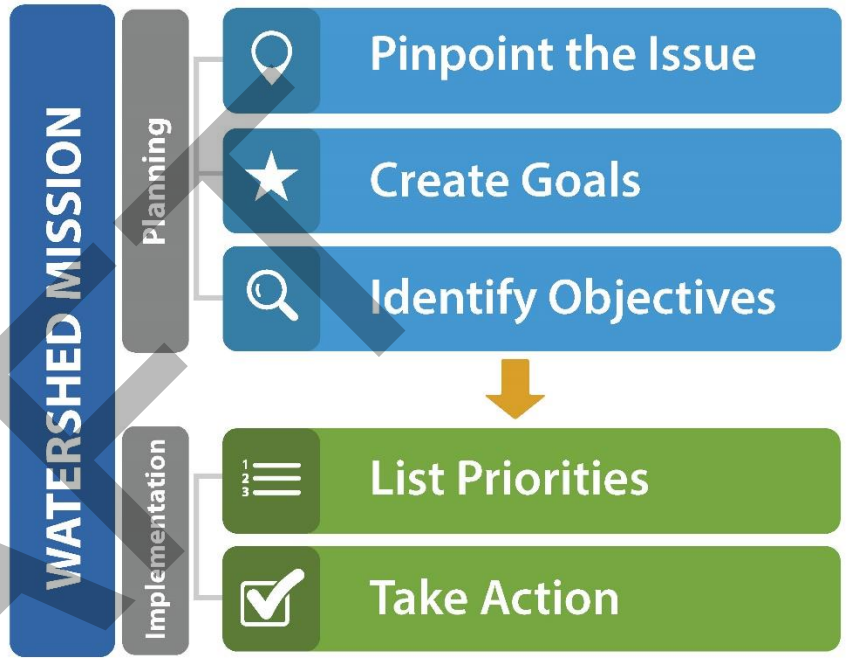


Figure 1-2: Overview of Plan Structure

geographic location. While the Plan presents actions organized according to issue categories, development of actions followed the directives of Minnesota Rule 8410.0105. This includes assurance of actions that fit within: capital improvement programs, operation and maintenance programs, information and education programs, data collection programs, regulatory programs, incentive programs, and water restoration and protection programs.

1.4 Amendments to the Plan

This third-generation Watershed Management Plan guides the VRWJPO's work through 2035. While the Plan was developed using the collective vision of VRWJPO staff, the JPB, the CAC, the TAC, and stakeholders, changes during the life of the Plan may result in the need to perform amendments. The following changes can be made to the Plan without the requirement of an official amendment:

- Formatting or reorganization of the Plan
- Revision of a procedure meant to streamline administration of the Plan
- Clarification of existing Plan goals or policies
- Inclusion of additional data not requiring interpretation
- Expansion of public process
- Adjustments to how an organization will carry out program activities within its discretion

All other changes to the Plan will require a Plan amendment in accordance with MN Rule 8410.0140. The process for amending the Plan will follow MN Statute 103B.231.

1.5 Consistency with Local Water Management Plans

In accordance with MN Statute 103B.235, following approval and adoption or amendment of the Plan, LGUs having land use planning and regulatory responsibility for territory within the VRWJPO shall prepare a local water management plan LWMP, capital improvement program, and official controls as necessary to bring local water management into conformance with the Plan. This includes the requirement by each LGU within Dakota and Scott Counties to determine by resolution whether to prepare a LWMP or to delegate all or part of the preparation of the LWMP to the county. Local governments shall follow all review, adoption, and amendment proceedings as prescribed by statute.

Each local plan, in the degree of detail required in the watershed Plan, shall:

- Describe existing and proposed physical environment and land use
- Define drainage areas and the volumes, rates, and paths of stormwater runoff
- Identify areas and elevations for stormwater storage adequate to meet performance standards established in the watershed Plan
- Identify regulated areas
- Set forth an implementation program, including a description of official controls and, as appropriate, a capital improvement program

Prior to local adoption, each LGU must submit its LWMP to the VRWJPO for review to ensure consistency with the Plan pursuant to MN Statute 103B.231. The VRWJPO will provide its response within 60 days of submittal. In addition, if an LGU is within Dakota County, the LGU must submit its LWMP to Dakota County to ensure consistency with the 2020-2030 Dakota County Groundwater Plan. Dakota County will be granted 45 days to complete its review. Should either the VRWJPO or Dakota County fail to complete its review within the prescribed period, the LWMP will be deemed approved unless an extension is agreed to by the LGU.

Concurrently with its submission of its local water management plan to the VRWJPO, each LGU must submit its LWMP to the Met Council for review and comment. Met Council will have 45 days to review and comment on the local plan with respect to consistency

with the council's comprehensive development guide for the metropolitan area. Met Council's 45-day review period will run concurrently with the 60-day VRWJPO review period.

Following approval of the LWMP by the VRWJPO, LGUs must adopt their respective LWMP within 120 days. In addition, any amendments to official controls required to maintain consistency with the Watershed Plan must be completed within 180 days.

Section Two: Issues, Goals, Objectives, and Topics of Importance

2.1 Identification of Issue Categories

As detailed within Appendix C, the VRWJPO and its consultant executed a PEP in 2023-2024 to develop, organize, facilitate, and summarize an engagement process to inform the Plan revision. The PEP guided the public engagement process through effective and inclusive engagement methods for a diverse range of stakeholder groups to motivate and involve the VRWJPO's traditional stakeholders and those stakeholders who may not normally engage. *Highlights of engagement events associated with execution of the PEP are shown in Figure 2-1*.

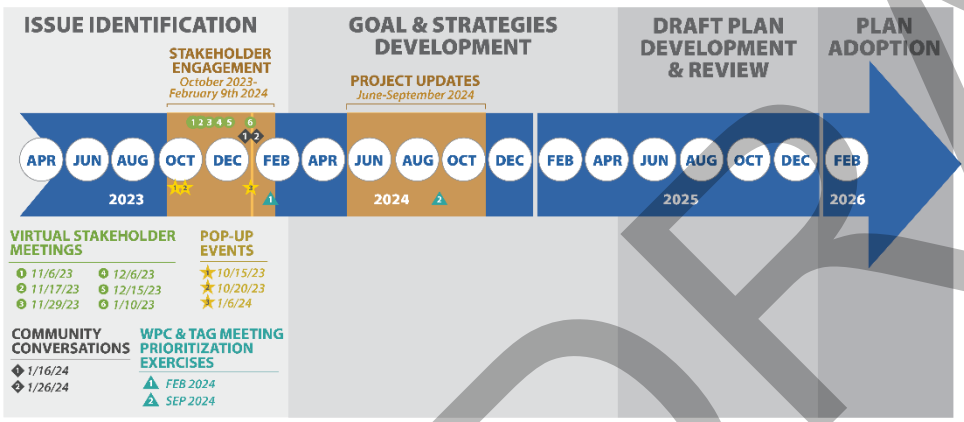


Figure 2-1: Overview of Public and Stakeholder Engagement Process

In addition to public engagement, VRWJPO staff regularly solicited feedback from the VRWJPO's CAC (*formerly known as the Watershed Planning Commission, or WPC as seen in Figure 2-1*), TAC (*formerly known as the Technical Advisory Group, or TAG as seen in Figure 2-1*), and other legally required review agencies.

On April 3, 2023, the VRWJPO notified all review agencies identified in MN Rule 8410.0045 of their initiation of the Plan update process, requesting feedback related to each review agency's priority issues, water management goals, and water resource information. The notification and request were also sent to counties, cities, and townships within the VRWJPO, requesting feedback on official controls and programs, priority issues, water management goals, and water resource information. All organizations were allowed 60 days to provide feedback.

Public engagement consisted of virtual meetings, community conversations (open-house meetings), and pop-up events. Nearly 320 people participated in the issue identification phase of the Plan update through this process. *Details relating to feedback collected during the engagement process, including lists of entities engaged, stakeholder written responses, survey results, and prioritization exercises can be found in Appendix C.*

Using the information collected from 2023 and early 2024 public engagement, staff developed issue categories to organize stakeholder-identified issues. The Plan draws on found priorities gathered through the public engagement process to lump activities into six major issue categories, as shown on the following the page. The issue categories presented are not listed according to priority. Prioritization will be further described in Section 3.2.

1. Water Quality

2. Stormwater Management

3. Groundwater Supply

4. Climate Resilience

5. Natural Environments

6. Community Relationships

2.2 Goals, Objectives, and Topics of Importance

As previously detailed in Section 1.3, the Plan is organized according to Issues, Goals, Objectives, and Actions. The various stakeholder-identified issues are organized into Issue Categories. Priority Issue Statements clarify the specific issues identified by stakeholders, informing goals, objectives, and actions found within the implementation plan.

Topics of importance are also included, related to each issue category. During the Plan prioritization process, it became clear that prioritizing items at the objective level would allow for enough detail to give clear direction on Watershed initiatives over the Plan's lifespan; however, topics of importance relating to issue categories would also be needed to help staff formulate activity-specific prioritization. *For detailed information relating to the VRWJPO's surface and groundwater resources, water quality and quantity trends, public drainage systems, subwatershed and geomorphic assessments, monitoring programs and other information that aided in the formulation of goals, objectives, and topics of importance, please refer to the Land and Water Resources Inventory in Appendix B.*

The following sections present all six issue categories along with their associated issue statements, goals, objectives, and topics of importance.

2.3 Water Quality

Water quality has been a primary driver of work in the Watershed since the VRWJPO's inception. For this generation's Watershed Management Plan, water quality is to encompass both surface and groundwater sources.

Water quality can be impacted by either point sources or non-point sources of pollution. Point source pollution discharges to a receiving water at a specific point with a known source, whereas a non-point source pollutant cannot be traced to a singular location or source. Examples of point source pollution include failing septic systems or untreated industrial discharges. Non-point pollutant sources include stormwater or agricultural runoff.

Point and non-point sources of pollution can originate from all types of land uses. As the Watershed is diverse in terms of land use, there are a variety of pollutant sources the water quality issue category aims to address. The Watershed Plan approaches this issue holistically, including actions to: implement practices that protect and improve water quality, participate in and support water quality monitoring, and foster partnerships that result in protecting or improving water quality.

Water Quality Issue Statements

- Surface water quality is threatened or impaired
- Groundwater quality is threatened or impaired

Water Quality Goals

- Protect and improve surface water quality
- Protect and improve groundwater quality

Water Quality Objectives (With H = High Priority, M = Medium Priority, L = Low Priority)

- Remove surface waters from the impaired waters list - H
- Protect surface waters from impairments - H
- Use surface water quality monitoring data to inform restoration and protection decisions - H
- Support and implement projects, programs, and practices to protect or improve groundwater quality - M
- Coordinate with others to assess impacts to groundwater from the Vermillion River and its tributaries - M
- Assist and coordinate groundwater quality work with lead groundwater organizations - L

Water Quality Topics of Importance (With H = High Priority, M = Medium Priority, L = Low Priority)

- Projects that address nutrients (phosphorus, nitrate [NO3]) - H
- Projects that address total suspended solids/sediment - H
- Projects that address aquatic biota (temperature, dissolved oxygen) - M
- Projects that address chloride - M
- Projects that address toxics/metals/emerging concern contaminants/pesticides - M
- Projects that address bacteria - L
- Projects that address aquatic invasive species - L

2.4 Stormwater Management

Land alterations disrupt natural hydrology through the removal of natural vegetation, increasing the amount of impervious surface, draining the landscape for production, and overall lessening water's natural ability to infiltrate into the ground. When water is no longer able to infiltrate naturally, it is directed elsewhere as runoff.

Runoff collects pollutants in urban and rural environments as it runs across the landscape, eventually making its way, often untreated, into area water resources. Runoff volume also has implications for the natural and built environment, with streams and stormwater infrastructure subjected to higher flow rates and volumes than their natural or built capacities, resulting in degraded habitat, disconnected floodplains, and exacerbated erosion. Through development, historic wetlands have been filled or have become altered or diminished, removing natural flood attenuation features and increasing the likelihood of flooding in populated areas.

The Plan addresses management of stormwater through implementation actions that: promote conservation of features that naturally attenuate stormwater, expand on built practices that can improve stormwater quality and quantity, and capture and reuse stormwater where feasible.

Stormwater Management Issue Statements

- Land alterations and lack of adequate stormwater management in the Watershed have increased the rate and volume of stormwater runoff, impacted water quality, degraded habitat and increased flood risk
- VRWJPO Standards are challenging for some LGUs to enforce

Stormwater Management Goals

- Reduce runoff rate and volume
- Develop and implement practicable and protective VRWJPO Standards

Stormwater Management Objectives (With H = High Priority, M = Medium Priority, L = Low Priority)

- Promote and implement stormwater practices that manage the peak rate and volume of runoff from the landscape - H
- Promote and implement infiltration practices - H
- Promote protection of natural floodplain capacities. - M
- Assist in the development and implementation of policies and programs that promote green infrastructure and LID practices - M
- Collaborate with technical experts and local governments when updating, revising, or changing VRWJPO Standards - M
- Ensure VRWJPO Standards can be administered by local governments - L
- Assist local governments with navigating and understanding regulatory framework - L

Stormwater Management Topics of Importance (With H = High Priority, M = Medium Priority, L = Low Priority)

- Green infrastructure/LID BMPs: BMPs that act to reduce the amount of impervious surfaces including rain gardens, tree trenches, green roofs, landscaping islands - H

- **Infiltration** BMPs: BMPs that do not have underdrains, such as permeable pavement, sand filters, infiltration basins - **M**
- **Filtration** BMPs: BMPs that do have underdrains, such as pretreatment filtration devices, vegetated filter strips, sand filters - **M**
- Stormwater reuse projects - **M**
- More stringent stormwater management requirements for new development or redevelopment (discharge rate reduction, increase amounts of volume control and decrease floodplain alteration) – **L**
- Temporary storage sedimentation BMPs: BMPs that temporarily pond water and allow for sediment to settle from the water column, including wet ponds, stormwater wetlands and manufactured devices such as hydrodynamic separators - **L**

2.5 Groundwater Supply

Communities within the Watershed rely primarily on groundwater aquifers for drinking water, whether supplied via municipal or private wells. With Watershed community growth and changing climate patterns leading to more runoff or persistent and intense droughts, groundwater supplies are being impacted.

While the VRWJPO is not a governing body for groundwater supply, impacts to groundwater have implications for local communities and groundwater's interaction with surface water resources. For this reason, the Plan incorporates groundwater supply implementation actions that: assist with groundwater conservation initiatives and lean on the expertise of groundwater supply leading agencies.

Groundwater Supply Issue Statements

- Groundwater aquifer supply is threatened due to increased and competing uses
- Groundwater recharge rates are decreasing due to landscape alterations and climatic fluctuations

Groundwater Supply Goal

- Protect and improve groundwater aquifer supply

Groundwater Supply Objectives (With H = High Priority, M = Medium Priority, L = Low Priority)

- Assist with and coordinate groundwater supply planning, protection, and improvement efforts with lead groundwater organizations - H
- Assist with and implement projects, programs and practices that reduce landscape and agricultural water use - M
- Assist with and implement projects, programs and practices that promote infiltration - L

Groundwater Supply Topics of Importance (With H = High Priority, M = Medium Priority, L = Low Priority)

- Soil health initiatives (cover crops, compost amendments, residue and tillage management, contour buffer strips, critical area plantings) - H
- Agricultural irrigation efficiency improvements- H
- Residential, commercial, and industrial irrigation efficiency improvements- H
- Projects and practices that promote natural infiltration (low-input landscapes, bioretention, trees, green roofs, permeable pavement, bioswales, etc.) - M
- Indoor appliance efficiency improvements (toilets, dishwashers, washing machines) - L

2.6 Climate Resilience

Deviations from historic climate patterns have resulted in changes to the Watershed's precipitation and temperature trends. Precipitation frequency and intensity trends now result in increased risk of flooding, drought, and corresponding risk to vegetation and infrastructure. Variable temperature swings (high-highs and low-lows) likewise place strain on vegetation and infrastructure through increased freeze-thaw cycles and changing plant hardiness zones.

While the Watershed does not have a role in minimizing greenhouse gas reductions, water planning entities and local communities are tasked with fostering resilience on the built and natural landscapes. The Plan achieves this through implementation actions that: support engineering best practices for the built environment, improve historic infrastructure to account for climate deviations and promote resilience in the natural environment.

Climate Resilience Issue Statements

- Climatic patterns are negatively impacting the Watershed's natural and built environment
- Historic stormwater infrastructure is not adequate to manage climate patterns

Climate Resilience Goals

- Improve the resilience of the Watershed's natural and built environment
- Adapt stormwater infrastructure to changing precipitation patterns

Climate Resilience Objectives (With H = High Priority, M = Medium Priority, L = Low Priority)

- Foster partnerships to implement projects, programs and practices that improve stormwater infrastructure's resilience to climate impacts – H
- Foster partnerships to implement projects, programs, and practices to increase the amount of green infrastructure - M
- Support re-evaluation of Watershed floodplains using updated data - M
- Promote reconnection to historic floodplains - M
- Support LGUs in stormwater infrastructure adaptation - L

Climate Resilience Topics of Importance (With H = High Priority, M = Medium Priority, L = Low Priority)

- Storm sewer and hard infrastructure modifications or improvements (appropriate sizing of new infrastructure, adapting historic infrastructure to new climate patterns) – H
- Stormwater basin/retention ponds modifications or improvements (larger/deeper ponds and basins) – H
- Large or industrial scale water reuse - M
- Green infrastructure BMPs (bioretention, trees, small scale rain barrels/cisterns, green roofs, permeable pavement, bioswales, etc.) - M
- Stormwater pond smart technology (automated pumping in anticipation of runoff events) - L

2.7 Natural Environments

Four different eco subsections exist within the Watershed, as further described within the Land and Water Resources Inventory (Appendix B). These ecoregions include the Big Woods Subsection, the Rochester Plateau Subsection, the St. Paul Baldwin Plains and Moraines Subsection and the Bluff lands Subsection. Environmental conditions vary depending on landscape position within the Watershed, including water physical and chemical properties, biological diversity and soil and geologic properties. Development and agricultural production have resulted in changes to the Watershed's natural environment.

While ceasing development or agricultural production in the Watershed is infeasible, achieving Watershed change in an environmentally responsible manner is possible. The Plan supports this practice through implementation actions that: support native biodiversity, protect and improve local habitat, and minimize impacts to local ecosystems.

Natural Environments Issue Statement

- Human-caused ecosystem disruptions decrease biological diversity, promote the proliferation of invasive species, and have wide-reaching impacts to the Watershed's natural environment

Natural Environments Goals

- Mitigate impacts from human-caused ecosystem disruptions
- Protect and enhance natural environments

Natural Environments Objectives (With H = High Priority, M = Medium Priority, L = Low Priority)

- Identify and improve high-priority water resource environments found to be significantly impacted by humans - H
- Coordinate with others and implement projects, programs and practices that protect the VRWJPO's aquatic and riparian habitats - H
- Coordinate with others to implement projects, programs and practices that improve soil health - M
- Coordinate with others to implement projects, programs and practices that improve disturbed landscapes - L

Natural Environments Topics of Importance (With H = High Priority, M = Medium Priority, L = Low Priority)

- Wetland restoration - H
- Streambank/shoreline restoration - H
- In-stream habitat restoration - M
- Upland restoration - L
- In-lake restoration (aquatic plants, fisheries) - L

2.8 Community Relationships

Establishing and nurturing relationships with individuals and groups that live, work, and play within the Watershed is essential for Watershed success. Local communities provide opportunities for implementation of programs, projects, and practices, and act as a bridge between Watershed staff's technical expertise and those that interact regularly with local water resources.

Community relationships take many forms, from involvement with the Watershed's various volunteer opportunities to helping others understand complex environmental issues and Watershed operations. The Plan will foster the longevity of meaningful community relationships through implementation actions that: articulate the impact local communities have on local water resources and natural environments; promote the engagement of individuals and groups in implementation of environmental stewardship projects, programs, and practices; and increase the understanding of the Watershed's role in various environmental capacities.

Community Relationships Issue Statements

- Public awareness and understanding of the Watershed is limited
- Community members in the Watershed lack awareness of opportunities to engage in the VRWJPO's work

Community Relationships Goals

- Improve the awareness and understanding of the VRWJPO
- Increase community connection to the Watershed's natural resources
- Increase community understanding of environmental issues

Community Relationships Objectives (With H = High Priority, M = Medium Priority, L = Low Priority)

- Consistently communicate and promote the work of the VRWJPO with partners and stakeholders – H
- Create and support opportunities for stakeholder connection and engagement with the Watershed's natural resources – H
- Grow the number of VRWJPO stakeholders - M
- Engage citizens to promote sustainable stewardship of lakes and streams - M
- Communicate with stakeholders regarding the environmental issues that directly impact the VRWJPO - M
- Maintain or increase ways for stakeholders to provide relevant input to the VRWJPO - L

Community Relationships Topics of Importance (With H = High Priority, M = Medium Priority, L = Low Priority)

- Social media – H
- Community events – H
- Direct financial support for individuals' projects (e.g. Stewardship Grants, MN Water Stewards, Landscaping for Clean Water) – H
- VRWJPO-hosted events - M
- Marketing/media paid campaigns - L
- Volunteer programs - L
- Project interpretive signs- L

Section Three: Implementation Plan

3.1 Evaluation of 2016-2025 Implementation Activities

To initiate the development of 2026-2035 Implementation Plan, VRWJPO staff first had to catalog the progress made toward items included in the 2016-2025 Vermillion River Watershed Management Plan. This was accomplished by:

- Referencing annual Watershed Management Plan Measurable Outcomes Progress Reports, which highlighted narratives and data from various implementation activities organized according to Goal
- Reviewing the master Implementation Table progress tracking tool, which identified all 239 implementation activities and their annual status as Done, Future, or Ongoing.
- Performing a full-scale Action Audit of all 239 implementation activities, noting whether activities belonged in the 2026-2035 Plan based on: whether they had been implemented, if they had components that could continue to add value to VRWJPO success, or if they were more administrative functions that did not belong within the Plan.

The Action Audit found that during the previous generation Watershed Management Plan:

- Extensive physical, chemical, habitat, and biological monitoring were completed annually to support a robust monitoring database to inform watershed management activities.
- More than 133 total BMPs were implemented via partnerships with VRWJPO LGUs to reduce pollutant loading throughout the Watershed.
- 99% of the Watershed became compliant with the State Buffer Law.
- 52 native garden, 83 raingarden, and 4 shoreline restoration projects were installed in the VRWJPO as a part of the DCSWCD Landscaping for Clean Water program.
- More than 19 groundwater quality BMPs were implemented throughout the VRWJPO.
- Irrigation audits were conducted at 24 Homeowner Associations (HOAs) to support efficient irrigation practices; irrigation system improvements were cost-shared at 9 HOAs.
- 18.82 million gallons of groundwater per year were saved via implementation of stormwater harvest and reuse systems.
- 10 million gallons of groundwater per year were saved via implementation of a splash pad recirculation project.
- 15 stormwater retrofit projects were implemented.
- 62 projects were implemented to address erosion in the Watershed.
- Total phosphorus (TP) concentrations are decreasing in several VRWJPO lakes; as a result, transparency is increasing.
- Total Suspended Solids (TSS) concentrations, monitored as a part of the VRMN, are improving (trending downward) within the Upper Mainstem, South Creek, North Creek, South Branch, and Lower Mainstem subwatersheds.
- Citizens in the Watershed report high levels of trust in VRWJPO activities, according to a 2021 survey by the University of Minnesota Center for Changing Landscapes.

- Awareness of the VRWJPO's operations is increasing, with user interaction with the VRWJPO webpage increasing from 2,325 users in 2016 to over 8,600 in 2024.
- VRWJPO staff directly engaged over 16,875 community members through workshops, field days, volunteer events, community events, school events, town hall discussions, tours, panel discussions, and presentations.

Table 3-1 highlights pollutant load reductions achieved through implementation of BMPs during the previous generation WMP lifespan.

Table 3-1: Pollutant Reductions Achieved Through Implementation Actions Completed from 2016-2025

Subwatershed	TSS Reduction (tons/yr)	TP Reduction (lbs/yr)	NO3 Reduction (lbs/yr)	Volume Reduction (acre-ft/yr)
Upper Mainstem	531.38	486.97	926.4	6.01
South Creek	44.51	82.54	0.0*	29.2
North Creek	285.76	487.25	1,262.0	175.6
South Branch	912.32	450.72	13,925.0	0.0
Middle Creek	367.21	374.8	0.0*	9.54
Middle Main Stem	136.58	60.5	0.0*	0.0
Lower Main Stem	864.1	460.43	14.66	0.0
Mississippi Direct	1,160.67	627.48	5,852.0	0.0
Total Reductions	**4,302.53**	**3,030.69**	**21,980.06**	**220.35**

*Pollutant reductions were calculated based on project focus. Those cells denoted with "0" within the NO3 Reduction column do not mean that a reduction was not achieved; rather, that a reduction amount was not calculated as it was not the primary focus for projects.

3.2 Implementation Plan Structure

By performing the Action Audit described in Section 3.1, staff noted that the 2016-2025 Plan was structured to include items that related to day-to-day functions as implementation activities. To streamline Plan ease of use, implementation, and annual progress assessments, it was decided that the 2026-2035 Plan would be structured to include:

- Administrative items that were pertinent to the function of the VRWJPO as a whole, but did not delve into such fine detail so as to create an exorbitant amount of day-to-day activities
- Programs such as those involved with monitoring, assessment and research, communications and engagement, grants, facility/infrastructure management, and regulations
- Activities such as feasibility studies, modeling efforts, and planning and operational work
- CIP projects, including engineering/design and construction activities

Implementation activities are organized according to Issue Category. For each implementation activity related measurable outcomes, partners, and annual cost are identified.

3.3 Prioritization

While all items included within the Plan hold importance, staff and the JPB must have a method to prioritize items for implementation. Well-designed prioritization and execution results in:

- the implementation of projects and programs that provide the greatest VRWJPO benefit,

Figure 3-1: Visual Representation of Plan Development Process

- optimized use of State and local taxpayer resources,
- the ability to regularly evaluate and report on Plan successes,
- and optimized use of staffing resources.

In accordance with MN Rule 8410.0045, MN Rule 8410.0080 and MN Rule 8410.0105, the Plan must establish priority issues, goals and actions: utilizing input received during the public engagement process, while considering the VRWJPO's relationship with other relevant plans and programs, and by assessing available data and trends.

When assigning priority levels to aspects of the Plan, a decision had to be made whether priority should be assigned at the issue, goal, objective, or action level. This decision would have direct impacts for VRWJPO's annual budgeting, including the development of annual work plans and Capital Improvement Programs. Consensus was reached on assigning prioritization levels at the objective level. This was based on the concepts of prioritization at the issue level being too general and prioritization at the action level being too detailed.

While prioritization was performed at the objective level, staff also had to determine how various projects or activities would be prioritized. For example, staff had to determine for the water quality issue category whether projects that address nutrients would be prioritized higher or lower in relation to projects that address total suspended solids. For this reason, topics of importance were included within each issue category, enabling another means of prioritization.

As further described in Appendix C, the prioritization regime utilized input received during the public engagement process. During Phase I of the public engagement process, which took place in fall 2023, a survey (Survey 1) was administered which presented various questions that would help staff identify and shape priority issue categories. This survey was provided at all public outreach events, as well as available on the VRWJPO website. Questions included:

1. Do you feel the current mission adequately describes the focus of the VRWJPO?
2. What is your relationship with the watershed?
3. What do you care about when it comes to water?
4. What concerns need to be addressed?
5. Are there any goals that you think should be added or reworded?
6. What other watershed issues are concerning to you?
7. How should the VRWJPO approach solutions?
8. Do you see any new opportunities for collaboration and coordination?
9. What barriers and opportunities do you see to protect groundwater and surface water quality and quantity?

Most questions were multiple choice, steering respondents towards MN Rule and Statute requirements for Plan content and development of priority issues. Several questions also left space for additional feedback, in case respondents wished to elaborate.

After review of input received from Survey 1, in early winter of 2024, staff developed a second survey (Survey 2) to disseminate to the VRWJPO's advisory committees, the CAC and TAC. Survey 2 was created to assess how priorities identified by primarily public entities (as opposed to advisory committees and the JPB), could be tailored to align with the VRWJPO's roles and directives. Survey 2 detailed themes garnered during the input-gathering process, asking committee members to rank them according to whether they were:

1. Either "Essential for the function of the JPO," "Good for the JPO to do," or "Not within the JPO's scope of work," and
2. Considered High/Medium/Low priority.

Survey 2 provided staff a priority ranking for themes gathered from Survey 1. Results were presented to the JPB at a Strategic Planning Session on March 21, 2024. At this Strategic Planning Session, the JPB found the priority ranking to be in alignment with Board priorities, offering the following additional input:

1. Prioritization should be tailored to ensure actions provide the most positive Watershed impact.
2. Focus should be placed to facilitate the implementation of high-quality projects, rather than a high number of projects.
3. The Watershed Plan should ensure consistency with other planning documents.
4. Consideration should be given to adopting a prioritization regime that allows for flexibility.

The CAC and TAC convened again in September 2024 to further guide Plan prioritization. Before the meeting, members were provided a third survey (Survey 3), which listed the draft Plan objectives (organized according to their issue category, including issue statements and goals), and asked to choose their top ~50% and rank them according to priority. See example below:

Issue Category 1: Water Quality

The VRWJPO has identified the following Objectives that will advance our Implementation Plan for Water Quality. **Please choose your top three Objectives and rank them in order of priority**:

- Remove surface waters from the impaired waters list.
- Protect surface waters from impairments.
- Use surface water quality monitoring data to inform restoration and protection decisions.
- Assist and coordinate groundwater quality work with lead groundwater organizations.
- Support and implement projects, programs, and practices to protect or improve groundwater quality.
- Coordinate with others to assess impacts to groundwater from the Vermillion River and its tributaries.

Embedded within Survey 3 was a Subprioritization Exercise, which asked CAC and TAC members to rank topics of importance relating to each issue category. An example of items included in this part of the joint CAC-TAC survey can be seen below:

Issue Category 1: Water Quality

- Projects that address nutrients (phosphorus, nitrate)
- Projects that address total suspended solids/sediment
- Projects that address aquatic biota (temperature, dissolved oxygen)
- Projects that address chloride
- Projects that address toxics/metals/emerging concern contaminants/pesticides
- Projects that address bacteria
- Projects that address aquatic invasive species

Results from Survey 3 are also described in detail in Appendix C. During the joint CAC-TAC meeting, members provided their priority rankings using a polling platform called Mentimeter, which were displayed in real-time, facilitating additional stakeholder discussion. Mentimeter uses a ranked-choice system called a "borda count" to assign priority. It works to assign priority points based on an item getting ranked as first place (then receiving three points), second place (then receiving two points) and last place (then receiving one point) by each participant.

The above point-based election system selected the highest priority objectives and topics of importance based on which options received the most points. To ensure that survey results comprehensively communicated the desires of member rankings, additional statistical analyses were performed on the results, focusing on assigning weighted scoring and calculating the average weighted scoring. Staff assessed the borda count,

weighted scoring, and average weighted scoring priority rankings, paired them with their technical expertise and understanding of VRWJPO roles, and drafted a priority ranking matrix for objectives and topics of importance.

The draft priority ranking matrix was then presented to the JPB at the December 5, 2024, JPB meeting. At this time, staff requested JPB input on whether Board members' prioritization was in alignment with - or deviated from - the presented matrix. Feedback was logged, creating the final matrix that compared:

- CAC and TAC member input ranked using the borda count method
- Staff recommendations on priority ranking after performing additional statistical analyses on raw CAC and TAC input
- Overall JPB recommendations

At the December Board meeting, the JPB concurred with the presented prioritization matrix. Surveys 1, 2 and 3, as well as the priority ranking matrix presented to the JPB, can all be found in Appendix C.

Before, during, and after gathering prioritization input from stakeholders and the Watershed's CAC, TAC, and JPB, staff reviewed the following to help further inform prioritization:

- Annual physical and chemical water quality monitoring data
- Annual fish, macroinvertebrate and habitat monitoring data
- Subwatershed and geomorphic assessments
- Watershed feasibility studies
- Local, regional, and state plans and studies

A comprehensive list of data, trends and plans reviewed can be found in Appendix A.

Data and trends defined within the Land and Water Resources Inventory (Appendix B), were also used to establish priority issues including:

- Topographic, geologic and soil characteristics
- Precipitation trends and their impacts on flood levels and water quantity discharges
- Water quality and quantity monitoring trends (including pollutant loading utilizing monitoring data)
- Groundwater sensitivities and supplies, including groundwater and surface water connections
- Stormwater systems, drainage systems, and control structures
- Regulated pollutant sources and permitted wastewater discharges
- Fish and wildlife habitat and rare and endangered species
- Water-based recreation areas
- Existing land uses and proposed development in local municipal comprehensive plans
- Priority areas for wetland preservation, enhancement, restoration, and establishment

Staff integrated prioritization engagement input and the items listed above with watershed capacity and implementation roles to define the final prioritization regime. This led to the method of prioritizing items according to high, medium, and low priority rankings. The Plan Implementation Table has been organized to graphically display objectives and actions according to this ranking.

Issue categories and their priority-level groupings are presented on the following pages. Priorities are presented for both objectives and topics of importance. Actions outlined within the Implementation Table in Section 3.3 follow the priority ranking shown on the following pages.

High Priority
Medium Priority
Low Priority

Table 3-2: Prioritized Water Quality Objectives

High Priority	Protect surface waters from impairments	Use surface water quality monitoring data to inform restoration and protection decisions	Remove surface waters from the impaired waters list
Medium Priority	Support and implement projects, programs and practices to protect or improve groundwater quality	Coordinate with others to assess impacts to groundwater from the Vermillion River and its tributaries	
Low Priority	Assist and coordinate groundwater quality work with lead groundwater organizations		

Table 3-3: Prioritized Water Quality Topics of Importance

High Priority	Projects that address nutrients (phosphorus, nitrate)	Projects that address total suspended solids/sediment	
Medium Priority	Projects that address aquatic biota (temperature, dissolved oxygen)	Projects that address toxics/metals/emerging concern contaminants/pesticides	Projects that address chloride
Low Priority	Projects that address aquatic invasive species (AIS)	Projects that address bacteria	

Table 3-4: Prioritized Stormwater Management Objectives

High Priority	Promote and implement stormwater practices that manage the peak rate and volume of runoff from the landscape	Promote and implement infiltration practices	
Medium Priority	Assist in the development and implementation of policies and programs that promote green infrastructure and LID practices	Promote protection of natural floodplain capacities	Collaborate with technical experts and local governments when updating, revising, or changing VRWJPO Standards
Low Priority	Ensure VRWJPO Standards can be administered by local governments	Assist local government with navigating and understanding regulatory frameworks	

Table 3-5: Prioritized Stormwater Management Topics of Importance

High Priority	Green infrastructure/LID BMPs: BMPs that act to reduce the amount of impervious surfaces including raingardens, tree trenches, green roofs, landscaping islands		
Medium Priority	Infiltration BMPs: BMPs that do not have underdrains, such as permeable pavement, sand filters, infiltration basins	Filtration BMPs: BMPs that do have underdrains, such as pretreatment filtration devices, vegetated filter strips, sand filters	Stormwater reuse projects
Low Priority	Temporary storage sedimentation BMPs: BMPs that temporarily pond water and allow for sediment to settle from the water column, including wet ponds, stormwater wetlands and manufactured devices such as hydrodynamic separators	More stringent stormwater management requirements for new development or redevelopment (discharge rate reduction, increase amounts of volume control and decrease floodplain alteration)	

Table 3-6: Prioritized Groundwater Sustainability Objectives

High Priority	Assist with and coordinate groundwater supply planning, protection, and improvement efforts with lead groundwater organizations
Medium Priority	Assist with and implement projects, programs, and practices that reduce landscape and agricultural water use
Low Priority	Assist with and implement projects, programs, and practices that promote infiltration

Table 3-7: Prioritized Groundwater Sustainability Topics of Importance

High Priority	Soil health initiatives	Residential, commercial, and industrial irrigation efficiency improvements	Agricultural irrigation efficiency improvements
Medium Priority	Projects and practices that promote natural infiltration		
Low Priority	Indoor appliance efficiency improvements		

Table 3-8: Prioritized Climate Resilience Objectives

High Priority	Foster partnerships to implement projects, programs, and practices that improve stormwater infrastructure's resilience to climate impacts		
Medium Priority	Support re-evaluation of Watershed floodplains using updated data	Foster partnerships to implement projects, programs and practices to increase the amount of green infrastructure	Promote reconnection to historic floodplains
Low Priority	Support Local Government Units in stormwater infrastructure adaptation		

Table 3-9: Prioritized Climate Resilience Topics of Importance

High Priority	Storm sewer and hard infrastructure modifications (appropriate sizing of new infrastructure, adapting historic infrastructure to new climate regimes)	Stormwater basin/retention pond modifications or improvements (larger/deeper ponds and basins)
Medium Priority	Green infrastructure best management practices (bioretention, trees, small scale rain barrels/cisterns, green roofs, permeable pavement, bioswales)	Large or industrial scale water reuse
Low Priority	Stormwater pond smart technology (automated pumping in anticipation of storm events)	

Table 3-10: Prioritized Natural Environments Objectives

High Priority	Coordinate with others to implement projects, programs, and practices that protect the Watershed's aquatic and riparian habitats	Identify and improve high-priority water resource environments found to be significantly impacted by humans
Medium Priority	Coordinate with others to implement projects, programs, and practices that improve soil health	
Low Priority	Coordinate with others to implement projects, programs, and practices that improve disturbed landscapes	

Table 3-11: Prioritized Natural Environments Topics of Importance

High Priority	Wetland restoration	Streambank/shoreline restoration
Medium Priority	In-stream habitat restoration	
Low Priority	In-lake restoration (aquatic plants, fisheries)	Upland restoration

Table 3-12: Prioritized Community Relationships Objectives

High Priority	Consistently communicate and promote the work of the VRWJPO with partners and stakeholders	Create and support opportunities for stakeholder connection and engagement with the Watershed's natural resources	
Medium Priority	Grow the amount of watershed stakeholders	Communicate with stakeholders regarding environmental issues that directly impact the watershed	Engage citizens to promote sustainable stewardship of lakes and streams
Low Priority	Maintain or increase ways for stakeholders to provide relevant input to the VRWJPO		

Table 3-13: Prioritized Community Relationships Topics of Importance

High Priority	Direct financial support for individuals' projects	Social media	Community events
Medium Priority	VRWJPO-hosted events		
Low Priority	Project interpretive signs	Marketing/media paid campaigns	Volunteer programs

3.4 Targeting

In addition to establishing a priority schedule for implementation actions, the VRWJPO looks to ensure that those programs, projects, and practices that are implemented provide the greatest positive watershed impact. This results in the attainment of water and land resource benefits while addressing constituent concerns for fiscal responsibility. To accomplish this, the Plan is organized to target geographic areas or specific VRWJPO resources based on issue category topics of importance. These targeted geographic areas or resources are then organized according to subwatershed, with the eight subwatersheds being:

- Upper Main Stem Vermillion River
- South Creek
- North Creek
- South Branch Vermillion River
- Middle Creek
- Middle Main Stem Vermillion River
- Lower Main Stem Vermillion River
- Mississippi River Direct

Targeting is informed via chemical and physical monitoring, biological monitoring, pollutant load modeling, subwatershed assessments, geomorphic assessments, the WRAPS process, waterbody impairment designations, the tiered aquatic life use framework, GIS analyses, restorable wetland assessments, TMDL studies, surface water and groundwater interactions, and land use trends. Details relating to subwatershed and geomorphic assessment findings, monitoring trends, pollutant yield modeling, and priority wetland restoration assessments can be found in Appendix B. An inventory of studies also used to formulate targeting metrics can be found in Appendix A. By relying on sound scientific data to inform our work, the VRWJPO provides additional assurances that work is performed in the most meaningful and cost-effective way.

The exception to the aforementioned targeting approach relates to the Community Relationships Issue Category. Due to the nature of this issue category involving education, outreach, and community engagement, it would not be appropriate to target on a geographic scale unless directed by other Issue Categories. Instead, targeting for this issue category:

- Targets audiences, such as community groups, residents, landowners, businesses, students and elected and appointed officials
- Relies on targeting regimes defined within other issue categories. For example, financial incentives for individuals' projects was a high ranking topic of importance within this issue category. If subwatershed assessment resulted in an activity in the Water Quality issue category identifying the need for residential rain gardens within a specific subwatershed, staff may target audiences in that specific subwatershed for VRWJPO Stewardship Grants.

Targeting details relating to each issue category, with the exception of Community Relationships, are described below.

Issue Category 1: Water Quality

Projects that address nutrients (phosphorus and nitrate)

- Subwatersheds with lakes
- Areas modeled to show they produce the highest TP pollutant yields

- Subwatersheds that have been modeled to show they produce the highest nitrate pollutant yields
- Areas that are identified as priority agricultural chemical reduction areas within the Dakota County Groundwater Plan

Projects that address TSS/sediment

- Subwatersheds that have been modeled to show they produce the highest TSS pollutant yields
- Subwatersheds with waterbodies that have TSS impairments

Projects that address aquatic biota (temperature and dissolved oxygen)

- Areas identified within geomorphic assessments
- Waterbodies listed as not supporting aquatic life
- Stream reaches that have been artificially channelized and/or ditched
- Streams that are DNR-designated trout streams
- Areas within 1,000 feet of a river or tributary upstream of State Highway 52

Projects that address chloride

- Areas with high percentage of impervious surfaces
- Those areas in which 1999 – 2019 (and new data as it becomes available) Dakota County well monitoring found increasing chloride concentration trends
- Areas that show increasing chloride concentration trends based on VRMN data

Projects that address toxics/metals/emerging concern contaminants/pesticides/herbicides

- Waterbodies within municipalities that are confirmed to have toxics/metals/emerging concern contaminants above health risk standards
- Areas where private wells show concentrations of toxics/metals/emerging concern contaminants
- Communities that have been significantly affected by emerging concern contaminants
- Areas that have pesticide and/or herbicide concentrations above health risk standards based on 2001-2019 (and new data as it becomes available) Dakota County well monitoring

Projects that address bacteria

- Areas found to have consistently high bacteria concentrations based on monitoring
- Areas defined as moderate, high, or very high priority based on VRWJPO-Prioritized Feedlot Inventory

Projects that address AIS

- Lakes that are relatively hydrologically isolated
- Lakes that are listed as infested according to the DNR's Infested Waters List

Issue Category 2: Stormwater Management

Infiltration BMPs

- Projects identified in a subwatershed assessment

- Watershed-wide LGU CIP collaboration
- Downstream of or within areas that have documented flooding issues
- Areas with soil types A and B
- Areas in public ownership

Filtration BMPs

- Projects identified in a subwatershed assessment
- Watershed-wide LGU CIP collaboration
- Areas with soil type C and D
- Areas where an Emergency Response Area (ERA) within a Drinking Water Supply Management Area (DWSMA) is classified as having high or very high vulnerability as defined by the Minnesota Department of Health (MDH) or regulated by an LGU's Municipal Separate Storm Sewer System (MS4) Permit
- Areas in public ownership

Temporary storage sedimentation BMPs

- Projects identified in a subwatershed assessment
- Areas in public ownership
- Downstream of or within areas that have documented flooding issues
- Downstream of or within areas with little or no stormwater management practices
- Watershed-wide LGU Capital Project collaboration

Green infrastructure/LID BMPs

- Projects identified in subwatershed assessments
- Stormwater treatment retrofits within urbanized areas with high impervious surface land cover
- Downstream of or within areas with little or no stormwater management practices
- Watershed-wide LGU Capital Project collaboration
- Areas with soil types A and B

Stormwater reuse projects

- Watershed-wide LGU Capital Project collaboration
- Within areas with little or no stormwater management practices
- Areas in public ownership
- Areas that preclude infiltration
- Municipalities in which the Metropolitan Council Master Water Supply Plan predicts future aquifer drawdown

More stringent stormwater management requirements

- Meet or exceed Minnesota Pollution Control Agency (MPCA) or MDH standards for stormwater treatment

Issue Category 3: Groundwater Supply

Soil health initiatives

- Rural areas with highly erodible soils
- Subwatersheds that have been modeled to show they produce the highest NO3 pollutant yields
- Those areas that are within MDH-designated Drinking Water Supply Management Areas
- Those areas with coarse-textured soils

Projects and practices that promote natural infiltration

- Areas identified as Desired Recharge Areas within the Dakota County Groundwater Plan

- Projects identified within subwatershed assessments
- Areas with A and B type soils
- Urban areas with little to no stormwater treatment

Agricultural irrigation efficiency improvements

- Agricultural areas projected to have the largest aquifer drawdown according to the Metropolitan Council Master Water Supply Plan
- Top agricultural irrigation water users according to Minnesota Permitting and Reporting System (MPARS) data

Residential, commercial, and industrial irrigation efficiency improvements

- Residential – those homes constructed post-2000, HOAs, municipality-identified high-water users according to city utility billing data
- Non-residential – those with large greenspace, golf courses, industry, commercial, public facilities, institutional facilities

Indoor appliance efficiency improvements

- Public schools and public facilities
- Homes built pre-2010

Issue Category 4: Climate Resilience

Large or industrial-scale water reuse

- Within municipalities identified as higher water users
- Areas identified by Metropolitan Council Master Water Supply Plan with predicted higher aquifer drawdown
- Areas with soil type C and D

Green infrastructure BMPs

- Projects identified in a subwatershed assessment
- Stormwater treatment retrofits within urbanized areas with high impervious surface land cover
- Downstream of or within areas with little or no stormwater management practices
- Watershed-wide LGU CIP Project collaboration
- Areas with soil types A and B

Storm sewer and hard infrastructure modifications or improvements

- Priority areas based on outcomes of forthcoming climate resiliency study and assessment
- Areas in public ownership
- Areas with buildings and critical infrastructure at risk from flooding
- Watershed-wide LGU CIP Project collaboration
- Downstream of or within areas with little or no stormwater infrastructure

Stormwater basin/retention pond modifications or improvements

- Stormwater treatment retrofits within urbanized areas with high impervious surface land cover
- Watershed-wide LGU CIP Project collaboration
- Areas in public ownership
- Downstream of or within areas that have documented flooding issues
- Priority areas based on outcomes of forthcoming climate resiliency study and assessment

Stormwater pond smart technology

- Watershed-wide LGU CIP Project collaboration

- Within areas where remote data delivery infrastructure is in place
- Areas in public ownership

Issue Category 5: Natural Environments

In-stream habitat restoration

- Areas identified within completed geomorphic assessments
- DNR-designated trout streams or principal connectors
- Stream reaches that have been artificially channelized or ditched

Wetland restoration

- Priority areas identified in restorable wetland assessments
- Areas that expand upon previously restored wetlands

Streambank/shoreline restoration

- Areas identified within geomorphic assessments
- Areas in majority public ownership

Upland restoration

- Areas with a prevalence of invasive species based on the DNR invasive plants list
- Upland areas that are directly adjacent to lakes, streams, and wetlands
- Areas identified as Conservation Focus Areas in the Dakota County Land Conservation Plan

In-lake restoration

- Lakes that are nearly meeting or have met external nutrient loading targets
- Lakes that have increasing water clarity, thus increasing potential to support native plant restoration
- Lakes that have improving in-lake habitat, thus increasing potential to support native fisheries

3.5 Implementation Table

The Plan Implementation Table combines information relating to issues, goals, objectives, prioritization, and targeting to present annual work plan and budgetary expectations from 2026-2035. Actions are organized according to issue category and priority, and identify targeted resources/audience, objectives addressed, date of planned implementation, and financing. To meet the requirements of MN Rule 8410.0105, an Administration Category is also included. In addition, actions identify expected partners, funding sources, and VRWJPO budget categories. CIP-specific programs, projects, and practices can be isolated referencing only those actions that identify as being funded by the CIP and Maintenance budget category.

When reviewing the annual action costs, it is important to note that the number incorporated by year does not reflect the full cost to implement for all Actions, but rather the VRWJPO's expected contribution to such an initiative. For example, if an Action identifies funding sources of General Fund, Partner Funds and Grants, the number identified within the financing section of the Implementation Table represents the VRWJPO's contribution to such an initiative. Grant funds and partner funds would then also be needed to fully implement said Action.

Actions that are solely identified as being sourced from the General Fund, however, are representatives of both the full cost to implement as well as VRWJPO's expected contribution. This is reflected within the entirety of actions belonging within the Administration and Community Relationships categories.

Operations and maintenance programs relating to inspection, operation and maintenance of stormwater infrastructure, public works, facilities and natural and artificial watercourses are not included within the Implementation Table or other aspects of this Plan, as they are the responsibility of watershed LGUs. However, the VRWJPO adopted a Policy in 2025 for Watershed Partner Project Maintenance to ensure that those CIP projects implemented either independently by the VRWJPO or with assistance from watershed partners are routinely inspected and maintained to retain original design performance standards. Generally,

- VRWJPO staff inspect all CIPs implemented since 2006 on a biennial basis
- Following inspection, VRWJPO staff prepare a CIP maintenance inspection report including photographs, narratives relating to site conditions, and required follow-up items
- VRWJPO staff provide partnering LGUs a copy of the CIP maintenance inspection report (as applicable)
- LGUs and VRWJPO enter into agreements to address any necessary design or maintenance work (as applicable)
- VRWJPO intends to offer funding for needed maintenance in accordance with the Watershed Partner Project Maintenance Policy on an annual basis subject to JPB approval

This process is reflected by the CIP Maintenance action in the Implementation Table.

In addition, during the 2016-2025 Watershed Management Plan, the Scott County Board was the drainage authority for Scott County Ditch 12 (CD 12), which was the only drainage ditch within the VRWJPO regulated by MN Statute 103E. On April 15, 2025, the Scott County Board of Commissioners adopted Resolution No. 2025-122, abandoning CD 12. As such, no implementation actions relating to inspection, operation and maintenance of any 103E regulated drainage ditches are included.

Implementation of VRWJPO Standards

The VRWJPO regulatory program, known as the VRWJPO Standards, are included within Appendix D, and are not reflected within the Implementation Table. VRWJPO Standards have provisions relating to:

- Floodplain Alterations
- Wetland Alterations
- Buffers
- Erosion and Sediment Control
- Stormwater Management
- Drainage Alteration

LGUs are responsible for adopting LWPs and local controls that implement the WMP, including the VRWJPO Standards. Pursuant to MN Statute 103B.235, the VRWJPO must approve all LWP's within the watershed. LGU local controls must meet or exceed the VRWJPO's Standards and must be implemented through the LGU's permitting programs. LGUs may elect to adopt the VRWJPO Plan by reference, though this option still requires

creation or revision of local ordinances to meet the VRWJPO Standards.

If an LGU's official controls are deemed inadequate or cannot be enforced, the VRWJPO will assume permitting authority until such time as VRWJPO standards are met. During this period, the VRWJPO will review plans, issue permits, perform site inspections, and monitor activities necessary to ensure compliance with the VRWJPO Standards. Expenditures relating to implementation of the VRWJPO Standards and regulatory program are reflected in the Implementation Table Staffing Action (A-1).

The 2026-2035 Implementation Plan can be found on the following pages. The plan is presented in two formats. Distinguishing characteristics for each format include:

Format One: 10-Year Expenses

- Detailed descriptions for each action
- Priority designation of actions
- Objectives/audiences addressed for each action
- 10-year costs associated with each action
- A summary table describing 10-year costs associated with each issue category

Format Two: Annual Expenses

- Annual expenses associated with each action from 2026-2035
- A summary table describing annual costs associated with each issue category from 2026-2035

Table 3-14: VRWJPO 2026-2035 Implementation Plan: 10-Year Expenses

Category	Item ID	Action	Description	Priority Level	Objective(s) Addressed	Target Resource/Audience	Partners	Funding Source	Budget Category	*Total 10-Year Cost
Water Quality	WQ-1	Vermillion River Monitoring Network	Annually administer the VRMN, including physical, chemical and biological monitoring. Costs include: DCSWCD staff/consultant time for water quality, aquatic macroinvertebrate and fish monitoring; data analyses; samples analyses; report preparation; agency coordination; equipment/supplies and United States Geological Survey (USGS) and DNR flow gaging.	High	Use surface water quality monitoring data to inform restoration and protection decisions.	Watershed-wide	DCSWCD, SSWCD, DNR, MPCA	General Fund	Inventory, Assessment and Research	$1,226,635
	WQ-2	Assessments	Fund additional subwatershed, geomorphic and other assessments to identify projects and practices as well as their project costs and pollutant loading reductions or water resource/habitat improvement metrics.	High	Protect surface waters from impairments. Remove surface waters from the impaired waters list.	Watershed-wide	Many	General Fund, Grants	Inventory, Assessment and Research	$35,000
	WQ-3	Projects Identified within City of Lakeville North Creek and East Lake Subwatershed Assessment	Implement projects such as: infiltration, filtration, ponding, reuse, hydrodynamic separator and MTDs identified within the North Creek and East Lake Subwatershed Assessment conducted within the bounds of the City of Lakeville.	High	Protect surface waters from impairments. Remove surface waters from the impaired waters list.	North Creek and East Lake	City of Lakeville	General Fund, Partner Funds, Grants	CIP and Maintenance	$180,000
	WQ-4	Projects Identified within City of Apple Valley East Lake Subwatershed Assessment	Implement projects such as infiltration, diversion, reuse and alum identified within the East Lake Subwatershed Assessment conducted within the bounds of the City of Apple Valley.	High	Remove surface waters from the impaired waters list.	East Lake	City of Apple Valley	General Fund, Partner Funds, Grants	CIP and Maintenance	$345,000
	WQ-5	Projects Identified within Vermillion River Headwaters Subwatershed Assessment Projects	Implement projects such as filter strips, grassed waterways, WASCOBs, wetland restoration and native grasses identified within the Vermillion River Headwaters subwatershed assessment.	High	Remove surface waters from the impaired waters list. Protect surface waters from impairments.	Vermillion River Headwaters	SSWCD, Landowners	Grants, Partner Funds	CIP and Maintenance	$100,309
	WQ-6	Projects Identified within Upper Mainstem Subwatershed Assessment	Implement projects such as filter strips, grassed waterways, WASCOBs, streambank and shoreline stabilizations identified within the Upper Mainstem subwatershed assessment.	High	Remove surface waters from the impaired waters list. Protect surface waters from impairments.	Upper Mainstem Subwatershed	Landowners, DCSWCD	Grants, Partner Funds	CIP and Maintenance	$315,257
	WQ-7	Projects Identified within South Branch Vermillion River Subwatershed Assessment	Implement projects such as grassed waterways, WASCOBs, critical area plantings, filter strips, grade stabilizations, streambank stabilizations and wetland restorations identified within the South Branch Vermillion River subwatershed assessment.	High	Remove surface waters from the impaired waters list. Protect surface waters from impairments.	South Branch Vermillion River Subwatershed	Landowners, DCSWCD	Grants, Partner Funds	CIP and Maintenance	$100,309

Table 3-14: VRWJPO 2026-2035 Implementation Plan: 10-Year Expenses

Category	Item ID	Action	Description	Priority Level	Objective(s) Addressed	Target Resource/Audience	Partners	Funding Source	Budget Category	*Total 10-Year Cost
Water Quality	WQ-8	Projects Identified within Vermillion Lower Mainstem South Subwatershed Assessment	Implement projects such as WASCOBS and grassed waterways identified within the Vermillion Lower Mainstem South subwatershed assessment.	High	Remove surface waters from the impaired waters list. Protect surface waters from impairments.	Lower Mainstem Subwatershed	Landowner, DCSWCD	Grants, Partner Funds	CIP and Maintenance	$100,309
	WQ -9	Opportunity Projects/assessments	Through the life of the Plan, the VRWJPO will remain open to projects, initiatives, studies or other opportunities that align with Plan goals and objectives as they arise which are unknown at the time of Plan creation.	Medium	Many	Watershed-wide	Many	General Fund, Partner Funds, Grants	All Budget Categories excluding Administration and Operations	$8,000
	WQ-10	BMP Performance Monitoring	Monitor performance of pollutant reductions associated with BMPs implemented with funding assistance from grant or partner dollars.	Medium	Use surface water quality monitoring data to inform restoration and protection decisions.	Watershed-wide	Many	General Fund	Inventory, Assessment and Research	$22,800
	WQ-11	Vermillion River Groundwater Interaction Assessment	Fund an assessment in the Hastings DWSMA to investigate surface water-groundwater interaction from the Vermillion River and its tributaries.	Medium	Coordinate with others to assess impacts to groundwater from the Vermillion River and its tributaries.	South Branch, Lower Mainstem, and Mississippi Direct Subwatersheds	Dakota County, City of Hastings	General Fund, Partner Funds, Grants	Inventory, Assessment and Research	$49,400
	WQ-12	Groundwater Quality Projects, Programs and Practices	Assist lead groundwater organizations with projects, programs and practices that protect or improve groundwater quality.	Medium	Support and implement projects, programs and practices to protect or improve groundwater quality.	Watershed-wide	Many	General Fund, Partner Funds	CIP and Maintenance	$200,618
	WQ-13	Enhanced Street Sweeping Study	Complete an Enhanced Street Sweeping Study to prioritize areas for enhanced sweeping based on pollutant recovery/removal potentials.	Medium	Remove surface waters from the impaired waters list. Protect surface waters from impairments.	Regulated MS4s	Dakota County	General Fund, Partner Funds	Inventory, Assessment and Research; and Communication, Outreach and Public Relations	$45,000
	WQ-14	Assist with Development of Low Salt Design Standards	Support the development of low salt design and stormwater management standards.	Medium	Protect surface waters from impairments. Support and implement projects, programs and practices that protect or improve groundwater quality.	Watershed-wide	Many	General Fund	Administration and Operations; Regulation	$10,000

Table 3-14: VRWJPO 2026-2035 Implementation Plan: 10-Year Expenses

Category	Item ID	Action	Description	Priority Level	Objective(s) Addressed	Target Resource/Audience	Partners	Funding Source	Budget Category	*Total 10-Year Cost
Water Quality	WQ-15	Projects that Address E. coli	Partner with lead agencies to investigate and implement projects that address E. coli in Scott County.	Low	Remove surface waters from the impaired waters list. Use surface water monitoring data to inform restoration and protection decisions.	Upper Mainstem Subwatershed	SSWCD, Scott County	General Fund, Partner Funds	Inventory, Assessment and Research	$7,500
	WQ-16	Projects that Address Toxics/Metals/ECOC/Pesticides	Investigate opportunities to partner with lead agencies to implement projects that address toxics/metals/ECOC/pesticides.	Low	Support and implement projects, programs and practices to protect or improve groundwater quality.	Watershed-wide	Many	General Fund, Partner Fund, Grants	Many	+
Stormwater Management	SW-1	Projects Identified within Hastings Direct Drainage Subwatershed Assessment	Implement projects such as infiltration, filtration and hydrodynamic separators identified within the Hastings Direct Drainage Assessment Report.	High	Promote and implement infiltration practices. Promote and implement stormwater practices that manage the peak rate and volume of runoff from the landscape.	Lower Mississippi Direct Subwatershed	City of Hastings	Grants, Partner Funds	CIP and Maintenance	$130,000
	SW-2	Projects Identified within South Creek Subwatershed Assessment	Implement projects such as infiltration, filtration, pervious paver, boulevard tree trench, cistern, wetland and stream revitalization, and MTDs identified within South Creek Subwatershed Assessment.	High	Promote and implement infiltration practices. Promote and implement stormwater practices that manage the peak rate and volume of runoff from the landscape.	South Creek Subwatershed	City of Lakeville, Landowners, Dakota County	General Fund, Partner Funds, Grants	CIP and Maintenance	$30,000
	SW-3	Projects Identified within City of Farmington Subwatershed Assessment	Implement projects such as treatment train, underground vault/pipe gallery and biofiltration projects identified within City of Farmington Subwatershed Assessment.	High	Promote and implement infiltration practices. Promote and implement stormwater practices that manage the peak rate and volume of runoff from the landscape.	North Creek, Middle Creek and Middle Mainstem Subwatersheds	City of Farmington	General Fund, Partner Funds, Grants	CIP and Maintenance	$75,000
	SW-4	Projects Identified within City of Farmington Stormwater Retrofit Assessment for Independent School District 192	Implement projects such as bioretention basin, retention pond, impervious reduction and stormwater reuse identified within City of Farmington Stormwater Retrofit Assessment for Independent School District 192.	High	Promote and implement infiltration practices. Promote and implement stormwater practices that manage the peak rate and volume of runoff from the landscape.	North Creek, Middle Creek and Middle Mainstem Subwatersheds	City of Farmington	General Fund, Partner Funds, Grants	CIP and Maintenance	+

Table 3-14: VRWJPO 2026-2035 Implementation Plan: 10-Year Expenses

Category	Item ID	Action	Description	Priority Level	Objective(s) Addressed	Target Resource/Audience	Partners	Funding Source	Budget Category	*Total 10-Year Cost
Stormwater Management	SW-5	Innovative Stormwater Management Projects and Practices	Implement innovative stormwater management projects in partnership with LGUs including, but not limited to: green infrastructure, stormwater reuse and LID BMPs.	High	Promote and implement infiltration practices. Promote and implement stormwater practices that manage the peak rate and volume of runoff from the landscape.	Watershed-wide	Cities, Counties	General Fund, Partner Funds, Grants	CIP and Maintenance	$270,000
	SW-6	Opportunity Projects/assessments	Through the life of the Plan, the VRWJPO will remain open to projects, initiatives, studies or other opportunities that align with Plan goals and objectives as they arise which are unknown at the time of Plan creation.	Medium	Many	Watershed-wide	Many	General Fund, Partner Funds, Grants	All Budget Categories excluding Administration and Operations	$8,000
	SW-7	Projects identified within the Long and Farquar TMDL Implementation Plan and Long and Farquar Pond Feasibility Analysis	Implement stormwater projects identified within the Long and Farquar TMDL Implementation Plan such as: road corridor BMPs, infiltration benches, infiltration basins, private large lot redevelopments and residential BMPS/buffers/sweeping. Implement projects identified within the Long and Farquar Pond Feasibility Analysis.	Medium	Promote and implement infiltration practices. Promote and implement stormwater practices that manage the peak rate and volume of runoff from the landscape.	Long and Farquar Lakes	City of Apple Valley	General Fund, Partner Funds, Grants	CIP and Maintenance	$58,000
	SW-8	Low Impact Development Practice Policies and Programs	Promote implementation of LID practices through the development of policies and programs to further adoption.	Medium	Assist in the development and implementation of policies and programs that promote green infrastructure and Low Impact Development practices.	Urban and Suburban Landscapes	Many	General Fund	Many	+
Groundwater Sustainability	GS-1	Groundwater Conservation Assessments	Collaborate with partners for local, regional and state groundwater conservation assessments.	High	Assist with and coordinate groundwater supply planning, protection and improvement efforts with lead groundwater organizations.	Watershed-wide	Many	General Fund	Inventory, Assessments and Research	$10,000
	GS-2	Projects, Programs and Practices Identified within the Dakota County Groundwater Plan's Groundwater Quantity Tactics	Implement projects, programs and practices identified within the Dakota County Groundwater Plan such as: a VRWJPO-wide water supply/conservation initiative, cost-sharing for water conservation projects, working with the DNR to ensure large groundwater appropriation requests are sustainable, and more.	Medium	Assist with and implement projects, programs and practices that reduce landscape and agricultural water use. Assist with and implement projects, programs and practices that promote infiltration.	Dakota County	Dakota County, LGUs, DCSWCD	General Fund, Grants, Partner Funds	CIP and Maintenance; Regulation; Inventory, Assessments and Research	$75,000

Table 3-14: VRWJPO 2026-2035 Implementation Plan: 10-Year Expenses

Category	Item ID	Action	Description	Priority Level	Objective(s) Addressed	Target Resource/ Audience	Partners	Funding Source	Budget Category	*Total 10-Year Cost
Groundwater Sustainability	GS-3	Groundwater Conservation Assessment Projects	Implement projects, programs and practices identified within other groundwater conservation assessments.	Medium	Assist with and implement projects, programs and practices that reduce landscape and agricultural water use. Assist with and implement projects, programs and practices that promote infiltration.	Watershed-wide	Many	General Fund, Grants, Partner Funds	CIP and Maintenance	+
	GS-4	Soil Health Initiative Partnerships	Assist with implementation and promotion of partner soil health programs.	Medium	Assist with and implement projects, programs and practices that reduce landscape and agricultural water use.	Urban and Suburban Landscapes	Many	General Fund, Grants, Partner Funds	CIP and Maintenance; Communications, Outreach and Public Relations	+
	GS-5	Opportunity Projects/assessments	Through the life of the Plan, the VRWJPO will remain open to projects, initiatives, studies or other opportunities that align with Plan goals and objectives as they arise which are unknown at the time of Plan creation.	Medium	Many	Watershed-wide	Many	General Fund, Partner Funds, Grants	All Budget Categories excluding Administration and Operations	$8,000
Climate Resilience	CR-1	Climate Resiliency Plan	Partner in the development of a Climate Resiliency Plan to establish a baseline assessment of climate resiliency and develop strategic goals and recommendations to move towards a more climate resilient Watershed. Scope to include, but not be limited to: inventory of inadequate stormwater infrastructure, feasibility of stormwater pond smart technology, flood risk assessment and natural resource susceptibilities to drought.	High	Foster partnerships to implement projects, programs and practices that improve stormwater infrastructure's resilience to climate impacts.	Watershed-wide	Many	General Fund, Grants	Feasibility/ Preliminary Engineering; Inventory, Assessment and Research	$100,000
	CR-2	Climate Resilient Project Incentives	Provide incentives for projects identified within the Climate Resiliency Plan.	High	Foster partnerships to implement projects, programs and practices that improve stormwater infrastructure's resilience to climate impacts.	Urban and Suburban Landscapes	Cities, Counties, SWCDs	General Fund, Partner Funds, Grants	CIP and Maintenance	$153,000

Table 3-14: VRWJPO 2026-2035 Implementation Plan: 10-Year Expenses

Category	Item ID	Action	Description	Priority Level	Objective(s) Addressed	Target Resource/Audience	Partners	Funding Source	Budget Category	*Total 10-Year Cost
Climate Resilience	CR-3	Floodplain Reconnection	Implement restoration and enhancement projects that connect water resources to the historic floodplain.	Medium	Promote reconnection to historic floodplains	Floodplains	Many	General Fund, Partner Funds, Grants	CIP and Maintenance; Feasibility/ Preliminary Engineering	$153,000
	CR-4	Opportunity Projects/assessments	Through the life of the Plan, the VRWJPO will remain open to projects, initiatives, studies or other opportunities that align with Plan goals and objectives as they arise which are unknown at the time of Plan creation.	Medium	Many	Watershed-wide	Many	General Fund, Partner Funds, Grants	All Budget Categories excluding Administration and Operations	$55,000
	CR-5	Stormwater Infrastructure Adaptation	Partner with LGUs to upgrade existing stormwater infrastructure to be more climate resilient.	Low	Support LGUs in stormwater infrastructure adaptation	Urban and Suburban Landscapes	LGUs	General Fund, Partner Funds, Grants	CIP and Maintenance	$45,000
	CR-6	Green Infrastructure BMPs	Implement green infrastructure BMPs in partnership with LGUs.	Low	Foster partnerships to implement projects, programs and practices to increase the amount of green infrastructure	Urban and Suburban Landscapes	LGUs	General Fund, Partner Funds, Grants	CIP and Maintenance	+
	CR-7	Updated Floodplain Model	Assist partners in the investigation of updated floodplain models.	Low	Support re-evaluation of Watershed floodplains using updated data	Watershed-wide	Cities, Counties, DNR	General Fund, Partner Funds	Feasibility/ Preliminary Engineering	+
Natural Environments	NE-1	Projects identified within the South Creek Geomorphic Assessment	Implement projects such as: natural channel restoration/relocation, grade control, floodplain management, riparian management, bank stabilization and culvert crossing projects identified within the South Creek Geomorphic Assessment.	High	Coordinate with others to implement projects, programs and practices that protect the Watershed's aquatic and riparian habitats.	South Creek Subwatershed	City of Lakeville, Dakota County	Grants, Partner Funds	CIP and Maintenance	$85,000
	NE-2	Projects identified within the Etter Creek and Ravenna Coulee Geomorphic Assessment	Implement projects such as: natural channel restoration/relocation, grade control, floodplain management, riparian management, bank stabilization and culvert crossing projects identified within the Ravenna Coulee Geomorphic Assessment.	High	Coordinate with others to implement projects, programs and practices that protect the Watershed's aquatic and riparian habitats.	Mississippi Direct Subwatershed	Dakota County, DCSWCD	Grants, Partner Funds	CIP and Maintenance	$10,000

Table 3-14: VRWJPO 2026-2035 Implementation Plan: 10-Year Expenses

Category	Item ID	Action	Description	Priority Level	Objective(s) Addressed	Target Resource/Audience	Partners	Funding Source	Budget Category	*Total 10-Year Cost
Natural Environments	NE-3	Projects identified within the Middle and North Creek Geomorphic Assessment	Implement projects such as: bank stabilization, floodplain management, grade control, natural channel restoration and riparian management projects identified within the Middle and North Creek Geomorphic Assessment.	High	Coordinate with others to implement projects, programs and practices that protect the Watershed's aquatic and riparian habitats.	Middle Creek and North Creek Subwatersheds	City of Lakeville, City of Farmington, Dakota County	Grants, Partner Funds	CIP and Maintenance	$45,000
	NE-4	Projects identified within the Empire Drainages Geomorphic Assessment	Implement projects such as: bank stabilization, culvert crossing, natural channel restoration, infrastructure and riparian management projects identified within the Empire Drainages Geomorphic Assessment.	High	Coordinate with others to implement projects, programs and practices that protect the Watershed's aquatic and riparian habitats.	Middle Mainstem Subwatershed	City of Empire, DCSWCD	Grants, Partner Funds	CIP and Maintenance	$20,000
	NE-5	Projects identified within the Lower Mainstem Geomorphic Assessment	Implement projects such as: bank stabilization, riparian management and infrastructure improvement projects identified within the Lower Mainstem Geomorphic Assessment.	High	Coordinate with others to implement projects, programs and practices that protect the Watershed's aquatic and riparian habitats.	Lower Mainstem Subwatershed	Dakota County, DCSWCD	Grants, Partner Funds	CIP and Maintenance	$20,000
	NE-6	VRWJPO Wetland Banking Program	Restore priority wetlands and administer the VRWJPO Wetland Banking Program to achieve a no-net-loss of wetlands within the watershed.	High	Identify and improve high-priority water resource environments found to be significantly impacted by humans.	Restorable Wetlands	SWCDs, Counties, BWSR	General Fund, Partner Funds, Grants	CIP and Maintenance	+
	NE-7	Priority Wetland Restoration	Restore areas identified within Priority Wetland Restoration studies, not just for the purpose of the creation of a wetland bank.	High	Identify and improve high-priority water resource environments found to be significantly impacted by humans.	Restorable Wetlands	Many	General Fund, Partner Funds	CIP and Maintenance	$105,000
	NE-8	East Lake In-lake Projects and Practices	Implement projects and practices to address East Lake's LA defined within the Vermillion River Watershed TMDL. Examples include, but are not limited to: invasive fish management, fish stocking, native aquatic plant establishment, AIS management, alum treatments, lake drawdown and shoreline restorations.	High	Coordinate with others to implement projects, programs and practices that protect the Watershed's aquatic and riparian habitats.	East Lake	City of Apple Valley, City of Lakeville, DNR, Dakota County	General Fund, Partner Funds, Grants	CIP and Maintenance	$45,000
	NE-9	Cost-share for DCSWCD and SSWCD Incentive Programs	Provide cost-share for the following programs: DCSWCD's Incentive Payment Practices Program; SSWCD's Cover Crop and Soil Health Incentives; and others as they are developed.	Medium	Coordinate with others to implement projects, programs and practices that improve soil health	Agricultural Landscapes	DCSWCD and SSWCD	General Fund	CIP and Maintenance	$272,267

Table 3-14: VRWJPO 2026-2035 Implementation Plan: 10-Year Expenses

Category	Item ID	Action	Description	Priority Level	Objective(s) Addressed	Target Resource/Audience	Partners	Funding Source	Budget Category	*Total 10-Year Cost
Natural Environments	NE-10	In-stream Habitat Restoration	Implement projects not identified in a geomorphic assessment that restore in-stream habitat.	Medium	Coordinate with others to implement projects, programs and practices that protect the Watershed's aquatic and riparian habitats.	Streams	Many	General Fund, Grants, Partner Funds	CIP and Maintenance	$190,000
	NE-11	Opportunity Projects/assessments	Through the life of the Plan, the VRWJPO will remain open to projects, initiatives, studies or other opportunities that align with Plan goals and objectives as they arise which are unknown at the time of Plan creation.	Medium	Many	Watershed-wide	Many	Many	All Budget Categories excluding Administration and Operations	$8,000
	NE-12	In-lake management projects identified within the Long and Farquar TMDL Implementation Plan	In-lake management projects identified within the Long and Farquar TMDL Implementation Plan such as: AIS management activities, fisheries management (surveys, stocking, removals), aeration and lake drawdown.	Low	Coordinate with others to implement projects, programs and practices that protect the Watershed's aquatic and riparian habitats.	Long and Farquar Lakes	DNR and City of Apple Valley	Grants, Partner Funds, General Fund	CIP and Maintenance	+
	NE-13	Upland Restoration Adjacent to Water Resources	Partner with stakeholders to restore upland areas adjacent to lakes, rivers, and wetlands.	Low	Coordinate with others to implement projects, programs and practices that protect the Watershed's aquatic and riparian habitats.	Watershed-wide	Many	Grants, Partner Funds, General Fund	Public Communications, Outreach and Public Relations; CIP Maintenance	$5,000
Community Relationships	CMR-1	Stewardship Grants	Provide cost-share funding to individuals and groups in the watershed who are looking to install BMPs with direct water resource benefits.	High	Create and support opportunities for stakeholder connection and engagement with the Watershed's natural resources. Engage citizens to promote sustainable stewardship of lakes and streams.	Residents, landowners, businesses, community groups	Many	General Fund	Public Communications, Outreach and Public Relations; Administration and Operations	$346,221
	CMR-2	Public Event Participation	Host display tables at community events where attendees are likely to be interested in environmental topics. Examples may include, but are not limited to: Dakota County Fair, Take a Kid Fishing Day, Home and Garden Expos, Parks and Recreation Month, Fix-It Clinics	High	Consistently communicate and promote the work of the VRWJPO with partners and stakeholders. Grow the amount of watershed stakeholders.	Many	Many	General Fund	Public Communications, Outreach and Public Relations	$96,221
	CMR-3	Maintain Website	Keep the VRWJPO website up to date by regularly reviewing and posting pertinent content. Website contents include: upcoming events; watershed project updates; project fact sheets; watershed assessment studies; volunteer opportunities; recreational resources; and anything else determined relevant.	High	Consistently communicate and promote the work of the VRWJPO with partners and stakeholders. Maintain or increase ways for stakeholders to provide relevant input to the VRWJPO.	Many	N/A	General Fund	Public Communications, Outreach and Public Relations	$53,456

Table 3-14: VRWJPO 2026-2035 Implementation Plan: 10-Year Expenses

Category	Item ID	Action	Description	Priority Level	Objective(s) Addressed	Target Resource/Audience	Partners	Funding Source	Budget Category	*Total 10-Year Cost
Community Relationships	CMR-4	Distribute Newsletter	Electronically distribute VRWJPO newsletter with watershed updates, news, and tips.	High	Consistently communicate and promote the work of the VRWJPO with partners and stakeholders. Communicate with stakeholders regarding the environmental issues that directly impact the watershed.	Newsletter subscribers	Many	General Fund	Public Communications, Outreach and Public Relations	$85,530
	CMR-5	Partner Programs	Annually plan, promote and provide financial incentives for programs that align with the goals and objectives of this Plan. Examples include, but are not limited to: the Dakota SWCD Landscaping for Clean Water Program, the Dakota County Lawns Reimagined Program, Scott SWCD Clean Water Education Program, Smart Salting Trainings in Dakota County, Turfgrass Maintenance Trainings in Dakota County, volunteer events with direct benefits to the watershed (e.g. Trout Unlimited)	High	Create and support opportunities for stakeholder connection and engagement with the Watershed's natural resources. Engage citizens to promote sustainable stewardship of lakes and streams.	Watershed-wide	Many	General Fund	Public Communications, Outreach and Public Relations	$899,915
	CMR-6	Social Media Presence	Engage stakeholders and the public through insightful social media posts. Topics include, but are not limited to: project updates, BMP suggestions for residents, relevant news articles, photos from around the watershed, events, on Facebook and Instagram.	High	Communicate with stakeholders regarding environmental issues that directly impact the watershed	Many	Many	General Fund	Public Communications, Outreach and Public Relations	$138,986
	CMR-7	Collaborative Education and Outreach	Collaborate with partners to develop and distribute educational materials on topics including, but not limited to: MS4 Permit requirements to reduce stormwater pollution; residential BMPs to improve water quality; water conservation BMPs; indoor appliance water conservation rebates; soil health; interesting fish and macroinvertebrate information	Medium	Communicate with stakeholders regarding environmental issues that directly impact the watershed. Grow the number of watershed stakeholders.	Residents, landowners, businesses	LGUs	General Fund	Public Communications, Outreach and Public Relations	$117,603
	CMR-8	Engagement with Schools in the VRWJPO	Connect with teachers and education professionals in the watershed and participate in their programming as appropriate. Examples may include but are not limited to Outdoor Education Days, Earth Day events, in-class discussions.	Medium	Grow the number of watershed stakeholders	Students	DCSWCD and SSWCD	General Fund	Public Communications, Outreach and Public Relations	$83,456

Table 3-14: VRWJPO 2026-2035 Implementation Plan: 10-Year Expenses

Category	Item ID	Action	Description	Priority Level	Objective(s) Addressed	Target Resource/Audience	Partners	Funding Source	Budget Category	*Total 10-Year Cost
Community Relationships	CMR-9	VRWJPO Watershed Tours	Host watershed tours for stakeholders to highlight demonstrations of innovative technology, successful water quality and quantity improvement projects, and restoration and enhancement activities	Medium	Consistently communicate and promote the work of the VRWJPO with partners and stakeholders. Grow the amount of watershed stakeholders.	Elected and appointed officials	LGUs, state agencies, environmental organizations	General Fund	Public Communications, Outreach and Public Relations	$53,456
	CMR-10	Project Signage	Post signage that directs stakeholders and the public to the Project Update landing page for on-going projects. Place interpretive signs at completed VRWJPO project sites to inform the public about what the projects do for water resources.	Low	Consistently communicate and promote the work of the VRWJPO with partners and stakeholders.	Many	LGUs	General Fund	Public Communications, Outreach and Public Relations	$7,000
Administration	AD-1	Staffing	Staffing for VRWJPO Administrator, Co-Administrator, Senior Watershed Specialist, Water Resources Engineer and Communications and Outreach Specialist for hours related to: Administration and Operations; Planning; Inventory, Assessment, Research; Feasibility/Preliminary Engineering; Regulation; and CIP and Maintenance.	High	Many	N/A	Dakota County, Scott County	General Fund	All Budget Categories minus Public Communications, Outreach and Public Relations	$5,944,337
	AD-2	Insurance	Fees associated with insurance required for operation of the VRWJPO.	High	N/A	N/A	N/A	General Fund	Administration and Operations	$51,586
	AD-3	Legal Support	Fees associated with legal support for contract and/or agreement establishment, bidding document review and other legal support.	High	N/A	N/A	Dakota County	General Fund	Administration and Operations	$286,597
	AD-4	Public Notices	Keep website updated on following information: JPB agendas, meeting packets and meeting minutes; CAC agendas, meeting packets and meeting minutes; the Watershed Management Plan; VRWJPO Standards; monitoring reports; annual reports; legal public notices.	High	N/A	N/A		General Fund	Administration and Operations	$53,456

Table 3-14: VRWJPO 2026-2035 Implementation Plan: 10-Year Expenses

Category	Item ID	Action	Description	Priority Level	Objective(s) Addressed	Target Resource/Audience	Partners	Funding Source	Budget Category	*Total 10-Year Cost
Administration	AD-5	Watershed Management Plan Update	Funds to hire a contractor to update the Plan following MN Rule 103B and MN Statute 8410 requirements.	High	N/A	N/A	Dakota County and Scott County	General Fund	Planning	$195,000
	AD-6	CIP Maintenance	Funding for maintenance of CIP projects completed through partnerships with LGUs or independently by the VRWJPO.	High	Many	N/A	LGUs	General Fund	CIP and Maintenance	$343,916
	AD-7	Miscellaneous Operational Costs	Funding for miscellaneous operational costs including, but not limited to: website technical support, webpage host, software licenses, public notices, tools, equipment, subscriptions, communication materials, clothing, CAC per diems, trainings and mileage reimbursements.	High	Many	N/A	N/A	General Fund	Administration and Operations	$150,000

Notes:

(*) Dollars shown reflect only those costs sourced from the VRWJPO general budget. If funding source identifies grants or partner funds, additional dollars would be needed for full project implementation. VRWJPO general budget expenditures have been accounted for as partners have identified action within 2-, 5- or 10-year CIP programs, or other long-range implementation plans. Generally, for CIP partnerships, VRWJPO contributions range from 10-25% of full project cost.

(+) Currently, no funding from the VRWJPO is identified to support this action. This action may be completed as partnership and/or grant funding becomes available.

	Total 10-Year Cost
Water Quality Total	$2,746,136
Stormwater Management Total	$571,000
Groundwater Sustainability Total	$93,000
Climate Resilience Total	$346,000
Natural Environments Total	$805,267
Community Relationships Total	$1,881,843
Administration Total	$7,024,894
Total	$13,468,141

Table 3-15: VRWJPO 2026-2035 Implementation Plan: Annual Expenses

Category	Item ID	Action	Target Resource/Audience	Partners	Funding Source	Budget Category	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Water Quality	WQ-1	Vermillion River Monitoring Network	Watershed-wide	DCSWCD, SSWCD, DNR, MPCA	General Fund	Inventory, Assessment and Research	$107,000	$110,210	$113,516	$116,922	$120,429	$124,042	$127,764	$131,597	$135,544	$139,611
	WQ-2	Assessments	Watershed-wide	Many	General Fund, Grants	Inventory, Assessment and Research						$35,000				
	WQ-3	Projects Identified within City of Lakeville North Creek and East Lake Subwatershed Assessment	North Creek and East Lake	City of Lakeville	General Fund, Partner Funds, Grants	CIP and Maintenance			$60,000	$60,000					$30,000	$30,000
	WQ-4	Projects Identified within City of Apple Valley East Lake Subwatershed Assessment	East Lake	City of Apple Valley	General Fund, Partner Funds, Grants	CIP and Maintenance		$57,500	$57,500	$115,000	$115,000					
	WQ-5	Projects Identified within Vermillion River Headwaters Subwatershed Assessment Projects	Vermillion River Headwaters	SSWCD, Landowners	Grants, Partner Funds	CIP and Maintenance	$8,750	$9,013	$9,283	$9,561	$9,848	$10,144	$10,448	$10,761	$11,084	$11,417
	WQ-6	Projects Identified within Upper Mainstem Subwatershed Assessment	Upper Mainstem Subwatershed	Landowners, DCSWCD	Grants, Partner Funds	CIP and Maintenance	$27,500	$28,325	$29,175	$30,050	$30,951	$31,880	$32,836	$33,822	$34,836	$35,881

Table 3-15: VRWJPO 2026-2035 Implementation Plan: Annual Expenses

Category	Item ID	Action	Target Resource/Audience	Partners	Funding Source	Budget Category	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Water Quality	WQ-7	Projects Identified within South Branch Vermillion River Subwatershed Assessment	South Branch Subwatershed	Landowners, DCSWCD	Grants, Partner Funds	CIP and Maintenance	$8,750	$9,013	$9,283	$9,561	$9,848	$10,144	$10,448	$10,761	$11,084	$11,417
	WQ-8	Projects Identified within Vermillion Lower Mainstem South Subwatershed Assessment	Lower Mainstem Subwatershed	Landowner, DCSWCD	Grants, Partner Funds	CIP and Maintenance	$8,750	$9,013	$9,283	$9,561	$9,848	$10,144	$10,448	$10,761	$11,084	$11,417
	WQ -9	Opportunity projects/assessments	Watershed-wide	Many	General Fund, Partner Funds, Grants	All Budget Categories excluding Administration and Operations	$8,000									
	WQ-10	BMP Performance Monitoring	Watershed-wide	Many	General Fund	Inventory, Assessment and Research	$2,000		$2,200	$2,300	$2,400	$2,500	$2,700	$2,800	$2,900	$3,000
	WQ-11	Vermillion River Groundwater Interaction Assessment	South Branch, Lower Mainstem and Mississippi Direct Subwatersheds	Dakota County, City of Hastings	General Fund, Partner Funds, Grants	Inventory, Assessment and Research									$49,400	
	WQ-12	Groundwater Quality Projects, Programs and Practices	Watershed-wide	Many	General Fund, Partner Funds	CIP and Maintenance	$17,500	$18,025	$18,566	$19,123	$19,696	$20,287	$20,896	$21,523	$22,168	$22,834
	WQ-13	Enhanced Street Sweeping Study	Regulated MS4s	Dakota County	General Fund, Partner Funds	Inventory, Assessment and Research; and Communication, Outreach and Public Relations	$45,000									

Table 3-15: VRWJPO 2026-2035 Implementation Plan: Annual Expenses

Category	Item ID	Action	Target Resource/Audience	Partners	Funding Source	Budget Category	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Water Quality	WQ-14	Assist with Development of Low Salt Design Standards	Watershed-wide	Many	General Fund	Administration and Operations; Regulation		$5,000				$5,000				
	WQ-15	Projects that Address E. coli	Upper Mainstem Subwatershed	DCSWCD, SSWCD, Dakota County, Scott County	General Fund, Partner Funds	Inventory, Assessment and Research	$7,500									
	WQ-16	Projects that Address Toxics/Metals/ECOC/Pesticides	Watershed-wide	Many	General Fund, Partner Fund, Grants	CIP and Maintenance; Inventory, Assessment and Research; and Communication, Outreach and Public Relations	Currently, no funding identified. This action may be completed as partnerships and funding become available.									
Stormwater Management	SW-1	Projects Identified within Hastings Direct Drainage Subwatershed Assessment	Lower Mississippi Direct Subwatershed	City of Hastings	Grants, Partner Funds	CIP and Maintenance		$25,000			$50,000		$55,000			
	SW-2	Projects Identified within South Creek Subwatershed Assessment	South Creek Subwatershed	City of Lakeville, Landowners, Dakota County	General Fund, Partner Funds, Grants	CIP and Maintenance					$10,000		$10,000		$10,000	
	SW-3	Projects Identified within City of Farmington Subwatershed Assessment	North Creek, Middle Creek and Middle Mainstem Subwatersheds	City of Farmington	General Fund, Partner Funds, Grants	CIP and Maintenance						$75,000				

Table 3-15: VRWJPO 2026-2035 Implementation Plan: Annual Expenses

Category	Item ID	Action	Target Resource/Audience	Partners	Funding Source	Budget Category	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Stormwater Management	SW-4	Projects Identified within City of Farmington Stormwater Retrofit Assessment for Independent School District 192	North Creek, Middle Creek and Middle Mainstem Subwatersheds	City of Farmington	General Fund, Partner Funds, Grants	CIP and Maintenance	Currently, no funding identified. This action may be completed as partnerships and funding become available.									
	SW-5	Innovative Stormwater Management Projects and Practices	Watershed-wide	Cities, Dakota County, Scott County	General Fund, Partner Funds, Grants	CIP and Maintenance		$65,000	$65,000				$70,000	$70,000		
	SW-6	Opportunity projects/assessments	Watershed-wide	Many	General Fund, Partner Funds, Grants	All Budget Categories excluding Administration and Operations	$8,000									
	SW-7	Projects identified within the Long and Farquar TMDL Implementation Plan and Long and Farquar Pond Feasibility Analysis	Long and Farquar Lakes	City of Apple Valley	General Fund, Partner Funds, Grants	CIP and Maintenance	$18,000					$40,000				
	SW-8	Low Impact Development Practice Policies and Programs	Urban and Suburban Landscapes	Many	General Fund	Many	Currently, no funding identified. This action may be completed as partnerships and funding become available.									
Groundwater Sustainability	GS-1	Groundwater Conservation Assessments	Watershed-wide	Many	General Fund	Inventory, Assessments and Research			$10,000							
	GS-2	Projects, Programs and Practices Identified within the Dakota County Groundwater Plan's Groundwater Quantity Tactics	Dakota County	Dakota County, LGUs, DCSWCD	General Fund, Grants, Partner Funds	CIP and Maintenance; Regulation; Inventory, Assessments and Research	$7,500	$7,500	$7,500	$7,500	$7,500	$7,500	$7,500	$7,500	$7,500	$7,500

Table 3-15: VRWJPO 2026-2035 Implementation Plan: Annual Expenses

Category	Item ID	Action	Target Resource/Audience	Partner(s)	Funding Source(s)	Budget Category	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Groundwater Sustainability	GS-3	Groundwater Conservation Assessment Projects	Watershed-wide	Many	General Fund, Grants, Partner Funds	CIP and Maintenance	Currently, no funding identified. This action may be completed as partnerships and funding become available.									
	GS-4	Soil Health Initiative Partnerships	Urban and Suburban Landscapes	Many	General Fund, Grants, Partner Funds	CIP and Maintenance; Communications, Outreach and Public Relations	Currently, no funding identified. This action may be completed as partnerships and funding become available.									
	GS-5	Opportunity projects/assessments	Watershed-wide	Many	General Fund, Partner Funds, Grants	All Budget Categories excluding Administration and Operations	$8,000									
Climate Resilience	CR-1	Climate Resiliency Plan	Watershed-wide	Many	General Fund, Grants	Feasibility/ Preliminary Engineering; Inventory, Assessment and Research			$50,000	$50,000						
	CR-2	Climate Resilient Project Incentives	Urban and Suburban Landscapes	Cities, Counties, SWCDs	General Fund, Partner Funds, Grants	CIP and Maintenance						$25,000	$40,000	$28,000	$35,000	$25,000
	CR-3	Floodplain Reconnection	Watershed-wide	Many	General Fund, Partner Funds, Grants	CIP and Maintenance; Feasibility/ Preliminary Engineering				$20,000				$35,000		

Table 3-15: VRWJPO 2026-2035 Implementation Plan: Annual Expenses

Category	Item ID	Action	Target Resource/Audience	Partner(s)	Funding Source(s)	Budget Category	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Climate Resilience	CR-4	Opportunity projects/assessments	Watershed-wide	Many	General Fund, Partner Funds, Grants	All Budget Categories excluding Administration and Operations	$8,000									
	CR-5	Stormwater Infrastructure Adaptation	Urban and Suburban Landscapes	LGUs	General Fund, Partner Funds, Grants	CIP and Maintenance					$15,000				$15,000	
	CR-6	Green Infrastructure BMPs	Urban and Suburban Landscapes	LGUs	General Fund, Partner Funds, Grants	CIP and Maintenance	Currently, no funding identified. This action may be completed as partnerships and funding become available.									
	CR-7	Updated Floodplain Model	Watershed-wide	Cities, Counties, DNR	General Fund, Partner Funds	Feasibility/Preliminary Engineering	Currently, no funding identified. This action may be completed as partnerships and funding become available.									
Natural Environments	NE-1	Projects identified within the South Creek Geomorphic Assessment	South Creek Subwatershed	City of Lakeville, Dakota County	Grants, Partner Funds	CIP and Maintenance		$50,000	$35,000							
	NE-2	Projects identified within the Etter Creek and Ravenna Coulee Geomorphic Assessment	Mississippi Direct Subwatershed	Dakota County, DCSWCD	Grants, Partner Funds	CIP and Maintenance				$10,000						
	NE-3	Projects identified within the Middle and North Creek Geomorphic Assessment	Middle Creek and North Creek Subwatersheds	City of Lakeville, City of Farmington, Dakota County	Grants, Partner Funds	CIP and Maintenance							$45,000			

Table 3-15: VRWJPO 2026-2035 Implementation Plan: Annual Expenses

Category	Item ID	Action	Target Resource/ Audience	Partner(s)	Funding Source(s)	Budget Category	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Natural Environments	NE-4	Projects identified within the Empire Drainages Geomorphic Assessment	Middle Mainstem Subwatershed	City of Empire, DCSWCD	Grants, Partner Funds	CIP and Maintenance								$20,000		
	NE-5	Projects identified within the Lower Mainstem Geomorphic Assessment	Lower Mainstem Subwatershed	Dakota County, DCSWCD	Grants, Partner Funds	CIP and Maintenance								$20,000		
	NE-6	VRWJPO Wetland Banking Program	Restorable Wetlands	SWCDs, Counties, BWSR	General Fund, Partner Funds, Grants	CIP and Maintenance	Currently, no funding identified. This action may be completed as partnerships and funding become available.									
	NE-7	Priority Wetland Restoration	Restorable Wetlands	Many	General Fund, Partner Funds	CIP and Maintenance				$25,000		$35,000				$45,000
	NE-8	East Lake In-lake Projects and Practices	East Lake	City of Apple Valley, City of Lakeville, DNR, Dakota County	General Fund, Partner Funds, Grants	CIP and Maintenance	$10,000	$5,000	$5,000			$25,000				
	NE-9	Cost-share for DCSWCD and SSWCD Incentive Programs	Agricultural landscapes	DCSWCD and SSWCD	General Fund	CIP and Maintenance	$23,750	$24,463	$25,196	$25,952	$26,731	$27,533	$28,359	$29,210	$30,086	$30,988
	NE-10	In-stream Habitat Restoration	Streams	Many	General Fund, Grants, Partner Funds	CIP and Maintenance		$15,000			$50,000		$37,500	$62,500		$25,000

Table 3-15: VRWJPO 2026-2035 Implementation Plan: Annual Expenses

Category	Item ID	Action	Target Resource/Audience	Partner(s)	Funding Source(s)	Budget Category	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Natural Environments	NE-11	Opportunity projects/assessments	Watershed-wide	Many	Many	All Budget Categories excluding Administration and Operations	$8,000									
	NE-12	In-lake management projects identified within the Long and Farquar TMDL Implementation Plan	Long and Farquar Lakes	DNR and City of Apple Valley	Grants, Partner Funds, General Fund	CIP and Maintenance	Currently, no funding identified. This action may be completed as partnerships and funding becomes available.									
	NE-13	Upland Restoration Adjacent to Water Resources	Watershed-wide	Many	Grants, Partner Funds, General Fund	Public Communications, Outreach and Public Relations; CIP Maintenance	$2,500	$2,500								
Community Relationships	CMR-1	Stewardship Grants	Residents, landowners, businesses, community groups	Many	General Fund	Public Communications, Outreach and Public Relations; Administration and Operations	$32,650	$33,033	$33,434	$33,856	$34,299	$34,764	$35,252	$35,764	$36,303	$36,868
	CMR-2	Public Event Participation	Many	Many	General Fund	Public Communications, Outreach and Public Relations	$7,650	$8,033	$8,434	$8,856	$9,299	$9,764	$10,252	$10,764	$11,303	$11,868
	CMR-3	Maintain Website	Many	N/A	General Fund	Public Communications, Outreach and Public Relations	$4,250	$4,463	$4,686	$4,920	$5,166	$5,424	$5,695	$5,980	$6,279	$6,593

Table 3-15: VRWJPO 2026-2035 Implementation Plan: Annual Expenses

Category	Item ID	Action	Target Resource/Audience	Partner(s)	Funding Source(s)	Budget Category	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Community Relationships	CMR-4	Distribute Newsletter	Newsletter subscribers	Many	General Fund	Public Communications, Outreach and Public Relations	$6,800	$7,140	$7,497	$7,872	$8,265	$8,679	$9,113	$9,568	$10,047	$10,549
	CMR-5	Partner Programs	Watershed-wide	Many	General Fund	Public Communications, Outreach and Public Relations	$78,500	$80,855	$83,281	$85,779	$88,352	$91,003	$93,733	$96,545	$99,441	$102,425
	CMR-6	Social Media Presence	Many	Many	General Fund	Public Communications, Outreach and Public Relations	$11,050	$11,603	$12,183	$12,792	$13,431	$14,103	$14,808	$15,548	$16,326	$17,142
	CMR-7	Collaborative Education and Outreach	Residents, landowners, businesses	LGUs	General Fund	Public Communications, Outreach and Public Relations	$9,350	$9,818	$10,308	$10,824	$11,365	$11,933	$12,530	$13,156	$13,814	$14,505
	CMR-8	Engagement with Schools in the Watershed	Students	DCSWCD and SSWCD	General Fund	Public Communications, Outreach and Public Relations	$7,250	$7,463	$7,686	$7,920	$8,166	$8,424	$8,695	$8,980	$9,279	$9,593
	CMR-9	VRWJPO Watershed Tours	Elected and appointed officials	LGUs; state, local and regional agencies	General Fund	Public Communications, Outreach and Public Relations	$4,250	$4,463	$4,686	$4,920	$5,166	$5,424	$5,695	$5,980	$6,279	$6,593
	CMR-10	Project Signage	Many	LGUs	General Fund	Public Communications, Outreach and Public Relations	$500	$500	$500	$500		$500	$500	$500	$500	$3,000

Table 3-15: VRWJPO 2026-2035 Implementation Plan: Annual Expenses

Category	Item ID	Action	Target Resource/Audience	Partner(s)	Funding Source(s)	Budget Category	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Administration	AD-1	Staffing	N/A	Dakota County, Scott County	General Fund	All Budget Categories minus Public Communications, Outreach and Public Relations	$472,602	$496,232	$521,044	$547,096	$574,451	$603,173	$633,332	$664,998	$698,248	$733,161
	AD-2	Insurance	N/A	N/A	General Fund	Administration and Operations	$4,500	$4,635	$4,774	$4,917	$5,065	$5,217	$5,373	$5,534	$5,700	$5,871
	AD-3	Legal Support	N/A	Dakota County	General Fund	Administration and Operations	$25,000	$25,750	$26,523	$27,318	$28,138	$28,982	$29,851	$30,747	$31,669	$32,619
	AD-4	Public Notices	N/A	N/A	General Fund	Administration and Operations	$4,250	$4,463	$4,686	$4,920	$5,166	$5,424	$5,695	$5,980	$6,279	$6,593
	AD-5	Watershed Management Plan Update	N/A	Dakota County and Scott County	General Fund	Planning									$95,000	$100,000
	AD-6	CIP Maintenance	N/A	LGUs	General Fund	CIP and Maintenance	$30,000	$30,900	$31,827	$32,782	$33,765	$34,778	$35,822	$36,896	$38,003	$39,143
	AD-7	Miscellaneous Operational Costs	N/A	N/A	General Fund	Administration and Operations	$15,000	$15,000	$15,00	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000

Note:
Annual dollar expenditures reflect only those costs sourced from the VRWJPO general budget. If funding source identifies grants or partner funds, additional dollars would be needed for full project implementation. VRWJPO general budget expenditures have been accounted for as partners have identified action within 2-, 5- or 10-year CIP programs, or other long-range implementation plans. Generally, for CIP partnerships, VRWJPO contributions range from 10-25% of full project cost.

	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Water Quality Total	$240,750	$246,098	$308,805	$372,079	$318,022	$249,141	$215,540	$222,025	$308,102	$265,576
Stormwater Management Total	$26,000	$90,000	$65,000	$0	$60,000	$115,000	$135,000	$70,000	$10,000	$0
Groundwater Sustainability Total	$15,500	$7,500	$17,500	$7,500	$7,500	$7,500	$7,500	$7,500	$7,500	$7,500
Climate Resilience Total	$8,000	$0	$50,000	$70,000	$15,000	$25,000	$40,000	$63,000	$50,000	$25,000
Natural Environments Total	$44,250	$96,963	$65,196	$60,952	$76,731	$87,533	$110,859	$131,710	$30,086	$100,988
Community Relationships Total	$162,250	$167,368	$172,694	$178,238	$183,509	$190,018	$196,273	$202,787	$209,571	$219,136
Administration Total	$551,352	$576,980	$603,853	$632,033	$661,584	$692,574	$725,073	$759,156	$889,900	$932,388
Total	$1,048,102	$1,184,907	$1,283,048	$1,320,802	$1,322,346	$1,366,765	$1,430,245	$1,456,178	$1,505,159	$1,550,588

3.6 Plan Reporting and Assessment

Following MN Rule 8410.0150, the VRWJPO submits an annual activity and audit report to the BWSR. The annual report must include the following content:

- A list of the VRWJPO's board members, names of designated officers, the governmental organization that each board member represents, and the county that appointed each member
- Identification of a contact person capable of answering questions about the VRWJPO including postal and electronic mailing address and telephone number
- An assessment of the previous year's annual work plan that indicates whether the stated activities were completed including the expenditures of each activity with respect to the approved budget, unless included in the audit report
- A work plan and budget for the current year specifying which activities will be undertaken
- An evaluation of progress on goals and the implementation actions, including the CIP, to determine if amendments to the implementation actions are necessary
- A summary of significant trends of monitoring data
- A copy of the annual communication
- The VRWJPO's activities related to the biennial solicitations for interest proposals for legal, professional or technical consultant services
- And evaluation of the status of local water plan adoption and local implementation activities
- The status of any locally adopted ordinances or rules required by the VRWJPO and their enforcement
- A summary of the permits and variances issues or denied and violations under rule or ordinance requirements of the VRWJPO

Staff present these items in the following formats within the annual report:

- Tables and graphs showing monitoring trends in the reporting and subsequent monitoring years as they relate to biological and chemical parameters in lakes and rivers
- Tables narrating projects implemented, organized according to specific goal and implementation actions, and their associated pollutant reductions, project costs, grant funding, partnering communities, and subwatershed location
- Metrics of groundwater conservation and protection activities, logged according to urban and agricultural sources
- Tables narrating stormwater adaptation projects implemented, organized according to project type, and their associated volume reductions, project cost, grant funding, partnering communities, and subwatershed location
- Community engagement metrics including those associated with: the number of participants engaged at various community outreach events (volunteer programs, workshops, events and presentations)
- A final treasurer's report for the reporting year, logged according to projects implemented and budget funding sources
- Work plan activities planned for the following year as well as the corresponding budgeting amounts, organized according to Watershed Plan categories

- Resolutions made by the JPB in the reporting year, organized according to meeting date

The annual report described above is submitted to BWSR in accordance with MN Rule 103B.231 and MN Statute 8410.0150. In addition to producing the annual report, the VRWJPO tracks measurable outcomes relating to specific implementation actions. The way these outcomes are assessed are described *within Table 3-16.*

Table 3-16: Measurable Outcomes

Category	Item ID	Action	Measurable Outcomes
Water Quality	WQ-1	Vermillion River Monitoring Network	• 1 Annual Monitoring Report
	WQ-2	Assessments	• Assessments: Up to 3
	WQ-3	Projects Identified within City of Lakeville North Creek and East Lake Subwatershed Assessment	• Projects: Up to 4 • TSS Removal: Up to 11,200 lbs/yr • TP Removal: Up to 40.7 lbs/yr
	WQ-4	Projects Identified within City of Apple Valley East Lake Subwatershed Assessment	• Projects: Up to 2 • TP Removal: Up to 101 lbs/yr
	WQ-5	Projects Identified within Vermillion River Headwaters Subwatershed Assessment Projects	• Projects: Up to 10 • TSS Reduction: Up to 509.9 tons/yr • TP Reduction: Up to 193.3 lbs/yr • NO3 Reduction: Up to 1,889.24lbs/yr
	WQ-6	Projects Identified within Upper Mainstem Subwatershed Assessment	• Projects: Up to 4 • TSS Reduction: Up to 46 tons/yr
	WQ-7	Projects Identified within South Branch Vermillion River Subwatershed Assessment	• Projects: Up to 9 • TSS Reduction: Up to 583 tons/yr
	WQ-8	Projects Identified within Vermillion Lower Mainstem South Subwatershed Assessment	• Projects: Up to 9 • TSS Reduction: Up to 31.95 tons/yr
	WQ -10	Opportunity Projects/assessments	• Projects: Up to 2
	WQ-11	BMP Performance Monitoring	• BMPs Evaluated: Up to 3
	WQ-12	Vermillion River Groundwater Interaction Assessment	• Report: 1
	WQ-13	Groundwater Quality Projects, Programs and Practices	• Projects: Up to 5
	WQ-14	Enhanced Street Sweeping Study	• Report: 1
	WQ-15	Assist with Development of Low Salt Design Standards	• Collaborative Interactions: Up to 5
	WQ-16	Projects that Address E. coli	• Projects: Up to 1
	WQ-17	Projects that Address Toxics/Metals/ECOC/Pesticides	• Projects: Up to 1

Table 3-16: Measurable Outcomes Continued

Category	Item ID	Action	Measurable Outcomes
Stormwater Management	SW-1	Projects Identified within Hastings Direct Drainage Subwatershed Assessment	• Projects: Up to 3 TSS Reductions: Up to 2.22 tons/yr • TP Removal: Up to 6.7 lbs/yr
	W-2	Projects Identified within South Creek Subwatershed Assessment	• Projects: Up to 3 • TSS Reductions: Up to 7,920 lbs/yr
	SW-3	Projects Identified within City of Farmington Subwatershed Assessment	• Projects: Up to 1 • TSS Reductions: Up to 16.9 lbs/yr
	SW-4	Projects Identified within City of Farmington Stormwater Retrofit Assessment for Independent School District 192	To be identified as funding becomes available.
	SW-5	Innovative Stormwater Management Projects and Practices	• Projects: Up to 2
	SW-6	Opportunity Projects/assessments	• Projects: Up to 2
	SW-7	Projects identified within the Long and Farquar TMDL Implementation Plan and Long and Farquar Pond Feasibility Analysis	• Projects: Up to 1 • TP Removal: Up to 8.04 lb/yr
	SW-8	Low Impact Development Practice Policies and Programs	• Collaborative Interactions: Up to 2
Groundwater Sustainability	GS-1	Groundwater Conservation Assessments	• Assessments: Up to 3
	GS-2	Projects, Programs and Practices Identified within the Dakota County Groundwater Plan's Groundwater Quantity Tactics	• Projects: Up to 5
	GS-3	Groundwater Conservation Assessment Projects	• Projects: Up to 3
	GS-4	Soil Health Initiative Partnerships	• Projects: Up to 5
	GS-5	Opportunity Projects/assessments	• Projects: Up to 2
Climate Resilience	CR-1	Climate Resiliency Plan	• Plan: Up to 1
	CR-2	Climate Resilient Project Incentives	• Projects: Up to 5
	CR-3	Floodplain Reconnection	• Projects: Up to 2
	CR-4	Opportunity Projects/assessments	• Projects: Up to 2
	CR-5	Stormwater Infrastructure Adaptation	• Projects: Up to 3

Table 3-16: Measurable Outcomes Continued

Category	Item ID	Action	Measurable Outcomes
Climate Resilience	CR-6	Green Infrastructure BMPs	• Projects: Up to 1
	CR-7	Updated Floodplain Model	• Updated Model: Up to 1
Natural Environments	NE-1	Projects identified within the South Creek Geomorphic Assessment	• Projects: Up to 1
	NE-2	Projects identified within the Etter Creek and Ravenna Coulee Geomorphic Assessment	• Projects: Up to 1
	NE-3	Projects identified within the Middle and North Creek Geomorphic Assessment	• Projects: Up to 1
	NE-4	Projects identified within the Empire Drainages Geomorphic Assessment	• Projects: Up to 1
	NE-5	Projects identified within the Lower Mainstem Geomorphic Assessment	• Projects: Up to 1
	NE-6	VRWJPO Wetland Banking Program	• Projects: Up to 1 • ~80 acres wetland restored
	NE-7	Priority Wetland Restoration	• Project: Up to 2 • TP Removal: Up to 1,320 lbs/yr
	NE-8	East Lake In-lake Projects and Practices	• Projects: Up to 3
	NE-9	Cost-share for DCSWCD and SSWCD Incentive Programs	• Projects: Up to 35 • TSS Reductions: Up to 502 tons/yr • TP Reductions: Up to 586 lbs/yr • NO3 Reductions: Up to 12,295 lbs/yr
	NE-10	In-stream Habitat Restoration	• Projects: Up to 2
	NE-11	Opportunity Projects/assessments	• Projects: Up to 2
	NE-12	In-lake Management Projects Identified within the Long and Farquar TMDL Implementation Plan	To be identified as funding becomes available.
	NE-13	Upland Restoration Adjacent to Water Resources	• Projects: Up to 5

Table 3-16: Measurable Outcomes Continued

Category	Item ID	Action	Measurable Outcomes
Community Relationships	CMR-1	Stewardship Grants	• Applications: Up to 10
	CMR-2	Public Event Participation	• Events: Up to 120
	CMR-3	Maintain Website	• Website Views: Up to 195,000
	CMR-4	Distribute Newsletter	• Electronic newsletters: Up to 40
	CMR-5	Partner Programs	• Landscaping for Clean Water Projects: Up to 160 • Lawns Reimagined Projects: Up to 20
	CMR-6	Social Media Presence	• Social Media Posts: Up to 2,900
	CMR-7	Collaborative Education and Outreach	• Community Organization Presentations: Up to 20
	CMR-8	Engagement with Schools in the Watershed	• Classroom Presentations: Up to 10
	CMR-9	VRWJPO Watershed Tours	• Tours: Up to 5
	CMR-10	Project Signage	• Number of Signs: Up to 15
Administration	AD-1	Staffing	• 4 full-time staff, 1 part-time staff
	AD-2	Insurance	N/A
	AD-3	Legal Support	N/A
	AD-4	Public Notices	N/A
	AD-5	Watershed Management Plan Update	• Plan Update: 1
	AD-6	CIP Maintenance	N/A
	AD-7	Miscellaneous Operational Costs	N/A

Section Four: Watershed Financing

The VRWJPO annually allocates funding for fixed and variable costs to accomplish Watershed administration and the goals and objectives detailed in the Plan. The four primary revenue streams include:

- Property Tax Levy
- Wetland Banking Program
- Grant Funding
- Partner Cost-Share

Budget appropriations cover fixed costs for Administration and Operations, which includes but is not limited to, maintaining appropriate levels of VRWJPO staff, staff training, office space and supplies, equipment, and other overhead costs. Budget appropriations for Planning, Inventory/Assessment/Research, Feasibility/Preliminary Engineering, Regulation, Communication/Outreach/Public Relations, and Capital Improvement Projects/Maintenance are more variable.

4.1 Property Tax Levy

In accordance with MN Statute 103B.253, the VRWJPO has established a Watershed Management Tax District, and a levy is collected by Dakota and Scott Counties from properties within the District to pay for projects, programs, and practices identified in an approved and adopted Watershed Management Plan to:

1) Protect, preserve, and use natural surface water and groundwater storage and retention systems;
2) Minimize public capital expenditures needed to correct flooding and water quality problems;
3) Identify and plan for means to effectively protect and improve surface water and groundwater quality;
4) Establish more uniform local policies and official controls for surface water and groundwater management;
5) Prevent erosion of soil into surface water systems;
6) Promote groundwater recharge;
7) Protect and enhance fish and wildlife habitat and water recreational facilities; and
8) Secure the other benefits associated with the proper management of surface water and groundwater.

The majority of the VRWJPO's revenue comes from the tax levy. Over the years, the levy has increased steadily, to help offset inflation and other service cost increases, apart from 2020-2024 when the annual levy was the same. Levy amounts dating back to 2016 are listed below.

Table 4-1: 2016- 2025 Tax Levy Annual Revenue

Year	Dakota County	Scott County	Total
2016	$821,140	$31,460	$852,600
2017	$861,700	$33,500	$895,200
2018	$887,900	$34,100	$922,000
2019	$912,900	$35,100	$948,000
2020	$966,000	$34,000	$1,000,000
2021	$966,650	$33,350	$1,000,000
2022	$967,500	$32,500	$1,000,000
2023	$964,900	$35,100	$1,000,000
2024	$965,600	$34,400	$1,000,000
2025	$990,832	$36,050	$1,026,882

4.2 Wetland Banking Program

The VRWJPB prioritized offsetting wetland impacts and no net loss of wetlands within the VRWJPO and established a policy to address this priority. Based on United States Army Corps of Engineers (USACE) and BWSR wetland regulations, when wetlands are impacted the preferred method to offset those impacts is to purchase credits from an approved wetland bank rather than attempting on-site wetland mitigation, which has historically had poor restoration success. A wetland bank is a successfully restored wetland where the acres of wetland restored and approved by the USACE and BWSR are sold on the open market as credits for wetland impact elsewhere.

The VRWJPO invests in the restoration of wetlands in the VRWJPO in partnership with LGUs, the SWCDs, or the BWSR for the creation of VRWJPO-managed wetland banks.

Initially, the proceeds from wetland credit sales are used to pay down any wetland banking design, construction, vegetation establishment and easement costs. Remaining proceeds are then set aside in a revolving fund for future wetland restoration or banking projects.

The first wetland restoration, funded in part by the VRWJPO, was constructed in 2021. At this time, the VRWJPO contributed $500,000 towards the cost of restoration, which resulted in the creation of 35.42 acres of credit available for purchase on the wetland market. The following table indicates the amount of proceeds generated from the sale of wetland bank credits through mid-2024. The VRWJPO, DCSWCD, and the BWSR are currently partnering to establish another VRWJPO-managed wetland bank that will generate an estimated 30 credits.

Table 4-2: VRWJPO Wetland Bank Credit Sales

Date Withdrawn	Credits Withdrawn (Acres)	Cost
6/7/2022	0.1600	$5,920.00
7/19/2022	2.812	$104,044.00
9/14/2022	0.2478	$9,168.60
10/18/2022	0.9800	$36,260.00
7/17/2024	0.9300	$34,410.00
5/29/2024	0.8800	$32,560.00
10/15/2024	0.1200	$4,440.00
01/07/2025	0.5800	$28,922.86
04/16/2025	1.1408	$56,888.27
04/16/2025	0.0988	$4,926.86
05/20/2025	0.3230	$16,107.04
06/12/2025	0.3060	$15,259.30
06/17/2025	0.2500	$12,466.75
Pending Sale	0.3790	$18,899.59
Pending Sale	1.0400	$51,861.68
Total	**10.2474**	**$432,134.96**

4.3 Grant Funding

The VRWJPO has procured $6.53 million in grant funding between 2016 and 2025. These funds have helped the VRWJPO and its partners implement projects to improve impaired waters, protect water resources that are meeting state water quality standards, enhancement of fish and wildlife habitat, protection of groundwater quality and quantity, and more. The most awarded grants received by the VRWJPO are those funded through the Clean Water, Land, and Legacy Amendment such as:

- **Clean Water Fund Competitive Grants through the BWSR (CWF):** CWF Grants are awarded to projects that restore, protect, and enhance water quality in lakes, rivers and streams; protect groundwater from degradation; and protect drinking water sources. Applying for and receiving awards is has historically been offered annually through a statewide competitive grant application process, thought that process changed to biennially in 2025. However, funding appropriations for the CWF Grant may change over the course of this plan, as Minnesota transitions to its watershed management approach. As watershed-based plans are completed, funding will gradually shift away from traditional project-by-project CWF Grants toward increased support for watershed-based grants as described below.
- **Watershed-Based Implementation Funding Grants through the BWSR:** WBIF Grants provide biennial grant funding to implement projects and programs that protect, enhance, and restore surface water quality in lakes, rivers, and streams; protect groundwater from degradation; and protect drinking water sources. The VRWJPO and LGUs have access to this funding source since the VRWJPO has an approved Watershed Management Plan and Dakota County has an approved Groundwater Plan. Every two years, partners submit funding requests based on their prioritized plan activities. This funding allows collaborating LGUs, partners, and the VRWJPO to effectively implement projects, programs and practices based on the Plan's prioritization and targeting metrics.
- **Conservation Partners Legacy Grant Program (CPL) through the Minnesota DNR:** CPL Grants fund conservation projects that restore, protect, or enhance prairies, wetlands, forests or habitat for fish, game, or wildlife in Minnesota. Grant applications are accepted every year and provide funding for a wide range of eligible projects, programs and practices identified in the Plan.
- **Outdoor Heritage Fund (OHF) through the Lessard-Sams Outdoor Heritage Council:** This grant program is similar to the CPL grant program and is where the CPL Grant program receives its allocation from but has a different application and evaluation process. The goals of the OHF grant are the restoration, protection, and enhancement of wetlands, prairies, forests, and habitat for fish, game, and wildlife.
- **Minnesota Department of Health Accelerated Implementation Grant (AIG) for Groundwater Protection:** This grant program is intended to help build capacity to accelerate the implementation of groundwater projects across the state.

Staff remain apprised of additional funding opportunities for VRWJPO initiatives.

4.4 Partner Cost-Share

Partnerships with cities, regional and state agencies, landowners, non-governmental organizations, community groups, and educational institutions help advance projects and practices within the Watershed. Since 2016, these partners have contributed $2.58 million toward initiatives aligning with the goals and objectives of the Plan. Partners have also provided cash, staff time, and/or other resources (in-kind) as described below.

During the same timeframe, the VRWJPO offered contributions totaling $3.17 million dollars from its budget to further projects and practices aligning with the goals and objectives of the Plan.

Financial contributions include:

- Grant cash matching
- Cost-share towards LGU CIP Projects and Maintenance
- The Vermillion River Watershed Stewardship Grant
- A contribution towards the Metro Children's Water Festival
- Funding towards the Minnesota Water Stewards Program
- Cost-share for urban and agricultural BMPs implemented via the DCSWCD's and SSWCD's incentive programs
- Cost-share for well decommissioning via DC's Well Sealing Grant
- Trainings on salt (Smart Salting Certification Program) and turf (Turfgrass Management Certification) best management practices
- Wetland bank establishment

In-kind contributions include:

- Grant administration
- Construction oversight for VRWJPO and/or LGU project implementation
- Dakota County CIP administration and construction oversight
- Assistance with implementation of the VRWJPO Standards and LGU permitting programs
- Hosting a learning station at DCSWCD's Outdoor Education Days

4.5 Annual Budget Adoption

The Watershed's budget is adopted annually. In general terms, the budget is developed, reviewed, and approved in the following sequence:

- Per Watershed policy, the VRWJPB will adopt the draft budget with a proposed maximum levy from each county for the following calendar year by September 1 and that amount must be certified by Dakota and Scott Counties by September 15. Other contributions or assessments from Dakota County or Scott County may be made at any time. In August, a draft VRWJPO budget and levy is developed and adopted by the VRWJPB and that levy is presented to Dakota and Scott Counties for certification.
- In early December of each year, the VRWJPB adopts a final budget and levy for the following calendar year. The proposed levy cannot exceed the amount identified in the draft budget but can be less. Dakota and Scott Counties must act and certify the final Watershed Management Tax District levy by December 28.

Appendix A: Inventory of Studies and Plans

A-1 Studies

The below list is a collection of references that were used to: formulate the information provided in the Land and Water Resources Inventory; inform implementation prioritization regimes; geographically target areas for action implementation; ensure consistency with state, regional and local planning documents.

Watershed Assessments

- Vermillion River Watershed Restoration and Protection Strategy Report – Minnesota Pollution Control Agency, 2017
- Stressor Identification Report for the Vermillion River Watershed Restoration and Protection Strategies – Wenck Associates, Inc., 2013
- Vermillion River Watershed Monitoring and Assessment Report – Minnesota Pollution Control Agency, 2018
- Vermillion River Watershed Total Maximum Daily Load Report – Minnesota Pollution Control Agency, 2015
- Vermillion River Monitoring Network Annual Report, Chemical Monitoring and Stream Gaging – Dakota County Soil and Water Conservation District, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024
- Scott County E. Coli Investigation Reports – Scott Soil and Water Conservation District, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023
- Vermillion River Watershed Monitoring and Assessment Report – Minnesota Pollution Control Agency, 2012
- Vermillion River Watershed Stressor ID Update – Minnesota Pollution Control Agency, 2022
- Vermillion River Watershed Assessment and Trends Update – Minnesota Pollution Control Agency, 2021
- DNR Watershed Health Assessment Framework

Subwatershed Assessments

- Subwatershed Analysis for the Vermillion River Headwaters – Scott Soil and Water Conservation District, 2014
- Alimagnet Lake Subwatershed Assessment Report – Wenck Associates, Inc., 2016
- South Creek Subwatershed Assessment Report – Wenck Associates, Inc., 2016
- Subwatershed Analysis for Vermillion Upper Main Stem – Dakota County Soil and Water Conservation District, 2019
- Subwatershed Analysis for South Branch Vermillion River – Dakota County Soil and Water Conservation District, 2022
- Subwatershed Analysis for Vermillion Lower Mainstem South – Dakota County Soil and Water Conservation District, 2023
- Vermillion River Headwaters Subwatershed and Stream Habitat Assessment – Scott Soil and Water Conservation District, 2025
- City of Apple Valley East Lake Subwatershed Assessment – WSB, 2022
- City of Lakeville North Creek and East Lake Subwatershed Assessment – Stantec, 2022
- North Creek and South Creek Supplemental Dissolved Oxygen Study – VRWJPO, 2022
- Vermillion River Headwaters Groundwater Recharge Area Inventory and Protection Plan – EOR, 2007

- City of Farmington Subwatershed Assessment – WSB, 2023
- Hastings Water Quality Improvement Planning – Barr, 2023
- Stormwater Retrofit Assessment for Independent School District 192 – Dakota County Soil and Water Conservation District, 2018

Geomorphic Assessments

- South Creek Subwatershed Fluvial Geomorphic Assessment Report – Interfluve, 2010
- Fluvial Geomorphic Assessment of Etter Creek and the Ravenna Coulees – Interfluve, 2011
- Fluvial Geomorphic Assessment of North Creek and Middle Creek – Interfluve, 2012
- Empire Drainages Geomorphic Assessment – Interfluve, 2013
- Lower Vermillion River Geomorphic Assessment – Interfluve, 2018
- South Branch Vermillion River: Minnesota Department of Natural Resources Geomorphic Overview – MN Department of Natural Resources, 2020

Biomonitoring

- East Lake Carp Assessment Report – Carp Solutions, 2018
- East Lake Carp Movement Study Report – Carp Solutions, 2019
- Vermillion River Watershed Fish Community Monitoring – Wenck, 2016, 2017, 2018, 2019
- Vermillion River Watershed Fish Community Monitoring – Stantec, 2020, 2021, 2022, 2023
- Vermillion River Biomonitoring Plan – Wenck, 2008

Feasibility Studies

- East Lake Common Carp Barrier Alternatives Feasibility Evaluation – Wenck, 2020
- Long and Farquar Pond Feasibility Analysis – EOR, 2023
- Alimagnet Lake Alum Treatment Feasibility Study – Barr, 2023
- Golden Pond Channel Stabilization Phase 1 – Wenck, 2016
- Long and Farquar TMDL Implementation Plan Update – EOR, 2017
- Long and Farquar Pond Feasibility Analysis – EOR, 2023
- Dakota County Rural SWMM Study – Wenck, 2020

Other Studies/Inventories

- Drained Wetland Inventory, Vermillion River Watershed Upper Vermillion and South Branch Drainage Areas – Dakota County Soil and Water Conservation District, 2012
- Potential Wetland Restoration Inventory – Dakota County Soil and Water Conservation District, 2017
- Low Salt Design Guide – Bolton & Menk, 2025
- Dakota County Groundwater Nitrate Modeling, 2022 – Barr Engineering
- Prioritized Feedlot Inventory – VRWJPO, 2019
- A Social Science-Based Assessment of Conservation Practices in the Vermillion River Watershed – University of Minnesota, 2021

A-2 Plans

Local Management Plans

- City of Apple Valley 2018-2027 Surface Water Management Plan

- City of Burnsville 2018-2027 Water Resources Management Plan
- City of Farmington 2018-2027 Surface Water Management Plan
- City of Hastings Water Management Plan
- City of Lakeville 2018-2027 Water and Natural Resources Management Plan
- City of Rosemount 2018-2027 Surface Water Management Plan
- Dakota County Rural Collaborative 2040 Comprehensive Plan: Surface Water Local Management Plan –Bolton and Menk, 2018

Regional Management Plans

- Dakota County Soil and Water Conservation District 2016-2025 Comprehensive Plan
- Scott County Soil and Water Conservation District 2018-2027 Comprehensive Plan
- Dakota County 2040 Comprehensive Plan
- Dakota County 2020-2030 Groundwater Plan
- Dakota County Agricultural Chemical Reduction Effort Plan (ACRE), 2022
- Dakota County Land Conservation Plan, 2020

State Plans

- Minnesota Nutrient Reduction Management Strategy – State of Minnesota, 2014
- Minnesota Statewide Chloride Management Plan – Minnesota Pollution Control Agency, 2020
- Minnesota Climate Action Framework – Minnesota Pollution Control Agency, 2025

Appendix B: Land and Water Resources Inventory

Background

The Vermillion River Watershed encompasses 335 square miles of rural, suburban, and urban landscapes from the river's headwaters in Scott County, crossing Dakota County to its confluence with the Mississippi River at Hastings and Red Wing, Minnesota. It is the largest watershed in the Minneapolis-St. Paul seven-county metropolitan area. Table B-1 lists each city and township, its total population, and its percentage of contributing area within the watershed. It also includes the proportion of city area within the VRWJPO, indicating whether the VRWJPO is the sole watershed organization the entity is represented by, or if there are other watershed organizations with which the city or township may partner.

This appendix provides a general analysis of physical and natural environments in the watershed, as well as trends forecasted to affect the watershed from 2026 through 2035.

Table B-1: VRWJPO City and Township Area Calculations

City/Township	*Total Population	Area in VRWJPO (Acres)	Area in VRWJPO (Miles^2)	Percent of Total VRWJPO Area	Proportion within VRWJPO Area
City of Apple Valley	47,290	9,794	15.3	4.5%	87.5%
City of Burnsville	4,610	866	1.4	0.4%	5.0%
Castle Rock Township	316	12,543	19.6	5.9%	55.7%
City of Coates	147	966	1.5	0.4%	100%
Douglas Township	296	4,902	7.7	2.3%	22.7%
Elko New Market	2,536	1,527	2.39	0.7%	72.7%
City of Empire	3,177	19,617	30.65	9.2%	100%
Eureka Township	1,093	15,232	23.80	7.1%	68.3%
City of Farmington	23,632	10,268	16.04	4.8%	100%
City of Hampton	744	808	1.27	0.3%	100%
Hampton Township	351	7,136	11.15	3.3%	32.7%
City of Hastings	22,152	7,533	11.77	3.5%	100%
City of Lakeville	58,326	20,928	32.70	9.8%	84.5%
Marshan Township	1,153	21,975	34.34	10.3%	100%
New Market Township	2,244	10,058	15.72	4.7%	100%
Nininger Township	865	10,415	16.27	4.8%	99.7%
Ravenna Township	2,354	14,043	21.94	6.6%	99.9%
City of Rosemount	25,650	22,552	35.24	10.6%	99.9%
City of Vermillion	441	635	0.99	0.3%	100%

City/Township	*Total Population	Area in VRWJPO (Acres)	Area in VRWJPO (Miles^2)	Percent of Total VRWJPO Area	Proportion within VRWJPO Area
Vermillion Township	1,290	21,806	34.07	10.2%	100%

* Total population estimated from 2020 U.S. Census data.

B-1 Land Use

Land Use Change over Time

Land use in the watershed is a story of change over time. According to the Minnesota Department of Administration State Archaeologist, people have lived in Minnesota for over 12,000 years. When people first entered North America, many areas would not have been open to human settlement due to the presence of glacial ice and large glacial lakes. However, following warming and drying climatic periods, newly uncovered land and Glacial Lake Agassiz made way for rapid re-vegetation of spruce forest and tundra grassland, providing food for woodland browsers and grassland species.

Records show that the Oneota peoples arrived in the area that is now Dakota County as early as 1000 AD. South of the VRWJPO, the Oneota lived in large villages along the river terraces of the Cannon River, cleared and cultivated land in the river bottoms, and hunted and fished in the river valley. North of the VRWJPO, the confluence of the Mississippi and Minnesota Rivers at Mendota (Oȟéyawahe, "the hill much visited," now known at Pilot Knob) has long been significant to the Dakota people.

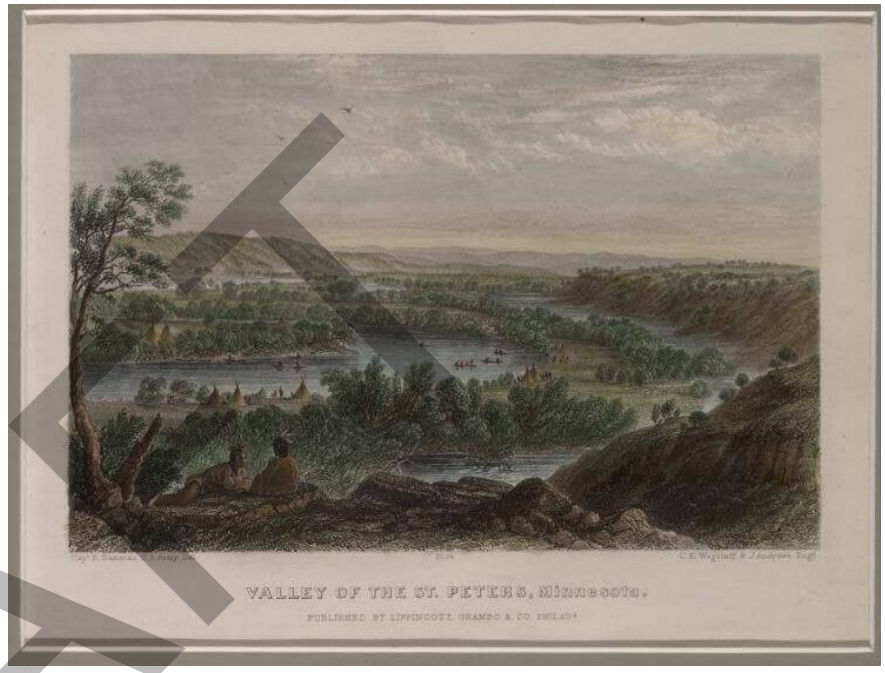


Figure B-1: Indigenous Dakota People Overlook the Minnesota River in the "Valley of St. Peters"

Source: Shakopee Mdewakanton Sioux Community

Oral history identifies the Mississippi and Minnesota River confluence as the origin of the Dakota people themselves and the center of the universe. Mendota, Mdo-te or Bdote, meaning the confluence of two rivers, was an important site for the Dakota, French fur traders, and American soldiers, including those who built Fort Snelling (Mendota Mdewakanton Dakota Tribal Community; also Peterson and Labatte). When settlers of European descent arrived, the Dakota had communities at Mendota (as mentioned above), Black Dog, and Kaposia (in what is now South St. Paul). The Dakota also had communities along the Cannon River, which they called "Inyan Bosndata," or

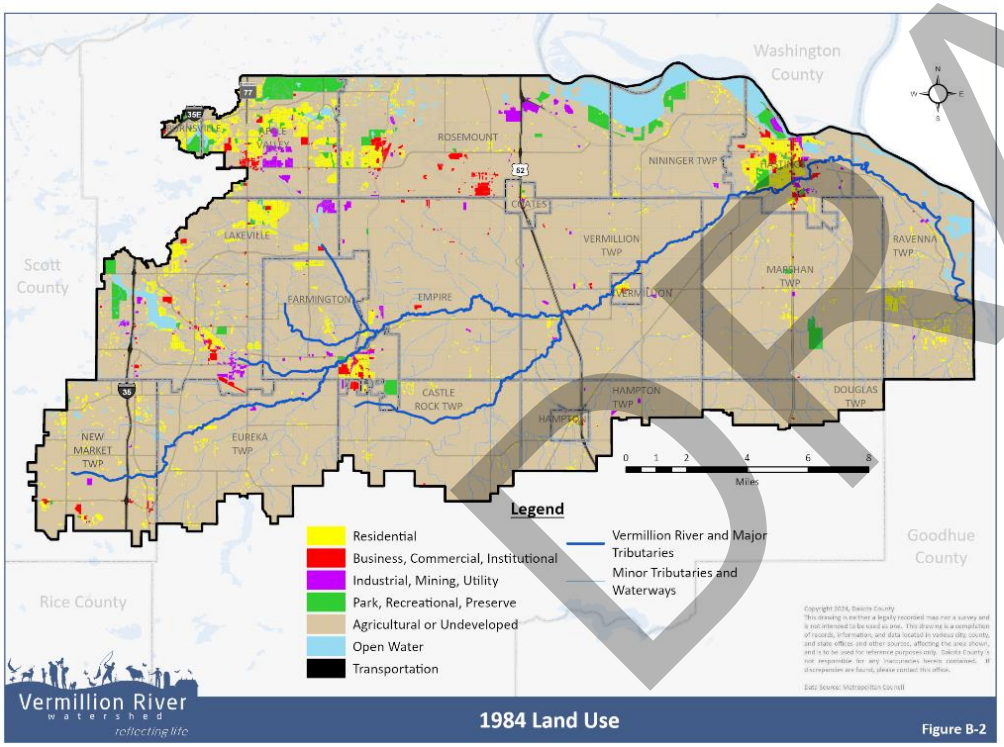
Standing Rock River, referring to the formation now known as Castle Rock in central Dakota County.

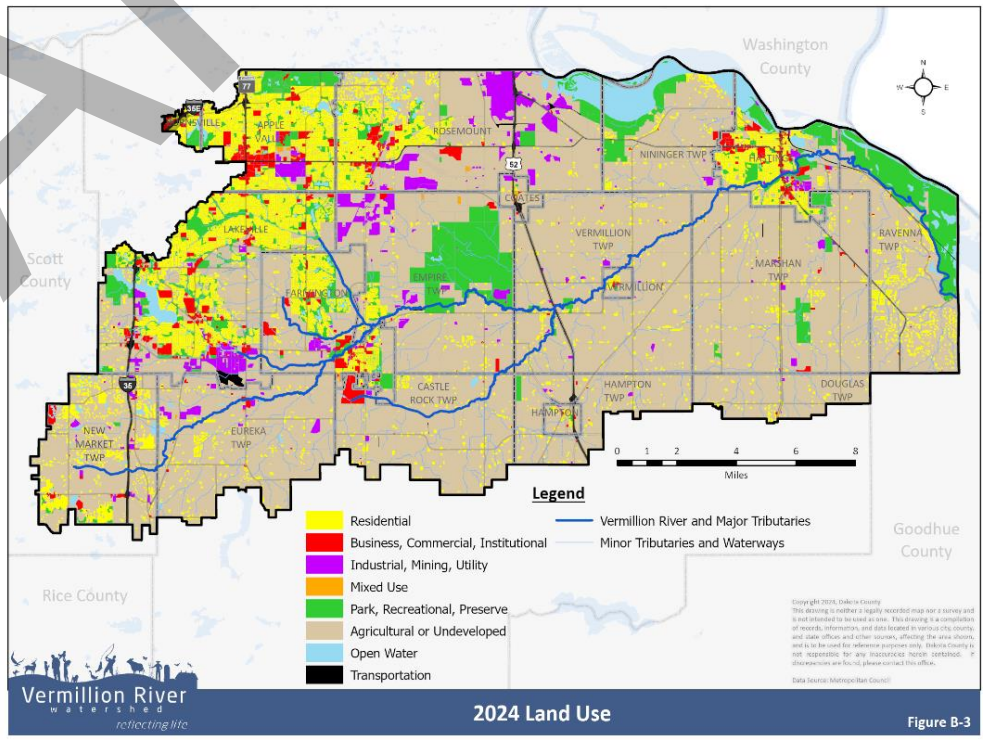
The indigenous Dakota people called the Vermillion River Wa Se Sa Wa Kpa, meaning Red Paint River, after the bright red and orange ocher in outcrops of St. Peter sandstone near the Vermillion River (such as Chimney Rock in Marshan Township). The color vermilion is a rich shade of red-orange, hence the present name.

From initial European settlement in the mid-1800s to the end of World War II, agriculture was the watershed's predominant land use. With rich soils and a location south of the Mississippi and Minnesota rivers, central Dakota and Scott counties developed later than communities north of these rivers. With growth expanding from the north over the last 50 years, land use in the northwestern portion of the Vermillion River Watershed is mostly suburban.

By the mid-1970s, residential development reached Burnsville and Apple Valley, and the I-35 corridor set the stage for future growth in Lakeville. By 1984, agricultural and undeveloped land represented 88 percent of the watershed *(Figure B-2)*.

Between 1984 and 2010, 18 percent of the watershed's land area converted from agricultural or undeveloped land to developed uses (residential, recreation, and industrial). Since the last VRWJPO plan update (using 2010 and 2020 land use data),





development continued at a slower pace with an additional 3 percent of the watershed's agricultural and undeveloped land shifting to development. Today, the watershed is about 67 percent agricultural and undeveloped land *(Figure B-3)*.

Park and recreational acres increased substantially between 1984 and 2020, due to the acquisition of park land by Dakota County and local governments and additional management areas by the DNR, notably, the addition of 7,000 acres for Gores Pool #3 Wildlife Management Area (WMA) and conversion of nearly 3,000 acres of the University of Minnesota's Rosemount Agricultural Research Center to Vermillion Highlands WMA.

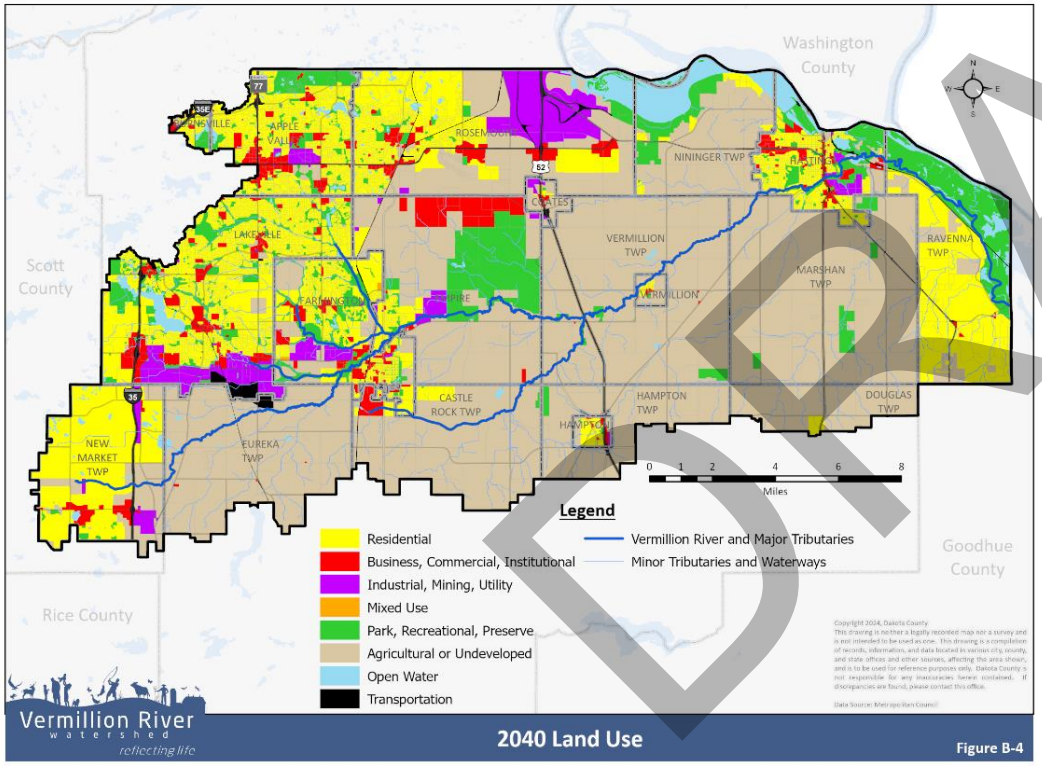


Table B-2: 1984, 2020 and Projected 2040 VRWJPO Land Uses

Land Use	1984 Acres	1984 Percent	2020 Acres	2020 Percent	2040 Acres	2040 Percent	Net change 1984-2040
Agricultural, Undeveloped	188,476	88.3%	144,154	67.3%	109,345	51.0%	-37.3%
Residential	10,211	4.8%	30,317	14.1%	55,033	25.7%	+20.9%
Park, Recreational, Preserve	3,922	1.8%	18,907	8.8%	18,806	8.8%	+7.0%
Open Water	6,062	2.8%	6,929	3.2%	7,227	3.4%	+0.6%
Industrial, Mining, Utility	1,775	0.8%	6,575	3.1%	7,495	3.5%	+2.7%
Business, Commercial, Institutional	2,117	1.0%	2,132	1.0%	13,561	6.3%	+5.3%
Transportation	884	0.4%	2,038	1.0%	2,947	1.4%	+1.0%

Each decade, local communities prepare comprehensive plans projecting future land use to address growth-related needs, such as housing, transportation, public sewer, drinking water, and parks. Future land use data from the most recent local plans show increases in housing, commercial, and industrial development, with reduction in undeveloped and agricultural lands. Agriculture is projected to remain the predominant land use in the watershed for the foreseeable future.

Local community assessments of the most likely changes that will occur by 2040 include:

- Elko New Market and Hastings mostly transition out of rural agriculture to large-lot rural residential.

- Industrial development is expected to increase, which could include increased demand for water and/or electricity.
- Development occurs eastward in Rosemount along County Hwy 46 east of U.S. Hwy 52.
- Rural townships in Dakota County remain mostly agricultural, which will become the land use for roughly half of the watershed.

Land Use Change and Water Impacts

Both agriculture and development can alter natural hydrologic cycles, processes, and connections. Over the past 150 years, natural hydrology has been altered through land-use activities in major ways, including:

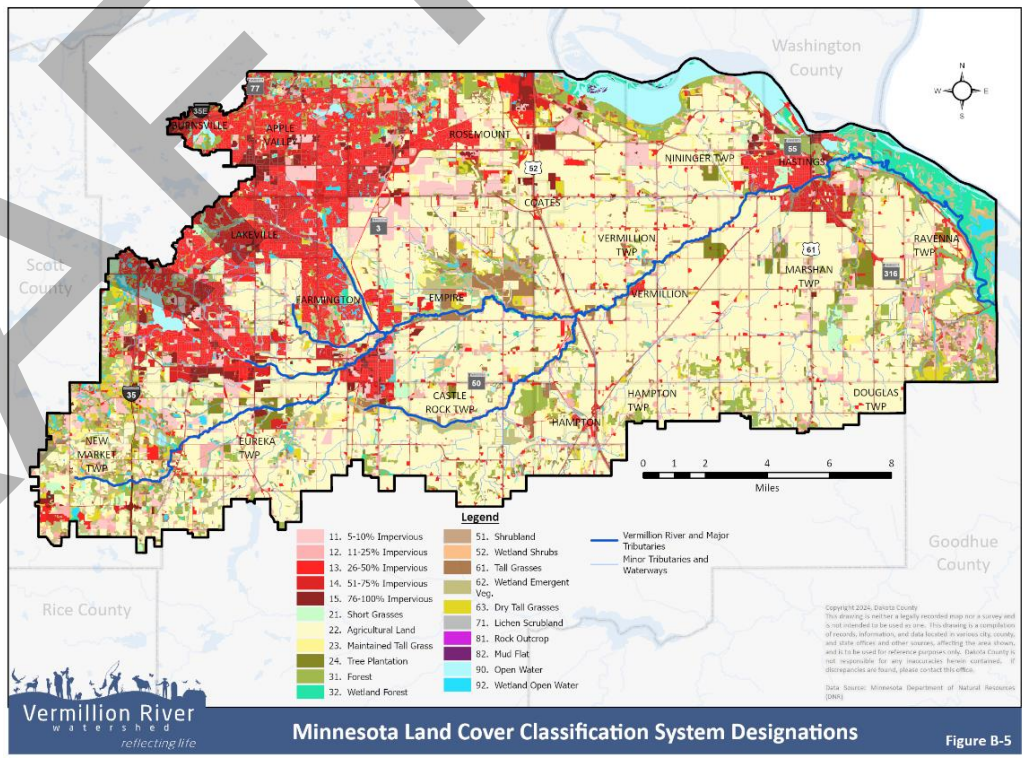
- Impeding natural infiltration that recharges groundwater,
- Expediting water movement off the land to surface waterways, and
- Increased groundwater withdrawals related to population increases and changes in agricultural production (irrigation).

Urban: Increased Impervious Surfaces

The increase in impervious surface that usually accompanies urban development:

- Promotes rapid runoff of large volumes of stormwater and snowmelt to nearby waterways, causing channel and downstream bank erosion, and at the same time carrying sediment, surface pollutants, and heat; and
- Impedes the natural process of soil infiltration and groundwater recharge.

Based on studies by Maryland Department of Natural Resources, negative impacts to stream health can occur with as little as 10 percent impervious cover in a watershed. As the proportion of impervious surface increases, streams collect more heat and pollutants, with impacts to native insects, plants, fish, and mussels. The Minnesota Land Cover Classification System Map displays estimates of impervious surface (*Figure B-5*). More than 23 percent of the watershed's land area exceeds 10 percent impervious cover.



In accordance with the Metropolitan Surface Water Management Act (MN Statute 103B), the VRWJPO is granted the authority to regulate the use and development of land for those LGUs that do

not have land use authority (and other situations as described in 103B.211). The VRWJPO Standards are included in Appendix D and include specific requirements regarding volume control. For those LGUs that do have land use authority, they must have a local water management plan that is in conformance with the Vermillion River Watershed Management Plan, with Standards at least as stringent.

The VRWJPO Standards require (with some exceptions) that runoff volumes generated post-development from the 2-year/24-hour storm in excess of pre-development conditions (2005 land cover) be managed on site (primarily promoting infiltration, if feasible). They also include stipulations for managing peak runoff rate s to predeveloped conditions for the 1,10,100-year/24-hour storm, and regulations for drainage alterations in the watershed landscape (*see Appendix D*).

Rural: Cropping Practices and Water Management

Although the amount of land in agriculture has diminished over time, some cultivated lands have become more productive through irrigation, drainage and nutrient management. While these practices can yield higher economic benefits for farm operators, they can influence watershed hydrology and water quality through:

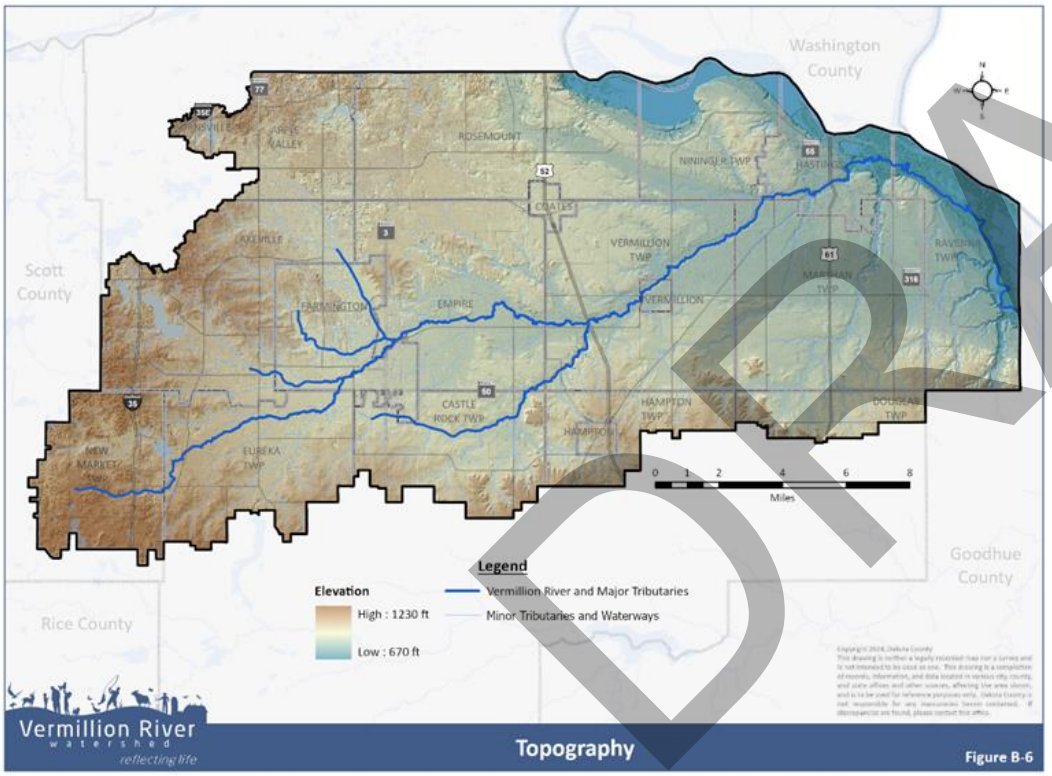
- Increased intensity of crop irrigation
- Expanded drainage and ditching to rapidly convey excess water from the land
- Increased use of inputs, such as fertilizer and pesticides, that move into groundwater and surface water
- Decreased soil ability to hold water due to reduced organic matter and reduced diversity of soil organisms, such as those provided by crop residue, perennial or multi-year vegetation (pasture, alfalfa, etc.), animal manure, cover crops, or other practices

Cropping practices that support agricultural production while maintaining natural hydrology and soil health include:

- Crop rotation
- Cover crops
- Conservation tillage
- Water-saving irrigation systems and practices
- Conservation drainage systems
- No-till planting

B-2 Topography and Fluvial Geomorphology

The overall topography of the Vermillion River Watershed is relatively flat, with low relief throughout most of the watershed. The watershed's highest elevation is 1,230 feet and lowest elevation is 670 feet. The western watershed has varied topographical features due to glacial moraine deposits. The central and eastern watershed are relatively level glacial outwash plains. Steep bedrock bluffs border the Mississippi River in the easternmost watershed, although bluff lands make up a small proportion of the overall watershed area (*Figure B-6*).



Over the years, the VRWJPO has funded several fluvial geomorphic assessments to describe control points, knickpoints, accelerated erosion and habitat quality issues, improve the understanding of various bank or channel stability locations, and to help identify opportunities for restoration projects addressing geomorphic processes and habitat. By funding these assessments, staff can derive geomorphic characteristics as they relate to various subwatersheds, identifying potential project locations. In addition, the VRWJPO has funded a variety of subwatershed assessments to briefly describe subwatershed landscape characteristics and to identify potential pollutant reduction BMPs.

It is noted in the beginning of the fluvial geomorphic assessments that it is important to consider the erosion and depositional processes that are characteristic to streams. As is seen throughout the watershed, streams are continually moving sediment eroded from the bed and banks in high-velocity areas and depositing them elsewhere in lower-velocity areas. This process results in the migration of rivers within their floodplains, known as dynamic equilibrium. When this equilibrium is out of balance, a stream reach may be defined as in a degradation status (eroding) or an aggradation status (depositing). When a channel is in equilibrium, it may move across the floodplain, erode, and deposit sediment, but general platform geometry, cross-sectional shape and slope remain relatively constant over human lifetimes.

High-level findings from these fluvial geomorphic assessments can be found below. For a more detailed look at assessment findings, please reference the full reports on the VRWJPO website.

Upper Mainstem Subwatershed

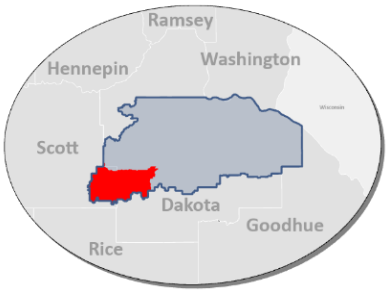


Figure B-7: Upper Mainstem Subwatershed Inset Map

In 2014, the Scott SWCD completed a subwatershed assessment within the Upper Mainstem subwatershed (*Figure B-7)* to identify potential phosphorus reduction BMPs. An updated assessment was then completed in 2024. As the Upper Mainstem subwatershed has land area in both Scott and Dakota Counties, DCSWCD completed a subwatershed assessment within the Dakota County portion in 2019. Within these reports, general fluvial geomorphic characteristics are defined.

Historically, the subwatershed has been nearly all agricultural land use, with the City of Elko New Market being the only developed area. In more recent years, the City has continued to add small amounts of developed area in the Scott County portion of the subwatershed. The City of Lakeville has annexed portions of the southeastern part of the subwatershed in Dakota County. That said, the majority of subwatershed acreage is still in agricultural production.

Onsite and desktop findings associated with the assessment included:

- The majority of areas in agricultural production use conventional tillage practices, which contribute to high rates of surface erosion in fields.
- The majority of the Vermillion River within the subwatershed either has maintained natural riparian vegetation adjacent the river or has had riparian restorations take place.
- Extents of the Vermillion River that historically had cropping up to the river's edge benefitted from implementation of Minnesota's Buffer Law.
- Erosional features within agricultural fields present opportunities for various pollutant reduction BMPs throughout the subwatershed.

South Creek Subwatershed

The South Creek subwatershed (*Figure B-8*) fluvial geomorphic assessment was completed in 2009. The purpose of the assessment was to provide potential restoration projects and prioritize them according to:

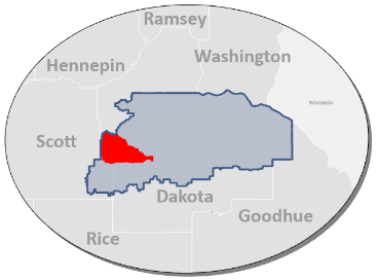


Figure B-8: South Creek Subwatershed Inset Map

- Ability of project to address specific goals
- Compatible with current land use
- Have reasonable design, installation and maintenance costs
- Dependency on installation of other practices or coordination with other landowners
- Nature of working relationship with landowner and SWCD/NRCS/VRWJPO staff

The assessment was completed to provide a more up-to-date inventory of potential projects, as the previous geomorphic assessment was completed in 1999.

The VRWJPO's consultant collected and analyzed aerial photographs, plat maps, geologic maps and the 1999 assessment to define historic subwatershed characteristics. Land use changes, soils and road crossings were also reviewed to determine stream reach breaks based on these interventions. Field reconnaissance then informed current subwatershed conditions.

In 1855, South Creek was a relatively short creek and very sinuous. There were no major wetland areas and no tributaries located within the subwatershed. By the time of the 1999 assessment conducted by the DNR, South Creek had multiple tributaries, and South Creek and its tributaries were straightened and channelized or ditched. Straightening and lack of woody vegetation are pointed to as a reason for channel erosion.

Onsite findings included:

- The straightening and ditching of South Creek had resulted in a lack of channel complexity and thus, aquatic habitat.
- Along several reaches, channel connectivity was interrupted.
- Much of the stream within the subwatershed lacked sinuosity and showed signs of channel widening.
- A previous restoration of South Creek near Cedar Avenue consisting of channel bends and riffles provide increased channel complexity when compared to unrestored reached. Banks were found to be stable and the channel was highly sinuous and uniform in planform.

Middle and North Creek Subwatersheds

In 2012, the VRWJPO again contracted with a consultant to define fluvial geomorphic characteristics within the Middle and North Creek subwatersheds (*Figures B-9 and B-10*). The two were lumped together as they had similar geomorphic characteristics, both being headwater tributaries to the Vermillion River.

The assessment found that, historically, the headwaters of both creeks were marsh and wetland surrounded by prairie and some forest. The channels were also sinuous and much shorter. Over time, agricultural and residential development resulted in the draining of historic wetlands and caused the channels to be straightened in many areas. On-site findings included:

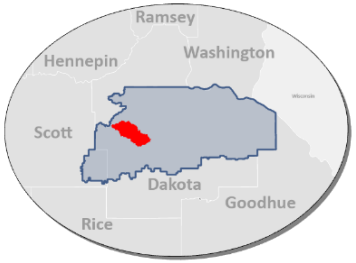


Figure B-9: Middle Creek Subwatershed Inset Map

- Channels are generally low-gradient, with bank erosion and incision occurring in the upper portions of the subwatershed.
- Channels have been straightened into ditches with little riparian vegetation or buffer from row crops or residential development.
- Increased water flow into the streams following adjacent development and tiling has resulted in steeper channel banks, incision, and bank erosion in many areas.
- Previously restored sections of North Creek and Middle Creek have resulted in increased channel sinuosity, cooler temps for cooler water, aquatic biota, and improved riparian vegetation.

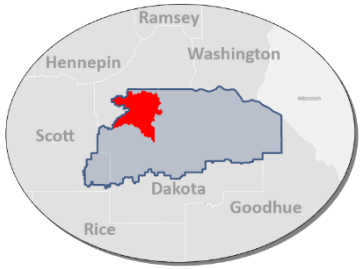


Figure B-10: North Creek Subwatershed Inset Map

Lower Vermillion River Subwatershed

In December 2018, the VRWJPO hired a consultant to complete a geomorphic assessment for the Lower Vermillion River subwatershed (*Figure B-11*). The study looked at the Vermillion River from US Highway 52 to Vermillion Falls in the City of Hastings.

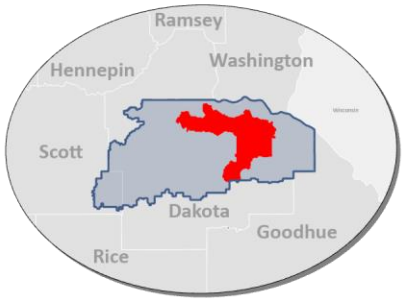


Figure B-11: Lower Vermillion River Subwatershed Inset Map

The assessment detailed that the Lower Mainstem Vermillion River generally meanders within a large alluvial valley, likely formed by a glacial hydrologic regime that set and confined the course of the model Vermillion River. Historically, the area was covered by prairies and floodplain forests. However, much of the historic natural areas were cleared, plowed, drained, and converted to agriculture. The modern-day Lower Vermillion River is almost entirely surrounded by agricultural cropland, with some urban development near Vermillion and Hastings.

Land conversion included the straightening of the Vermillion River and its tributaries, and the draining of wetlands. These hydrologic changes resulted in adjustments to channel slopes and dimensions. On-site findings associated with the assessment included:

- Pollutant loading is a significant concern as extensive agricultural drainage results in flashy flows and in-stream and surficial soil loss.
- Overall, physical habitat complexity along the Lower Mainstem Vermillion River is greater than many headwaters reaches and straightened tributaries; however, aquatic habitat has been impacted from warm water surficial runoff.
- The Lower Mainstem Vermillion River maintains sinuosity in most locations, differently than other subwatershed streams.

Middle Mainstem Vermillion River Subwatershed

The Middle Mainstem subwatershed (*Figure B-12*) is a mixture of developed, agricultural and conservation areas. Developed areas include the City of Farmington, the City of Empire and the City of Vermillion. The Middle Mainstem of the Vermillion River and its tributaries flow through these developed areas as well as Whitetail Woods Regional Park, a Dakota County Conservation Area and agricultural fields. Neither a geomorphic or subwatershed assessment has been completed in the subwatershed to date; however, high-level desktop analysis shows:

- Historically, several areas in agricultural production did not leave natural riparian corridor vegetation adjacent the stream.
- More recent aerial imagery shows that the majority of the Middle Mainstem Vermillion River now has natural riparian habitat adjacent the river.
- Many of the tributaries to the Middle Mainstem Vermillion River are lacking natural riparian habitat.

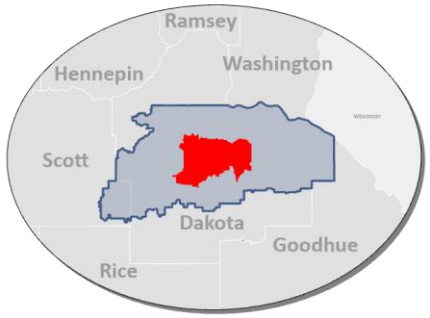


Figure B-12: Middle Mainstem Subwatershed Inset Map

South Branch Vermillion River Subwatershed

In 2020, the DNR completed a geomorphic overview in the South Branch subwatershed (*Figure B-13*) to help inform potential causes of the aquatic life impairment for fish and invertebrate communities. The geomorphic assessment included desktop analysis, review of current and historical aerial photos, land use changes, and generalized stream and valley type classification of reaches using GIS tools. Site reconnaissance also took place to observe channel conditions near crossings and confirm aspects of the desktop analysis such as stream and valley type.

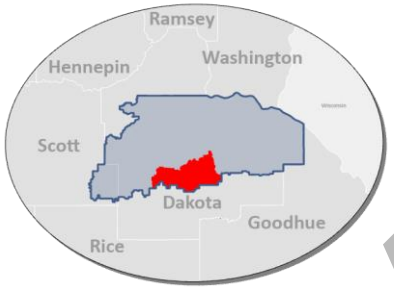


Figure B-13: South Branch Subwatershed Inset Map

Historically, 75 percent of land cover in the South Branch subwatershed was prairie. The modern subwatershed is dominated by agricultural production land use, with small percentages of forested/grasslands, developed area and wetland. DNR staff used the Watershed Health Assessment Framework (WHAF) to assess how inherently vulnerable the current landscape is to erosion. The WHAF found that the subwatershed is moderately susceptible to erosion.

Onsite reconnaissance findings included:

- Many of the ditched segments of the South Branch Vermillion River and its tributaries were well-vegetated with gradually sloped sides, having created small floodplain areas less susceptible to streambank erosion.
- A culvert inventory associated with the assessment found several undersized culverts on the South Branch Vermillion River, negatively impacting channel stability.
- Downed woody vegetation was observed filling stream cross-sectional areas, causing widening and sediment aggradation.

Mississippi Direct Subwatershed

In 2011, the VRWJPO's consultant completed a geomorphic assessment of a portion of the Mississippi Direct subwatershed (*B-14*), focusing on the Etter Creek and Ravenna Coulees. The purpose of the assessment was to improve the understanding of stream bank stability and to identify opportunities where restoring geomorphic processes and conditions would be beneficial.

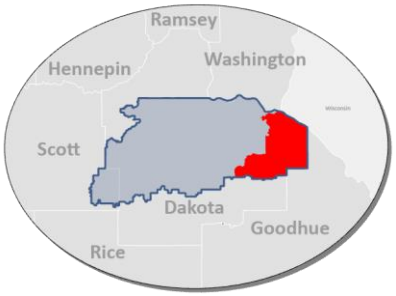


Figure B-14: Mississippi Direct Subwatershed Inset Map

Etter Creek and the four Ravenna Coulees studied are located along the eastern edge of Dakota County and drain directly to the Vermillion River near its mouth at the Mississippi River. Historically, plat maps from 1855 showed no indication of streams or associated tributaries within the study area. Some small areas of prairie were called out with the rest of the area presumed to be forested.

Onsite reconnaissance findings included:

- The majority of land within the study area has been converted to agriculture, with the exception of areas too steep to farm.

- Clearing of the land for agricultural production reduced infiltration rates, sped the flow of rainwater and snowmelt which resulted in the observed ravines
- Channels formed from erosion have been adjusting their geometry by incising and widening to compensate for higher flow volumes.
- Erosional characteristics have resulted in downstream sedimentation, loss of land, damage to infrastructure and reduction of riparian habitat.

B-3 Soils

Soils are described and grouped based on their physical and chemical properties, including their hydrologic soil group (HSG). A soil's HSG classification describes its infiltration rate (velocity at which water enters the soil), transmission rate (groundwater migration horizontally through soil), and potential to produce runoff. The four hydrologic soil groups are illustrated in Figure B-15 and also described. In short, soils with higher sand percentages produce low runoff potential (Group A) while those with higher clay content have high runoff potential (Group D).

Group A: Well- to excessively drained soils with low runoff potential and high infiltration rates, even when thoroughly wetted. They consist of sand, loamy sand or sandy loam types of soil that are typically deep and have a high rate of water transmission.

Group B: Soils with silt loam or loam compositions which have moderate infiltration rates when thoroughly wetted. Moderately well- to well-drained soils with moderate infiltration rates when thoroughly wetted. Soils are moderately well to well drained with moderately fine to moderately coarse textures.

Group C: Soils that have sandy clay loam texture. They have low infiltration rates when thoroughly wetted and consist chiefly of soils with a layer that impedes downward movement of water and soils with moderately fine to fine structure.

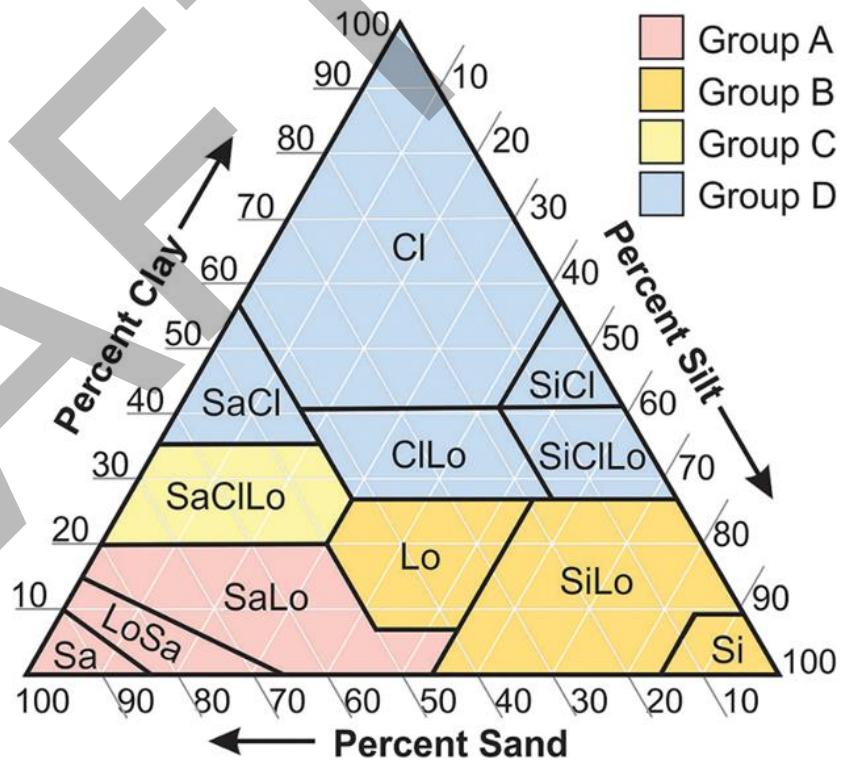


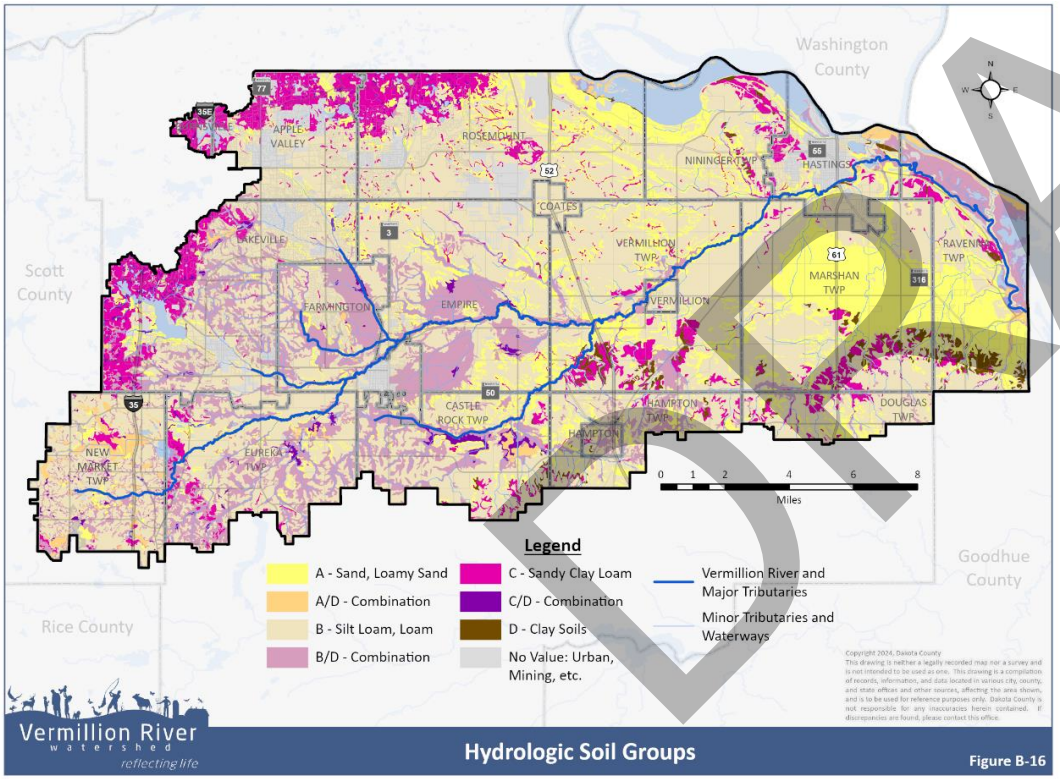
Figure B-15: Soil Texture Triangle

Group D: Soils that have clay loam, silty clay loam, sandy clay, silty clay or clay textures. This HSG group has the highest runoff potential and have very low infiltration rates when thoroughly

wetted. They consist chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a claypen or clay layer at or near the surface and shallow soils over nearly impervious material.

Some soils classified as within group D are included due to a high water table creating a drainage problem. If these soils become effectively drained, they are placed in a different soil group. For example, a soil may be classified as an A/D soil, indicating that the drained soil is in group A, while the undrained soil is in group D.

The majority of the VRWJPO's soils are Groups A and B – well-drained, silty or loamy soils with occasional sandy areas. Areas of low infiltration (Groups C and D) are generally isolated in river and tributary floodplains, and lower and flatter areas of the upper watershed. (*Figure B-16*).

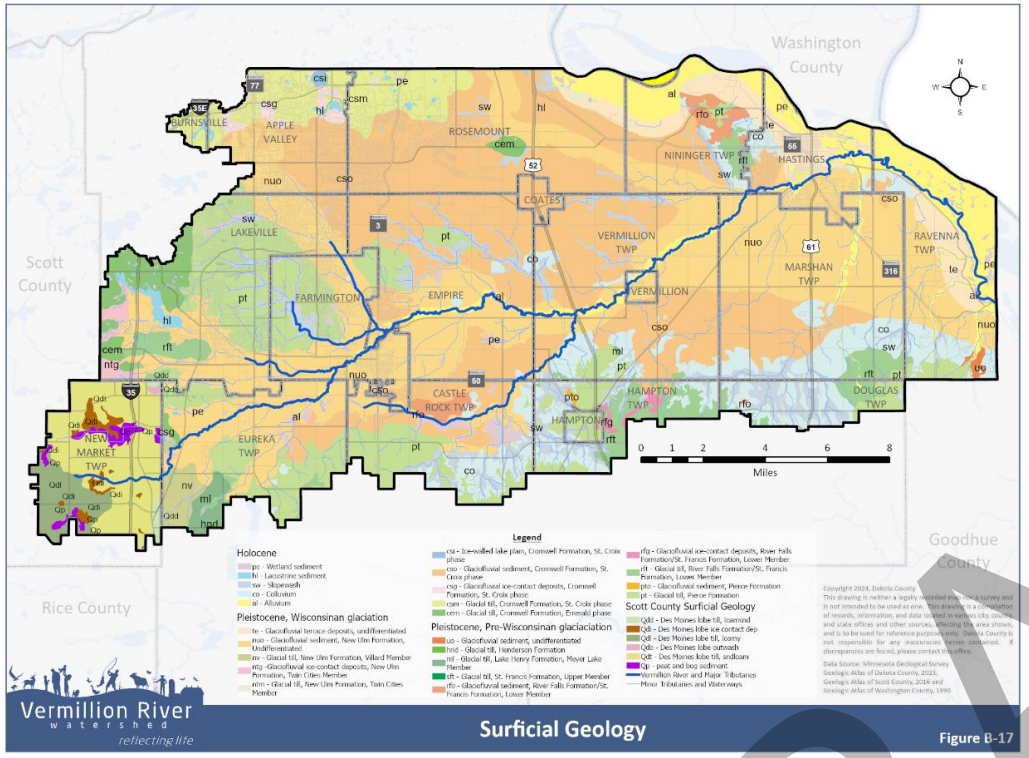


Dakota and Scott counties' interactive GIS mapping sites contain soils data that are electronically digitized from soil survey maps originally created by the NRCS. The following maps hosted online also illustrate other soil features: Vermillion River Watershed High Infiltration Soils, Vermillion River Watershed Highly Erodible Soils, Vermillion River Hydric Soils.

B-4 Geology

Surficial Geology

Over millions of years, geologic processes have determined the watershed's physical environment. The distribution of bedrock, unconsolidated sediments, landforms, and structural features are the framework upon which current biological and human environments exist. The characteristics of the physical environment ultimately determine the availability of natural resources, the susceptibility of resources to pollution, and the success of living organisms in the watershed. Wind, water, and ice shaped the watershed's landscape, and movement of continental ice sheets was the most influential process on watershed topography. During the Pleistocene Epoch (2 million to 10,000 years ago), continental glaciation was taking place in Dakota County. The most recent glaciation, known as the Wisconsin Glaciations, began approximately 75,000 years ago and ended approximately 12,000 years ago. As glaciers moved across the landscape, glacial moraines and outwash plains defined the area, with topographic character originating from the various glacial advances and retreats (*Figure B-17*).



The northwestern watershed lies in the Eastern St. Croix Moraine, and the southwestern watershed lies in the Prior Lake Moraine. Moraines are the masses of rocks, gravel, sand, and clay transported by glaciers and deposited at the edge of a glacier. The Eastern St. Croix Moraine marks the limit of the Superior Lobe, and the Prior Lake Moraine marks the limit of the Des Moines Lobe. Lobes are finger-shaped glaciers that develop at the edge of continental ice sheets. Moraine landscapes have rolling to steep hills and closed depressions where lakes and wetlands are common. Perched water tables can also be found in these areas due to the variability in material size, consisting of mixtures of sand, gravel, boulders, and clay.

As mentioned, moraine sediments are a complex assortment of till (mixed sand, silt, clay, pebbles, cobbles, and boulders), silt and sand lenses, and sand and gravel deposits. The till of the Superior Lobe is red and has a coarse sandy loam texture. The till of the Des Moines Lobe is gray to yellowish brown with a fine loam texture. A till plain extends away from the Prior Lake Moraine into the west-central watershed. This till plain is composed of a thin layer of Des Moines Lobe till covering the sediments from older glaciations. The topography of this area is characterized by long rolling hills.

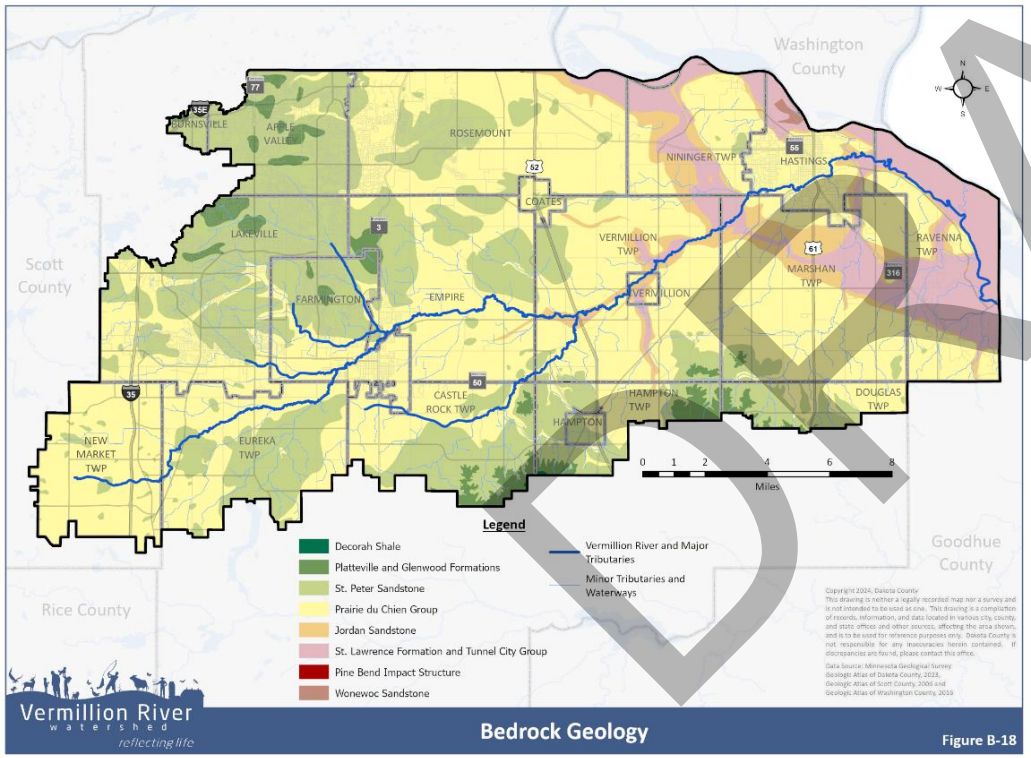
Beyond the watershed's moraines and till plain are outwash plains and valleys. Outwash blanketed the landscape as melting glaciers drained water away, leaving deposits of sand, gravel, and other sediments. The Superior Lobe outwash plain extends over much of the watershed area, with sands and gravels that become thinner and finer in texture farther away from the moraine. Outwash associated with the Des Moines Lobe cuts across the Superior outwash plain in broad valleys. The sands and gravels of the outwash valleys also become thinner and finer eastward away from the moraine. The outwash plain and the outwash valleys are very subtle topographic features. They appear on the landscape as nearly level topography and terraces.

Modern streams and rivers dissect and cross the glacial geomorphology of the watershed. The Vermillion River and its tributaries have their own floodplains, terraces (abandoned floodplains due to river downcutting), meanders, bars, natural levees, and other landforms. The Mississippi River, along the eastern edge of the watershed, has a wide floodplain and three distinct terrace levels. Sediments of these floodplains and terraces are moderately sorted materials deposited by rivers and streams

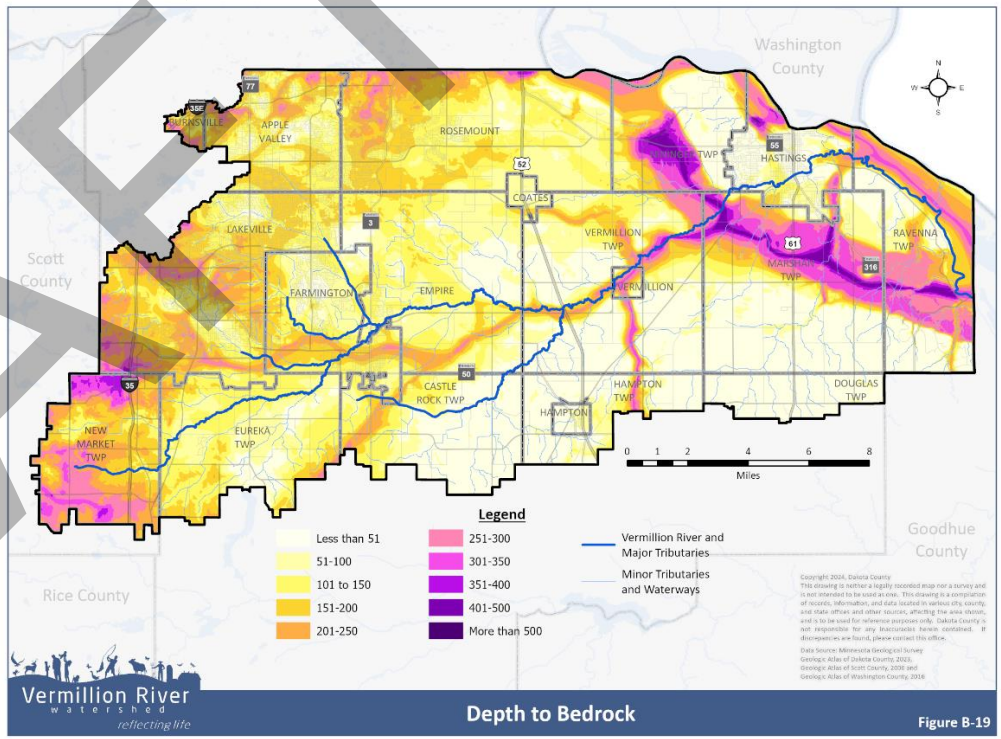
during flood stage. The fluvial sediments of the Mississippi River are much thicker than those of the Vermillion River.

Bedrock Geology

Sedimentary bedrock of marine origin lies directly beneath unconsolidated glacial materials, at depths ranging from surface exposure to more than 500 feet. The bedrock surface is determined by each rock type's resistance to weathering. Shales and poorly cemented sandstones break down rapidly, while limestones and dolostones are more resistant. Resistant rock units become high points in the bedrock topography, while the less resistant rock units become low areas (*Figure B-18*).



The most significant topographic features of the bedrock surface are the buried bedrock valleys formed by ancient drainage patterns. The largest of these valleys is in the eastern watershed and is believed to be an ancient Mississippi River course. This valley is filled with outwash from the last ice age (*Figure B-19*). Sediments from advancing and retreating glaciers covered the bedrock and filled the valleys, creating the modern landscape.



The watershed is on the southeastern edge of the Twin Cities Basin bedrock formation, so the bedrock surface in the watershed slopes downward toward the north and west. Dominant bedrock features in the watershed are the Vermillion Anticline (a fold, convex upward) and the Empire Fault. Both are oriented from the

northeast to the southwest, almost parallel to the course of the modern Vermillion River. These structural features are not expressed on the land surface but can be seen in bedrock outcrops along the Mississippi River bluffs above Hastings.

B-5 Climate and Precipitation

The watershed has a humid continental climate, with four distinct seasons ranging from hot, humid summers to frigid winters. Minnesota and the Upper Midwest have some of the widest temperature ranges in the U.S., occasionally reaching negative double digits Fahrenheit in winter and exceeding 100 degrees Fahrenheit in summer. Storms can be severe, typically resulting from cold, dry air masses from the north colliding with warm, humid air masses from the south. Monthly averages for minimum, maximum, and average temperatures and inches of precipitation are compiled over the past decade in *Table B-3*.

Table B-3: 2015-2024 Rosemount Weather Station Data

Monthly Average	Precipitation (Inches)	Minimum Temperature (F)	Maximum Temperature (F)	Average Temperature (F)
Jan	0.8	7.6	23.4	15.5
Feb	1.0	6.1	26.4	16.2
Mar	1.8	22.4	41.2	31.8
Apr	2.7	34.8	54.6	44.7
May	4.1	48.2	69.0	58.6
Jun	4.2	59.4	80.2	69.7
Jul	4.4	62.1	82.7	72.4
Aug	4.8	59.0	79.4	69.2
Sep	3.3	52.7	74.6	63.7
Oct	2.9	38.5	59.0	48.7
Nov	1.5	26.1	43.0	34.5
Dec	1.1	14.7	29.7	22.2
Annual Average	32.5	36.0	55.3	45.6

Source: Minnesota DNR, Climate Data. Data collected from Rosemount Weather Station.

Figure B-20 demonstrates that Minnesota is getting warmer, with increasing average annual temperatures between 1895 (the earliest recorded temperatures) and 2024 for the Mississippi River-Lake Pepin Watershed Basin, which includes the Vermillion

River Watershed. The trend line shows an estimated overall increase of 2.35 degrees for the time period.

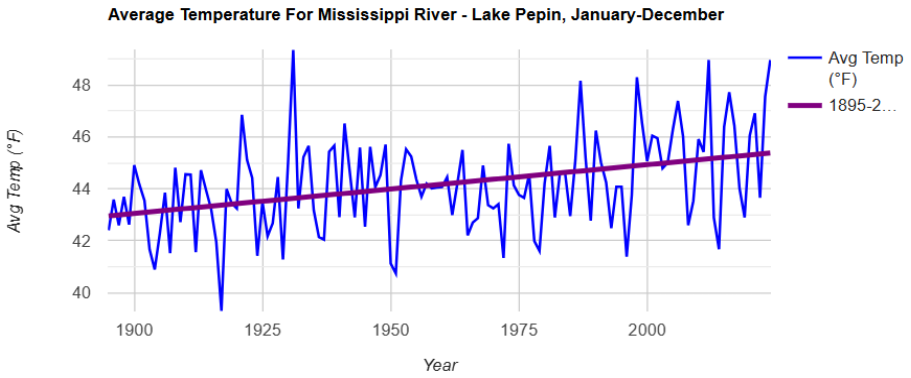


Figure B-20: Average Annual VRWJPO Temperatures (F), 1895-2024

Source: Minnesota DNR, Climate Data

Both maximum temperatures and minimum temperatures have increased, with warming has been more pronounced in winter than in summer. Annual maximum temperatures (*Figure B-21*) have increased by 1.2 degrees since 1895, while annual minimum temperatures (*Figure B-22*) have increased by 3.7 degrees.

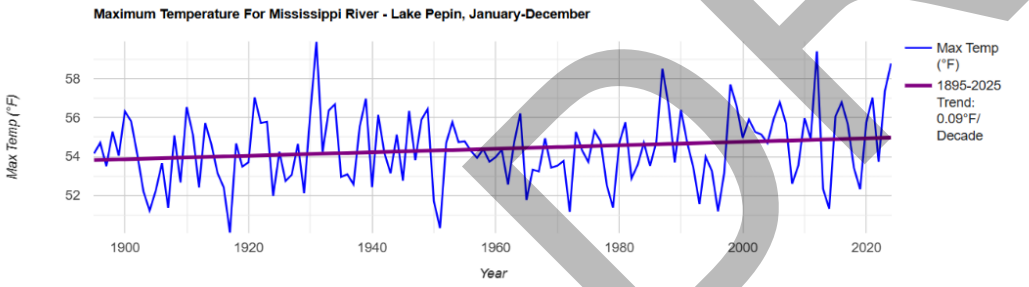


Figure B-21: Maximum VRWJPO Temperatures (F), 1895-2024

Source: Minnesota DNR, Climate Data

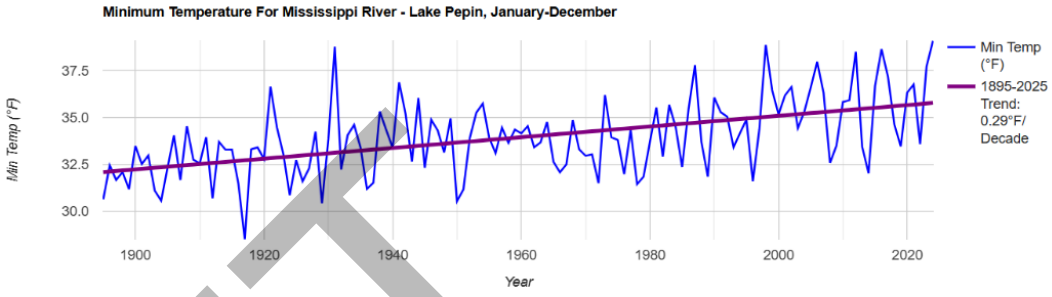


Figure B-22: Minimum VRWJPO Temperatures (F), 1895-2024

Source: Minnesota DNR, Climate Data

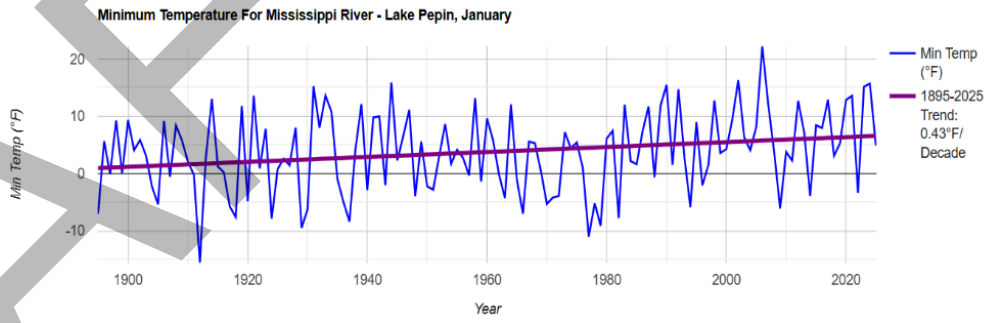


Figure B-23: Minimum January Temperatures (F), 1895-2024

Source: Minnesota DNR, Climate Data

In summary, warmer winter temperatures are a dominant trend. Figure B-23 shows that January minimum temperatures have increased by 5.5 degrees.

Figure B-24 demonstrates that Minnesota also is getting wetter. The graph shows average annual precipitation between 1895 and 2024 for the Mississippi River-Lake Pepin Basin, which includes the Vermillion River Watershed. While the annual precipitation totals range dramatically from year to year (from 12 to 45 inches),

the overall trend (red line) is increasing. The overall annual increase over twelve decades is estimated at 6.4 inches.

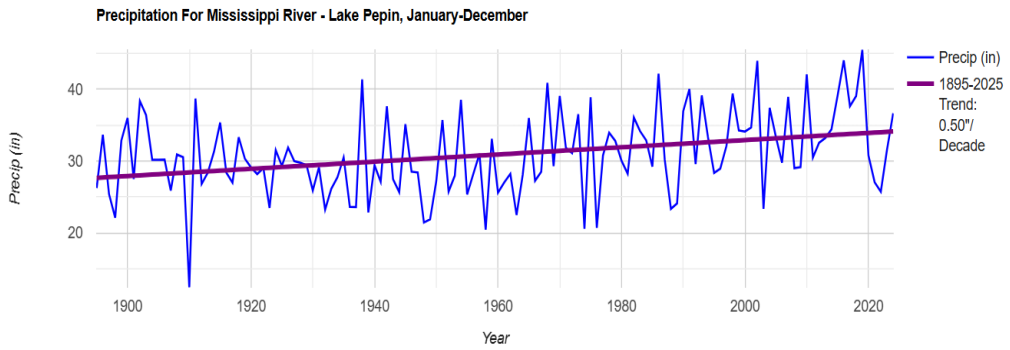
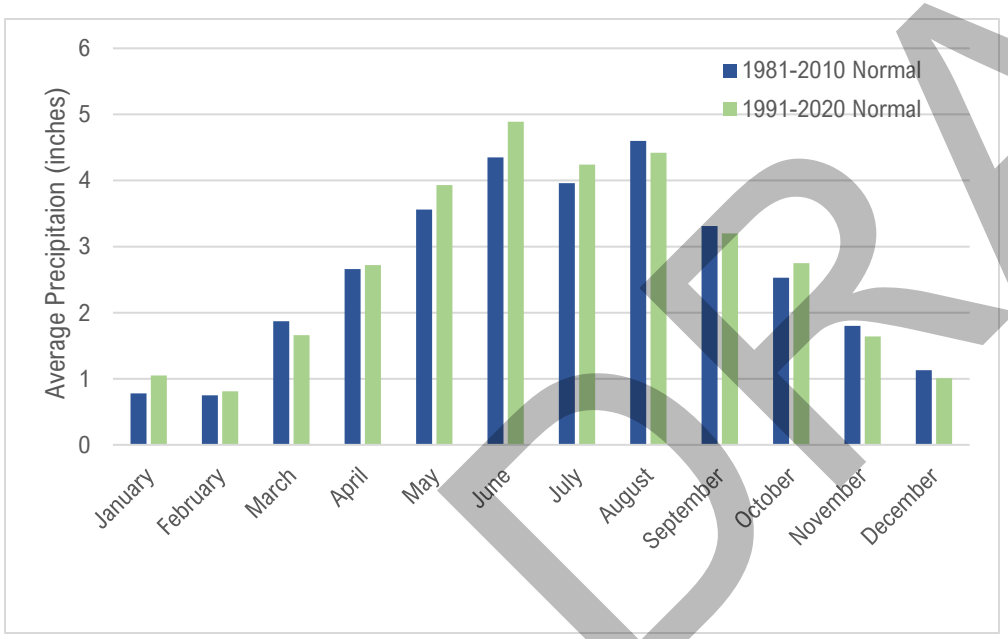


Figure B-24: Average Annual Precipitation, 1895-2024

Source: Minnesota DNR, Climate Data



Source: NOAA Monthly Precipitation Normals, 1991-2020, Farmington Weather Station

The National Weather Service, a division of NOAA, has collected and studied climate data within the Greater Twin Cities area for more than a century. Historical data on precipitation are presented as "normals," or the average of the past 30 years (1991-2020), not the entire available climate record since 1888. Normals take climate changes over time into account.

The previous 30-year period (1981-2010) had a normal total annual precipitation consisting of rain and snow equivalent to 31.3 inches. The normal total annual precipitation for the most recent 30-year period (1991-2020) consisting of rain and snow is equivalent to 32.32 inches.

Although the two most recent normal periods have similar total precipitation amounts, data suggest that the frequency and severity of storms appears to be increasing. National Weather Service data for all of Dakota and Scott counties over the last three normal periods shows an increase in severe winter and summer weather events.

Table B-4: Severe Summer Events for Dakota and Scott Counties

Severe Summer Events	1971-2000 Dakota	1971-2000 Scott	1981-2010 Dakota	1981-2010 Scott	1991-2020 Dakota	1991-2020 Scott
Flash Flood	4	3	11	12	21	16
Flood	4	4	8	13	10	16
Hail	60	55	136	144	224	199
Thunderstorm Wind	67	60	134	95	180	141
Tornado	12	7	17	13	19	17
Total Summer Events	**147**	**129**	**306**	**303**	**454**	**389**

Source: National Oceanic and Atmospheric Administration, National Center for Environmental Information, Storm Events Database

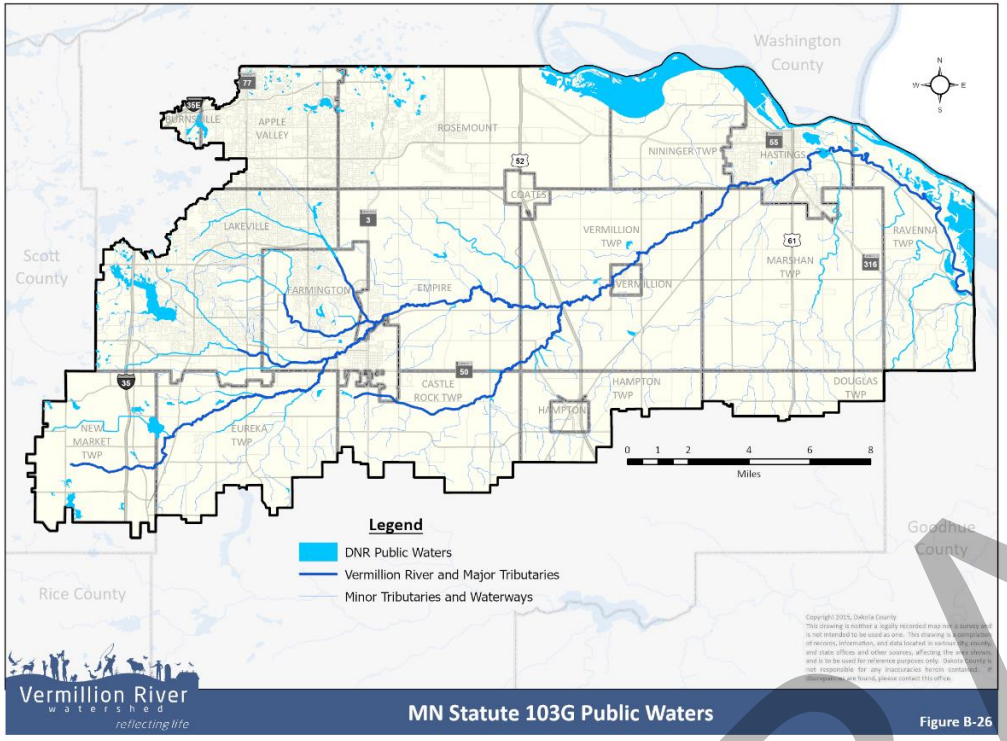
In 2014, the VRWJPB adopted the use of NOAA Atlas 14, Vol. 8 precipitation frequency estimates for evaluating and designing

stormwater infrastructure. Atlas 14 improved upon its predecessor, Technical Paper 40 (TP40), with denser data networks, a greater period of record, more robust statistical analyses, and improved spatial interpolation and mapping. For the Vermillion River Watershed, Atlas 14 generally forecasts higher precipitation amounts than TP40 for specific storm events, such as the 100-year storm (storms with a one percent chance of occurring). Because the projected rainfall values have increased, existing infrastructure may be inadequately designed to handle current and future climate conditions.

B-6 Surface Water Resources

The Vermillion River Watershed is home to 459 miles of streams, 9 public water lakes and 8,363 acres of public water wetlands. See all waters classified as DNR Public Waters in *Figure B-26*. DNR Public Waters are defined as:

a. Water basins assigned a shoreline management classification by the commissioner, under sections 103F.201 to 103F.221, except wetlands less than 80 acres in size that are classified as natural environment lakes;
b. waters of the state which have been finally determined to be public waters or navigable waters by a court of competent jurisdiction;
c. meandered lakes, excluding lakes that have been legally drained;
d. water basins previously designated by the commissioner for management for a specific purpose such as trout lakes and game lakes pursuant to applicable laws;
e. water basins designated as scientific and natural areas under Section 84.033;
f. water basins located within and totally surrounded by publicly owned lands;
g. water basins where the State of Minnesota or the federal government holds title to any of the beds or shores, unless the owner declares that the water is not necessary for the purposes of the public ownership;
h. water basins where there is publicly owned and controlled access that is intended to provide for public access to the water basin;
i. natural and altered watercourses with a total drainage area greater than 2 square miles in area;
j. natural and altered watercourses designated by the commissioner as trout streams; and
k. public waters wetlands, unless the statute expressly states otherwise.



By dividing the "major" (8-digit HUC) Vermillion River Watershed into subwatersheds, characteristics pertaining to finer-scale water resources can be more easily established. The eight subwatersheds within the Vermillion River Watershed are respectively titled: Upper Mainstem, South Creek, Middle Creek, North Creek, South Branch, Middle Mainstem, Lower Mainstem and Mississippi River Direct. Below are descriptions of notable surface water resources found within each of the named subwatersheds.

Vermillion River Mainstem

While the headwaters of the Vermillion River occur within the North Central Hardwood Forest ecoregion, the majority of the watershed is within the Western Cornbelt Plains ecoregion. The Vermillion River, from which the watershed sources its name, meanders for 28 miles from the southeastern corner of Scott County in an area that was historically hardwood forest, to the northeast where it reaches the falls at the City of Hastings. From here, the river splits into the Vermillion Slough and the continuance of the Vermillion River. The Vermillion Slough periodically flows north a short distance to the Mississippi River from the falls at Hastings, while the river itself continues another 20 miles south before draining into the Mississippi River near the City of Red Wing. From the headwaters to the mouth of the Vermillion River, there is a 420-foot elevation change with an abrupt 90-foot drop at the falls in Hastings.

The river supports a naturally reproducing population of brown trout. Rainbow trout have been stocked as a harvestable trout species. Brook trout have also been stocked in hopes of establishing a naturally reproducing population of this native species. The Vermillion River provides unique areas of ecological value, with Scientific and Natural Areas (SNAs) along its reaches.

Dakota County has also established County Park Conservation Areas (CPCAs) along the Vermillion River. CPCAs reserve areas of natural quality and areas with high potential for restoration. All CPCAs have a provision for public access. The Vermillion River Mainstem has 185.74 acres of CPCAs.

South Creek

South Creek and its tributaries flow from the southeastern part of the City of Lakeville where they join the Vermillion River in the City of Farmington. Records from 1855 illustrate that South Creek historically existed as a relatively short, very sinuous stream.

In 1999, the MNDNR conducted an assessment of South Creek and its tributaries and found that much of the 10.8-mile creek had been straightened and channelized or ditched. During the DNR's assessment, channel stability scores found the stream and its tributaries to range from fair to good. Riparian vegetation consisted of woody species with limited grasses and forbs. South Creek is a DNR-designated trout stream. During the assessment, three of the five reaches contained brown trout, but the habitat was found to be less than optimal.

The VRWJPO funded further assessment on South Creek and its tributaries in 2010. This study confirmed that the stream is primarily straightened and ditched through agricultural fields, industrial and commercial complexes and housing developments. These practices have impacted its geomorphology, channel stability, riparian zone and habitat. The stream presents opportunity for improvement due to the coldwater status and the VRWJPO continues to invest in restoration along its reaches.

Dakota County has also established CPCAs along South Creek. There are currently 66.34 acres of CPCAs.

South Branch Vermillion River

The South Branch Vermillion River is a coldwater stream starting just south of the City of Farmington that feeds the Vermillion River's mainstem. It flows through a primarily agricultural landscape, though the DNR has been acquiring land along the South Branch in an effort to protect the known trout stream. The stream flows north, passing the Hampton Woods Wildlife Management Area (described later in this plan) before meeting with the main stem of the Vermillion River at 200th St.

The South Branch Vermillion River is home to a naturally reproducing brown trout population. Rainbow trout have been stocked over the years, but the stream has not yet been able to support this native trout species. Various restorations along the stream have improved spawning, feeding and hiding habitat for fish by building riffles and adding woody material along the banks.

Middle Creek

Middle Creek and its tributaries are 24.5 miles long with the majority of flow within the middle and eastern portions of the City of Lakeville. Middle Creek flows through the north- and west-central portions of Farmington and into the Vermillion River at State Highway 3 in the City of Empire. The headwaters were historically marsh and wetland surrounded by prairie and limited forest. Agriculture and residential development have resulted in drained wetlands, channel straightening, added impervious surface subsequently reducing infiltration rates of the surrounding landscape, and reduced the amount of riparian buffer along the stream banks.

The lower reaches of Middle Creek are DNR-designated trout stream. Groundwater is near-surface in some of these areas, presenting the potential to increase the amount of cold and coolwater habitat.

North Creek

North Creek flows eastward through Lakeville, turns southeast on the eastern extent of the Cities of Lakeville and Farmington until it

meets with Middle Creek in the City of Empire. Much like Middle Creek, the headwaters of North Creek were historically identified as marsh or wetland, covered by expanses of forest or prairie. Stream channels were shorter and naturally sinuous prior to the 1950s, after which most channels were converted into ditches and incised perennial waterways for agricultural purposes. Presently, much of the land surrounding North Creek and its tributaries are within residential development. The increase in water flow to the stream, resulting from the addition of impervious surfaces and reduction in natural vegetation, has resulted in stream erosion and channel incision.

Dakota County has also established a CPCA along a tributary to North Creek, which is 10.40 acres in size.

Lake Marion

Lake Marion is a 530-acre lake located in the City of Lakeville along the Interstate 35 (I-35) corridor. It has a maximum depth of 21 feet. The lake is split by I-35, with the portion of the lake on the west side of the I-35 shallower than the portion on the east side of the I-35. The west portion of the lake is locally coined as the "kidneys of the lake," with prevalent aquatic vegetation and limited surrounding development acting to provide a lake safeguard.

Lake Marion boasts many amenities including a public boat launch, two fishing piers, 10.17 miles of shoreline, a large swimming beach and a 5-mile-long mountain bike trail. Ritter Farm Park, a 340-acre natural area, is adjacent to the west side of the lake, and includes an environmental learning center, several acres of prairie and woodland restoration, and an extensive trail system used for hiking, cross-country skiing and horseback riding.

Fish populations within the Lake are dominated by average sized Northern Pike, Largemouth Bass and Bluegill Sunfish. Walleye fry are annually stocked by the DNR, but abundance remains low. Invasive Eurasian watermilfoil, curlyleaf pondweed, and zebra mussels are found within the lake.

Alimagnet Lake

Alimagnet Lake is a 102-acre lake located in the Cities of Burnsville and Apple Valley southeast of I-35E. It has a maximum depth of 11.5 feet with an average depth of 6 feet, earning it the classification of a shallow lake. It has a watershed area of approximately 985 acres which is dominated by residential and commercial development.

The lake is directly adjacent to Alimagnet Park, a 220-acre recreational area that includes extensive oak woodland, nearly two miles of shoreline, a public canoe launch, disk golf course and nature trails.

Fish populations are dominated by bluegill sunfish, black bullheads, and black crappies. Invasive Eurasian watermilfoil and curlyleaf pondweed are found within the lake.

Long and Farquar Lakes

Long and Farquar Lakes are hydrologically connected shallow lakes located within the City of Apple Valley. Long Lake, which drains directly to the eastern Farquar Lake, is just south of the intersection of County Road (CR) 31 and CR 33. The lakes are 34 acres and 67 acres in size, respectively. Average depths are below 5 feet. Nearly half of Farquar Lake's 2,100-acre developed urban watershed is routed through Long Lake before entering Farquar.

Long Lake is primarily used for nonmotorized boating and wildlife habitat. The lake is publicly accessible on the west side of the lake through the City of Apple Valley's Long Lake Park but is not accessible by vehicles. Farquar Lake is publicly accessible with a fishing pier located within the City's Farquar Lake Park.

Due to shallow lake depths, both lakes are susceptible to annual fish winterkills. Fathead minnows, black bullheads and bluegills have been historically observed in the lakes. The non-native curlyleaf pondweed grows at nuisance levels in both lakes.

Cobblestone Lake

Cobblestone Lake is a created stormwater facility with a surface area of 37 acres and a maximum depth of 21 feet. The lake was developed from a former mining pit area. It is located in the southeast portion of the City of Apple Valley at the intersection of CR 46 and CR 33. Water levels within the lake are controlled by a lift station, which pumps outflow into the City of Lakeville's storm sewer system. However, the pump is rarely operated (except for standard maintenance) due to seepage losses to groundwater. The entire Cobblestone Lake shoreline is owned by the City of Apple Valley. A walking trail exists around the lake and a fishing pier is located near on the north.

Cobblestone is a part of the DNR's Fishing in the Neighborhood initiative, which is a program aimed at increasing angling opportunities, public awareness and environmental stewardship within the seven-county metro region. Recreators will find bluegill, black crappie, walleye, and bullheads within the lake.

Valley Lake

Valley Lake is an eight-acre lake located in the City of Lakeville near the intersection of CR 46 and CR 23. Prior to its lake designation, it was a historic gravel pit. It has a watershed drainage area of 117 acres and a maximum depth of 10 feet. It outlets to the south toward North Creek.

Valley Lake Park surrounds the lake, offering recreators walking trails and a fishing pier. There is a limited diversity of fish species but includes a proliferation of bluegills and black crappies. The invasive Eurasian watermilfoil is present within the lake.

East Lake

East Lake is a 42-acre lake located within the City of Lakeville south of CR 46. It has a maximum depth of 10 ft and an average depth of 4 ft. Its large, 11,579-acre watershed drains land across six separate municipalities and townships including: Burnsville, Eagan, Apple Valley, Lakeville, the City of Empire and Empire Township. The lake was historically a farmed wetland, but as urban development advanced, more water was directed to the area changing it from more wetland-like to lake-like.

The lake has approximately 1.75 miles of shoreline, all of which is owned by the City of Lakeville. To the northwest of the lake sits 18 acres of oak savannah bordered by a 1-acre historic prairie restoration. On the west side of the lake runs the North Creek Greenway, which is a 3.2-mile stretch of a regional trail connecting Lebanon Hills Regional Park to the Minnesota Zoo and south into Apple Valley. The lake outlets south to a tributary to North Creek.

Common carp and goldfish are abundant in East Lake. Black bullheads and black crappies are also found in high numbers. Historically, aquatic vegetation has been absent in the lake.

Mississippi River

The Mississippi River has limited extent in the furthest northeastern section of the watershed. Along its extent, the Mississippi River is managed by the Mississippi River Corridor Critical Area Program (MRCCAP). The MRCCAP is a joint state, regional, and local program that provides coordinated land use planning and zoning regulations for the 72-mile stretch of the Mississippi River through the seven-county metropolitan area (*see Figure B-27*).

While Figure B-27 shows the Vermillion River connecting with the Mississippi within Hastings, the image is simplified. As previously mentioned, while the Vermillion River has connection to the Mississippi in this location by way of the Vermillion Slough, the river itself continues south until it drains into the Mississippi near the City of Red Wing.

The Mississippi Lock and Dam system has created a chain of backwater lakes within the watershed that are described below.

Spring Lake

Spring Lake is a backwater lake of Pool 2 of the Mississippi River 3 miles upstream of the dam at Hastings. Prior to the flooding of the Mississippi River in the 1930s (from Lock and Dam #2 at Hastings), the lake consisted of a diverse mix of river floodplain, forest, marsh and scattered oak savanna. Its name pays homage to the historic trait of a portion of the area being a naturally spring-fed lake. During present day, the lake acts as a slack-water pool that regularly fills with sediment and needs continual dredging to maintain an open navigation channel.

Spring Lake receives little fishing and recreation pressure due to limited accessibility, shallow water, and an abundance of snags.

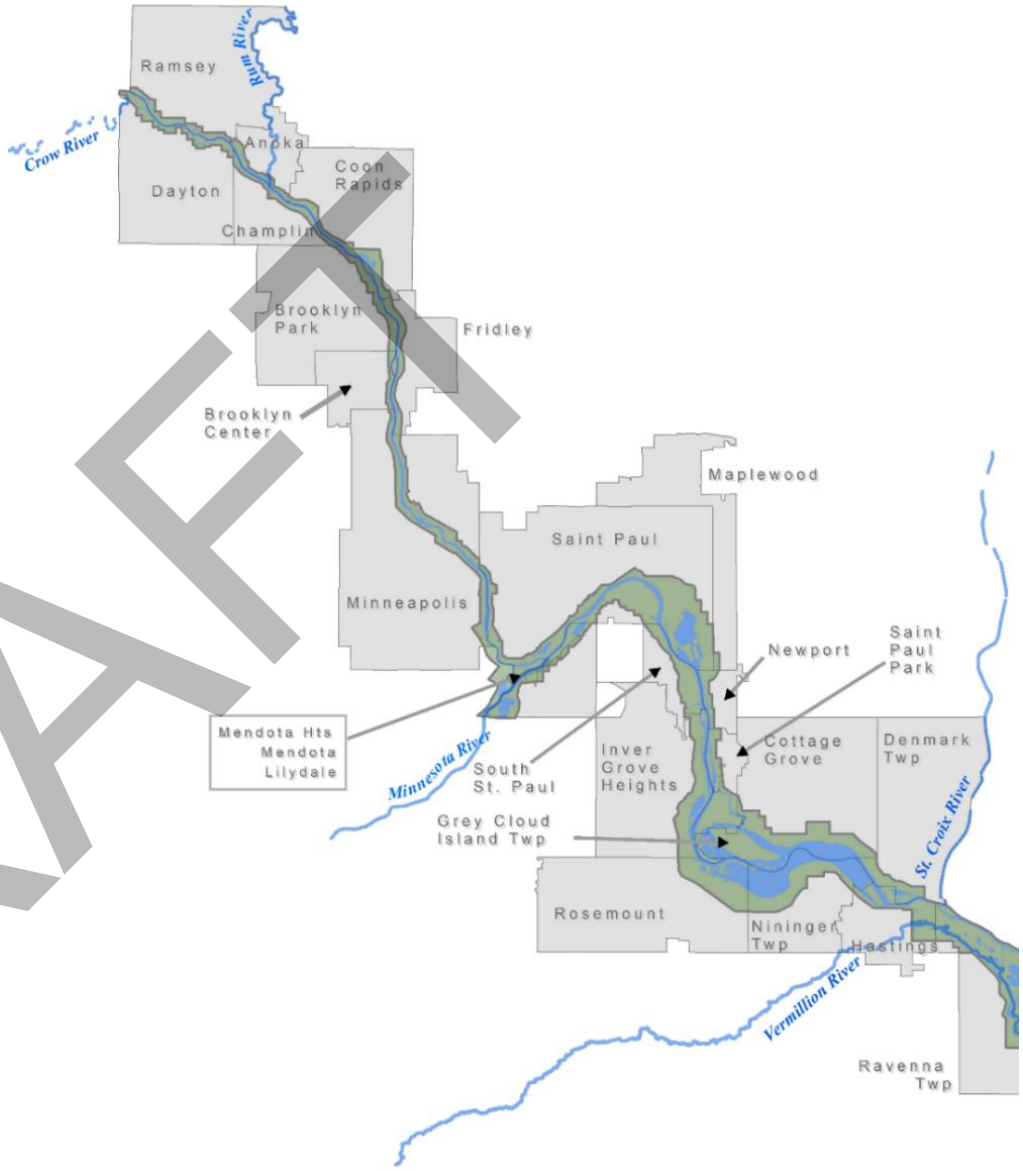


Figure B-27: Twin Cities Metropolitan Mississippi River Corridor

However, Dakota County has dedicated resources to restore the area surrounding the lake. Spring Lake Park Reserve is adjacent to Spring Lake and the surrounding bluffs of the Mississippi River. It is a 1,097-acre reserve located in Nininger Township, just west of the City of Hastings. The natural area features river terraces and steep limestone and sandstone bluffs that support rare natural communities. Spring ephemeral wildflowers present beneath the preserve's forest canopies and remnant prairies occur sporadically across the bluff. Much of the central and eastern portions of the park were ranked as having "high biodiversity significance," by the Minnesota Biological Survey in the 1990s.

The park landscape has great significance to the history, cultural identity, spirituality, and lifeways of the Dakota Oyate as a place where the ancestors of today's associated Indigenous communities lived and are buried. A cultural landscape analysis conducted by the Upper Sioux Community Tribal Historic Preservation Office for the 2021 Spring Lake Park Reserve Master Plan surveyed culturally sensitive sites associated with Indigenous occupation and use dating as far back as 10,000 BCE. The survey notes that "the boundaries of Spring Lake Park Reserve encompass numerous highly sensitive Traditional Cultural Properties of importance to the Dakota people and their ancestors."

Lake Isabelle

Lake Isabelle is a 95-acre shallow lake in the northeast section of the City of Hastings. It has an average depth of 5 feet and a maximum depth of 7 feet. A boat launch and fishing pier add recreational value. Fish species in the lake include northern pike, crappies, panfish, and bass. Adjacent to the lake is Lake Isabel Park, which was newly renovated in 2024.

Lake Rebecca

Lake Rebecca is an 82-acre oxbow lake adjacent the Mississippi River in Hastings. It has 3.6 miles of shoreline and a maximum depth of 15 feet. The entire shoreline is in public ownership and the lake has surface water restrictions limiting boaters to the use of electric motors only.

Lake Rebecca Park is a 130-acre community park that is a part of the Mississippi National River and Recreation Area corridor. It is located in the City of Hastings between Lock and Dam Road and Lake Rebecca. Within the park is a strip of restored prairie called the Flint Hills Resources Riverfront Nature Preserve.

During high water events, Lake Rebecca often becomes hydrologically connected to the adjacent Mississippi River. Due to this characteristic, the lake contains many species typically associated with riverine systems, including sauger, white bass, freshwater drum, and catfish species. The lake is managed as a northern pike-crappie lake, with catfish stocked regularly.

Scott County Ditch 12

County Ditch 12 (CD 12) in Scott County is the only public drainage ditch that was regulated by MN Statute 103E during the previous generation Watershed Management Plan. The ditch was constructed in 1956 in the southeast portion of Scott County and runs 5.17 miles in length. There are two branches associated with CD 12, draining approximately 6,900 acres; however, the most recently assessed benefits role includes approximately 1,561 acres of watershed, representing only a fraction of the total drainage area. Historically, the Scott SWCD coordinated ditch inspections.

In 1972, 1975, and 1985, Scott County received petitions for repairs of CD 12. The repairs were not approved by the Drainage Authority due to wetland impacts. In accordance with MN Statute 103E.811 Subd. 2, a petition for abandonment of a public drainage ditch must be signed by at least 51 percent of the property owners assessed for the construction of the drainage system or by the owners of not less than 51 percent. On October 10, 2024, Scott County staff mailed letters to all benefited owners of CD 12. Benefited owners of 816.05 acres (52 percent) voted to abandon the ditch.

On April 15, 2025, a public hearing was held during a Scott County Board of Commissioners meeting to hear comments relating to the ditch abandonment. One public comment was received, resulting in another landowner providing their desire for ditch abandonment. Resolution No. 2025-122: Adopting Findings and an Order Granting a Petition Abandoning Scott County Drainage Ditch No. 12 passed.

B-7 Monitoring

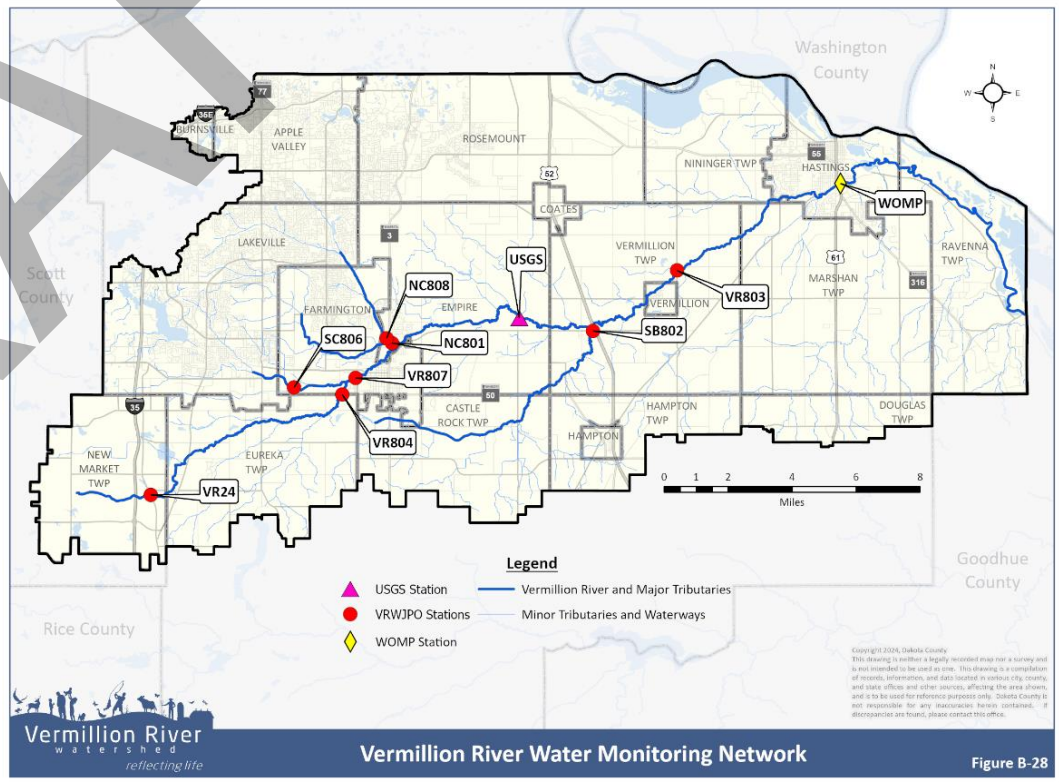
The VRWJPO supports physical and chemical monitoring of streams; fish and macroinvertebrate assessments; stream flow gaging; and BMP efficacy monitoring. Lake monitoring is done as a part of the Metropolitan Council's Citizen-Assisted Monitoring Program (CAMP) with support from partner LGUs and volunteers.

Detailed annual monitoring reports can be found on the VRWJPO website. Following is an outline of monitoring activities and locations supported by the VRWJPO.

Water Quality Monitoring – Vermillion River Monitoring Network

From March-October of each year, the VRWJPO conducts physical and chemical monitoring of stream sites in coordination with the DCSWCD and SSWCD, through the VRMN. A map of sites monitored in the watershed can be found in *Figure B-28*.

In addition, the Table B-5 illustrates these sites as well as the years in which monitoring has been conducted. The VRMN was established to collect water quality and quantity data and define pollutant loading trends in the VRWJPO. The data enables VRWJPO staff to make informed water management decisions based on sound science.



The monitoring network contains cold (2A) and warm (2B) water stream reaches, each holding its own state water quality standards. In Minnesota, 2A streams are protected as potential drinking water sources. Historically, the VRWJPO has petitioned to change 2A stream reach designations or establish site-specific standards, as historical data may suggest a case for waters not meeting the characteristics of 2A streams.

Table B-5: VRMN Stream Monitoring Stations

Stream Monitoring Site	Site Abbreviation	Subwatershed	Years Monitored
Vermillion River at CR 46	VR24	Upper Mainstem	2000-Present
Vermillion River at I-35	VR12	Upper Mainstem	2006
Vermillion River South of 235th St W	VR809	Upper Mainstem	2005-2010
South Creek at Flagstaff Ave	SC806	South Creek	2011-Present
Vermillion River at 220th St	VR804	Upper Mainstem	2000-Present
Vermillion River at Denmark Ave	VR807	Middle Mainstem	2000-Present
Upstream North Creek at Hwy 3	NC808	Middle Creek	2000-Present
North Creek at Highway 3	NC801	North Creek	2000-Present
South Branch Vermillion River at Cty Hwy 66	SB802	South Branch	2000-Present
Vermillion River at Goodwin Ave	VR803	Middle Mainstem	2000-Present
Vermillion River in Vermillion Falls Park	VR0020	Lower Mainstem	2000-Present

When the VRMN began in 2000, it consisted of eight monitoring stations, with seven stations monitored by DCSWCD staff and the VR24 station being monitored by SSWCD staff. All eight sites were equipped with pressure transducers and data logging equipment, which were installed in spring and removed for the winter. River stage was logged every 15 minutes, and these records were converted to discharge values using annually updated rating curves.

At the VRMN's initiation, base flow grab samples were collected monthly through the growing season. Runoff event samples were also collected after one-inch or greater rain events. Samples were characterized as snowmelt if early season samples were collected with snow on the ground, or if precipitation took place leading to snowmelt. All samples were analyzed according to EPA-specified protocols at the Metropolitan Council's Environmental Services Lab in St. Paul. Analytes included: alkalinity, 5-day biological oxygen demand, conductivity, chloride, dissolved phosphorus, fecal coliform, NO3, nitrite, pH, total ammonia nitrogen, total Kjeldahl nitrogen, TP, TSS, turbidity and volatile suspended solids. Results from sampling were annually reported to the MPCA and EPA and inform local water quality improvement projects.

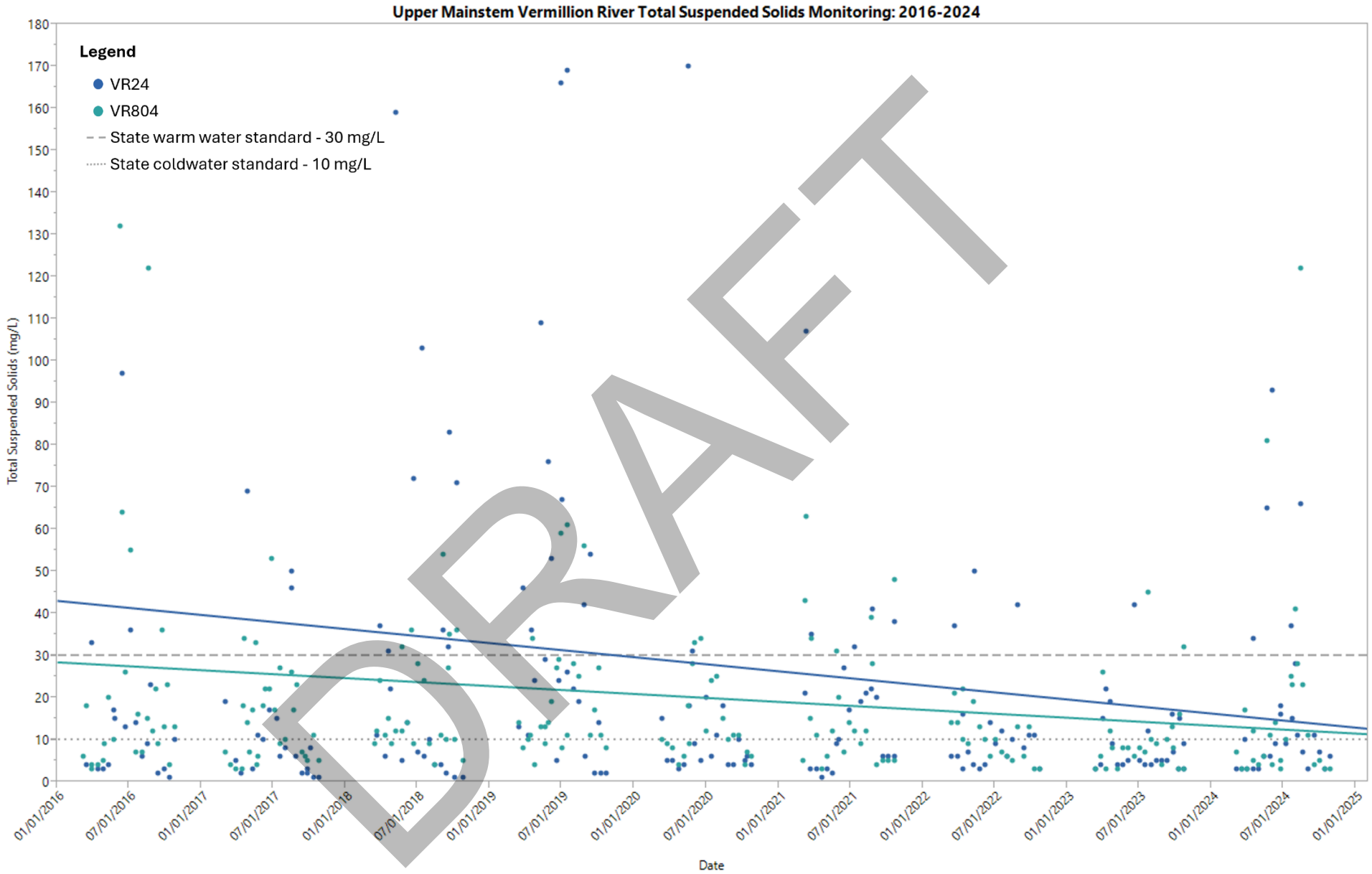
In 2007, an automated weather station was added to the network, located near the center of the watershed to better inform runoff monitoring events. Other notable items include:

- In 2006, the VR12 site was added to assess additional Scott County drainage areas. It was, however, abandoned after one year of monitoring due to access issues.
- In 2009 (and further), sampling transitioned to bi-weekly sampling, as there was a desire to grow the database of baseflow conditions to accurately represent river and stream conditions. Runoff events continued to be monitored as well.
- In 2011, monitoring station VR809 was abandoned due to the river frequently going dry at this location. The monitoring equipment was relocated to the SC806 site, where there was a clear need for additional monitoring data.
- In 2014, the MPCA approved replacement of turbidity standards with TSS standards for the measure of organic and inorganic suspended particles for impairments. As a result of this change, samples were no longer analyzed for turbidity.
- In 2015, continuous stage monitoring equipment was installed by the DNR at the following sites: SC806, VR804, VR807, SB802 and VR803.
- In 2018, DNR installed continuous stage monitoring equipment at the NC801 and NC808 sites.
- In 2019, chloride and chlorophyll a were added to the analyte suite in response to growing concerns for chloride levels in the metro area and the inclusion of chlorophyll a in the MPCA's water quality assessment process for rivers and streams.

With over twenty years of monitoring data, VRWJPO staff established baseline pollutant loading trends and created the ability to determine the impact of various programs and practices implemented within the watershed over time. As previously mentioned, detailed monitoring reports over the full timeframe of the VRMN can be found on the VRWJPO website.

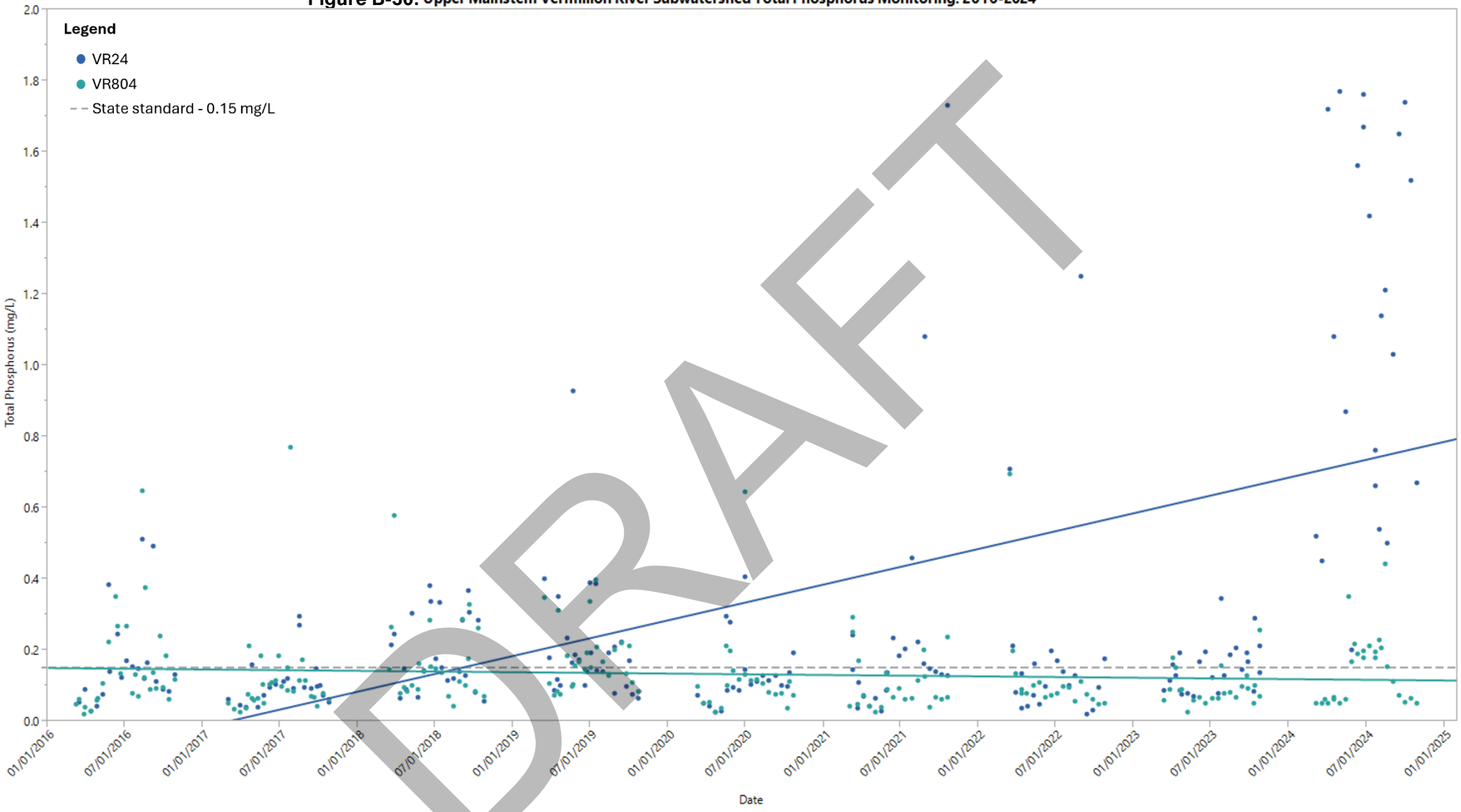
On the following pages, the following can be found:

- Graphs displaying 2016-2024 TSS, TP and NO3 trends organized according to subwatershed. The timeframe of 2016-2024 was selected to illustrate monitoring trends observed during the implementation of the 2016-2024 Vermillion River Watershed Management Plan. Graphs were created using data collected from VRMN stations, organized according to the VRWJPO eight HUC-12 subwatersheds.
- TSS, TP and NO3 pollutant loading maps from 2016-2024. Maps were created using water quality data collected from VRMN stations, with subwatersheds defined using the ArcHydro modeling extension for ArcView GIS, based on MN Lidar elevation data that was converted into a Digital Elevation Model, using the monitoring station locations as pour points.
- Brief discussions of overall monitoring trends prior to and following the implementation of the TSS standard. Trends are discussed in these two timeframes as monitoring protocols varied.



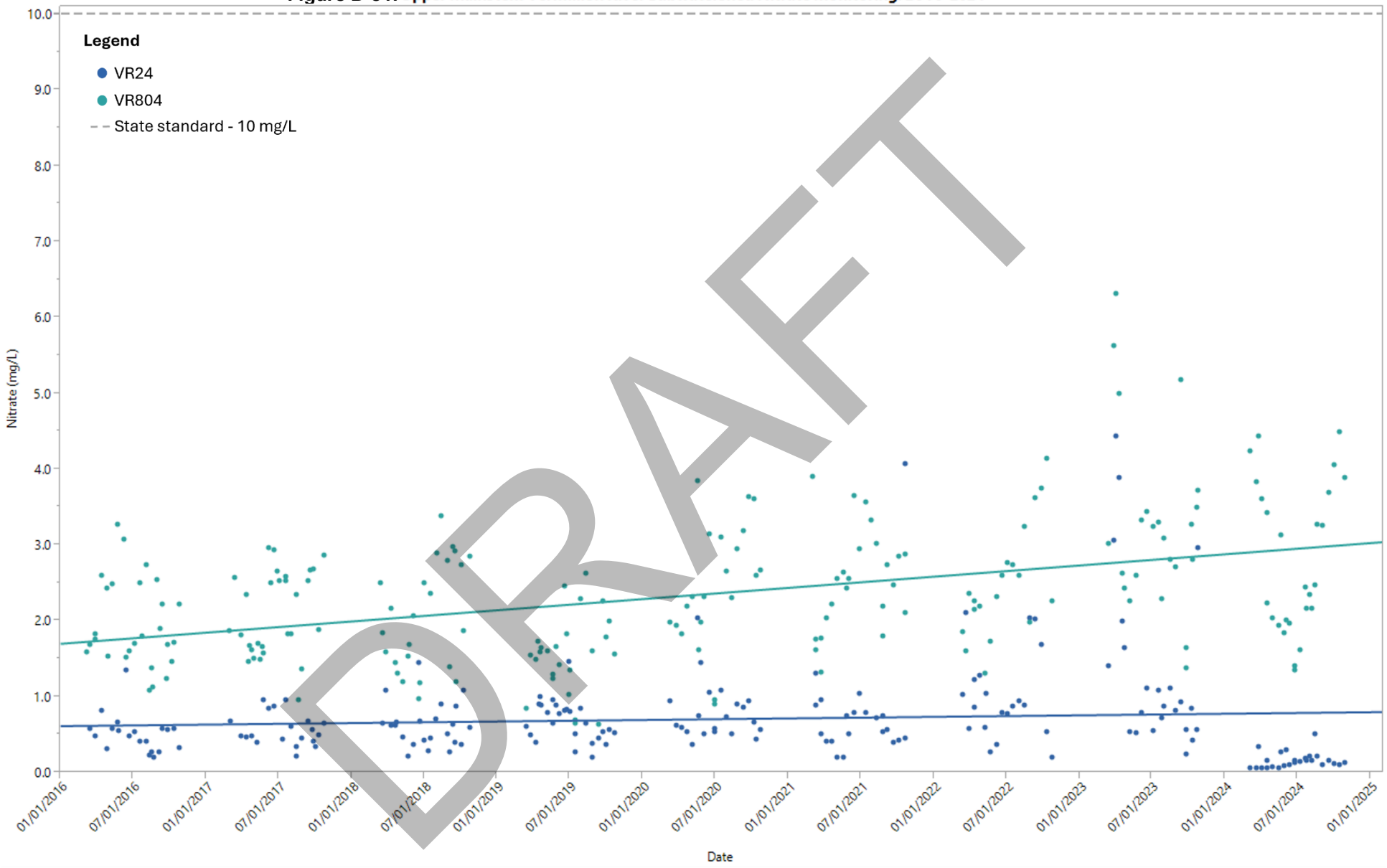
Upper mainstem monitoring for the Vermillion River Monitoring Network is conducted at VR24 (Scott County) and VR804 (Dakota County).

Figure B-30: Upper Mainstem Vermillion River Subwatershed Total Phosphorus Monitoring: 2016-2024



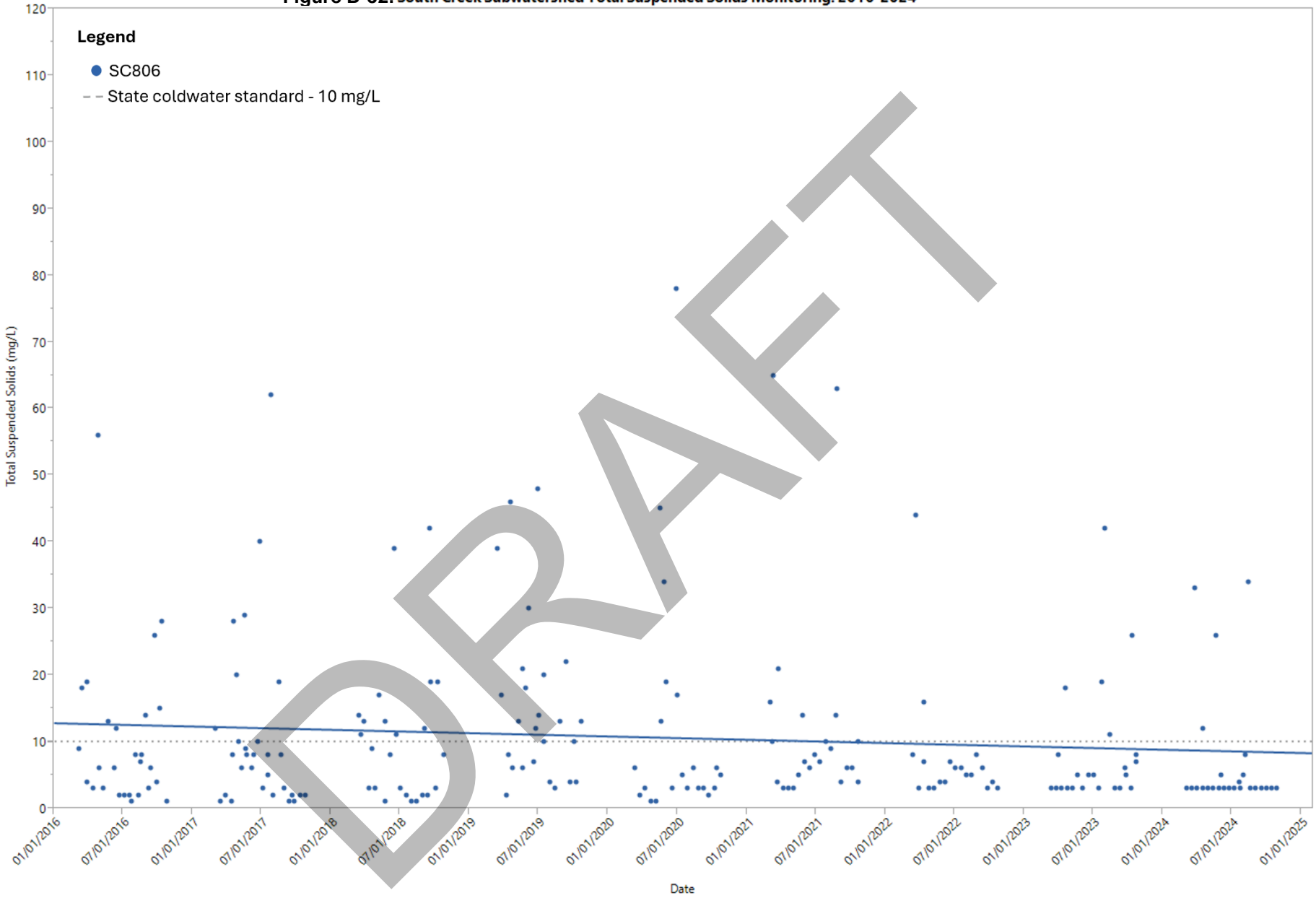
Upper mainstem monitoring for the Vermillion River Monitoring Network is conducted at VR24 (Scott County) and VR804 (Dakota County). **VR24 has four outliers for 2024 - 4.01 mg/L on 3/26/24, 3.64 mg/L on 4/17/24, 3.11 mg/L on 5/22/24, and 3.06 mg/L on 6/3/24.

Figure B-31: Upper Mainstem Vermillion River Subwatershed Nitrate Monitoring: 2016-2024

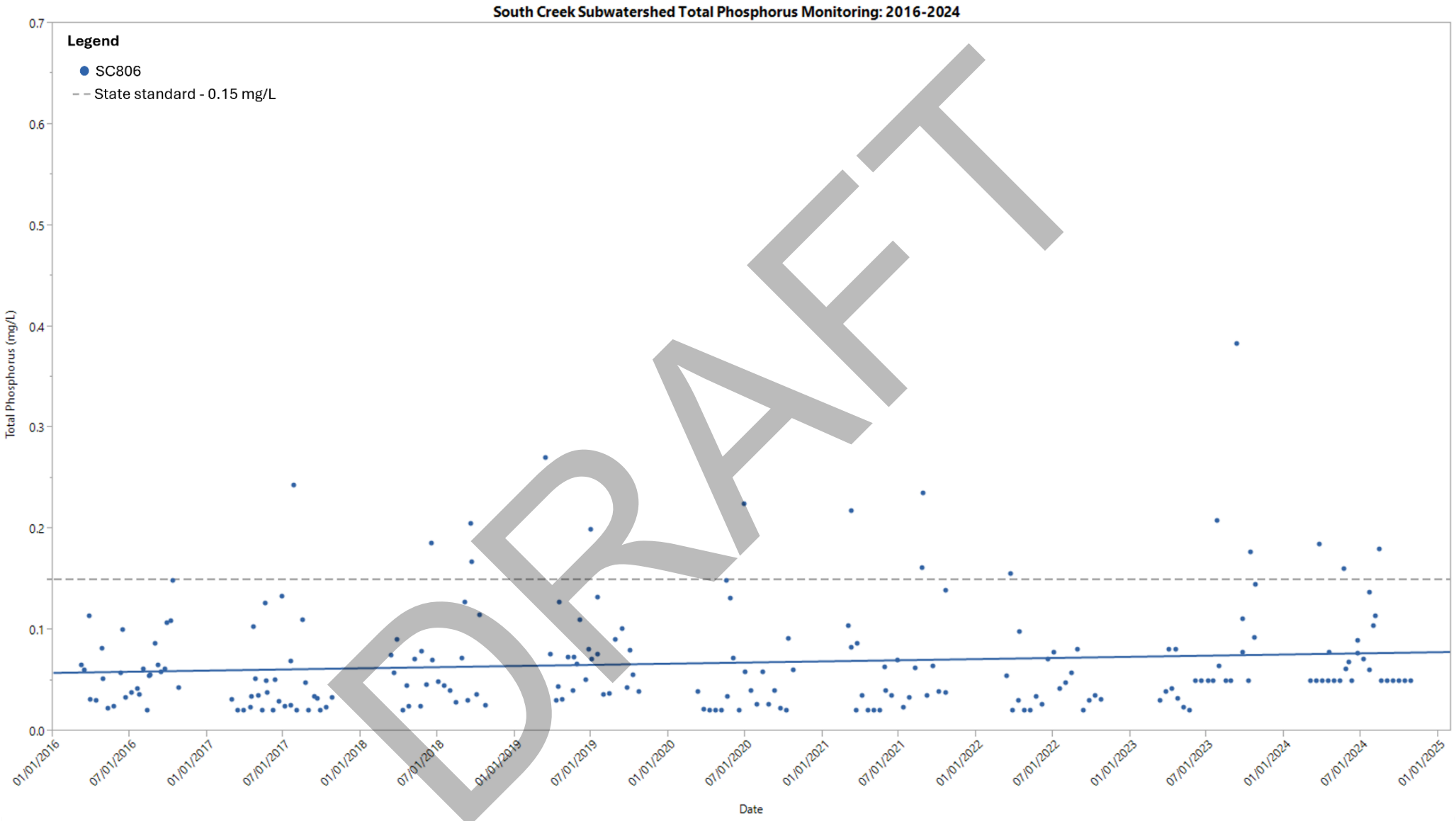


Upper mainstem monitoring for the Vermillion River Monitoring Network is conducted at VR24 (Scott County) and VR804 (Dakota County).

Figure B-32: South Creek Subwatershed Total Suspended Solids Monitoring: 2016-2024

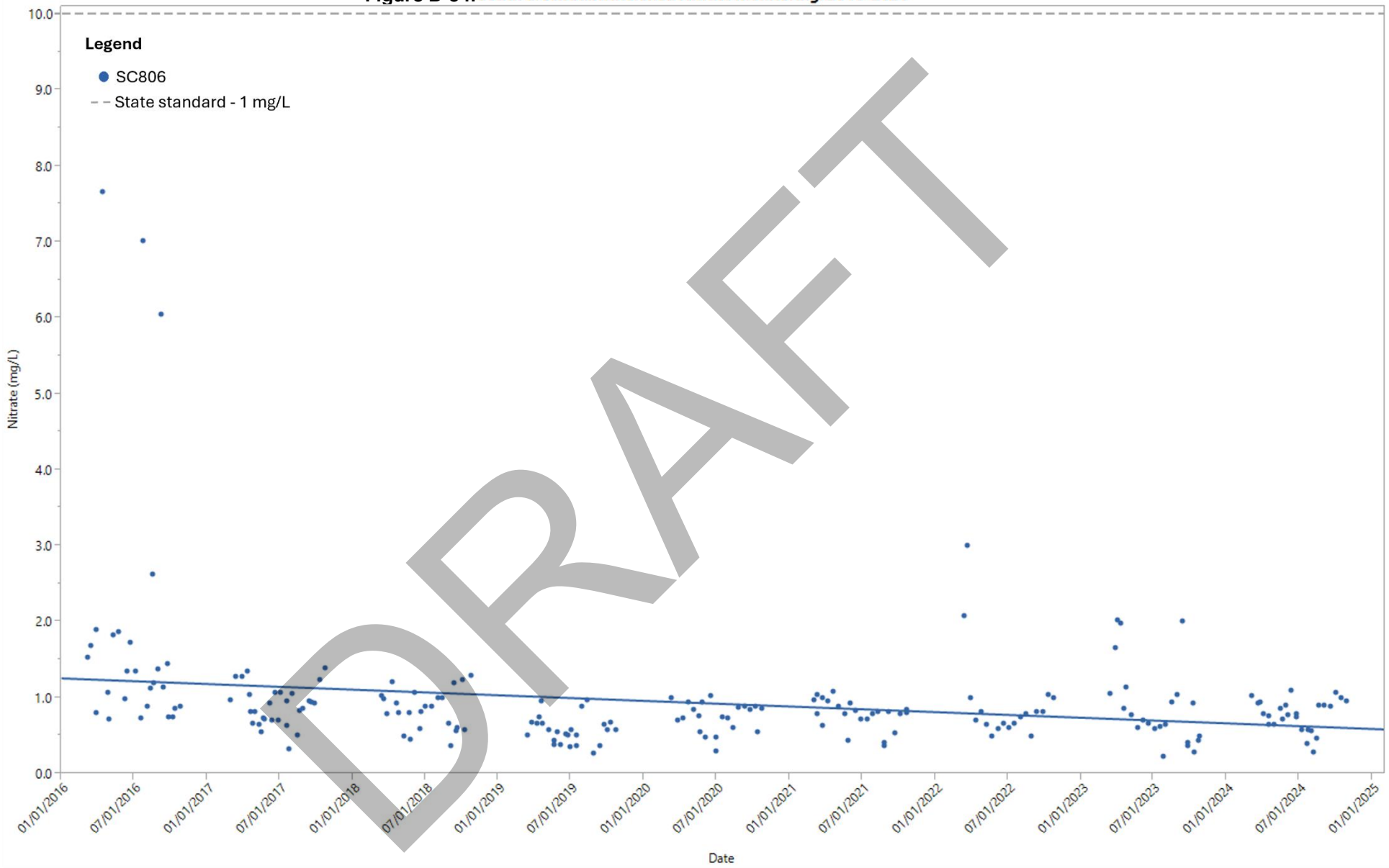


South Creek monitoring for the Vermillion River Monitoring Network is conducted at SC806.



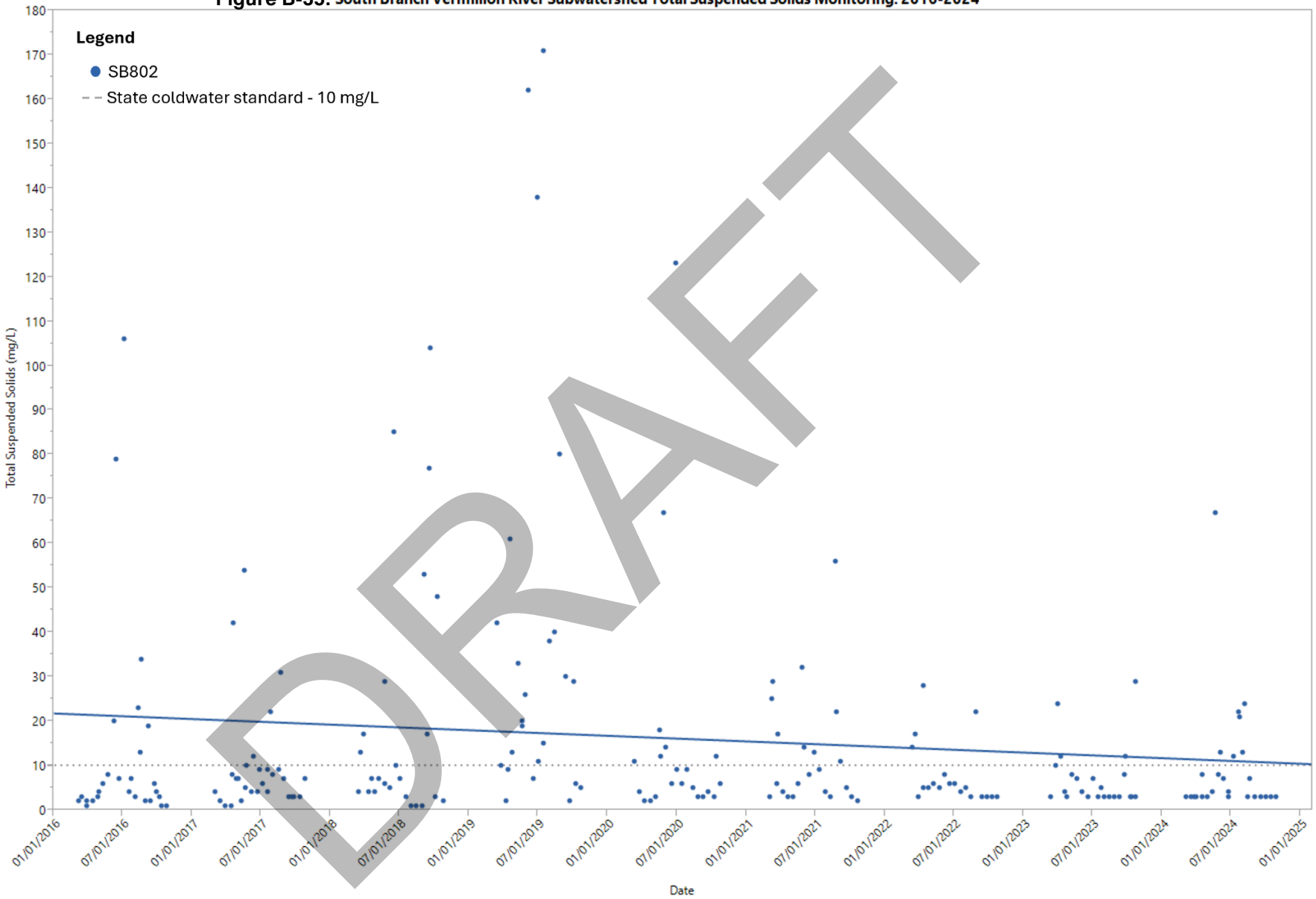
South Creek monitoring for the Vermillion River Monitoring Network is conducted at SC806.

Figure B-34: South Creek Subwatershed Nitrate Monitoring: 2016-2024



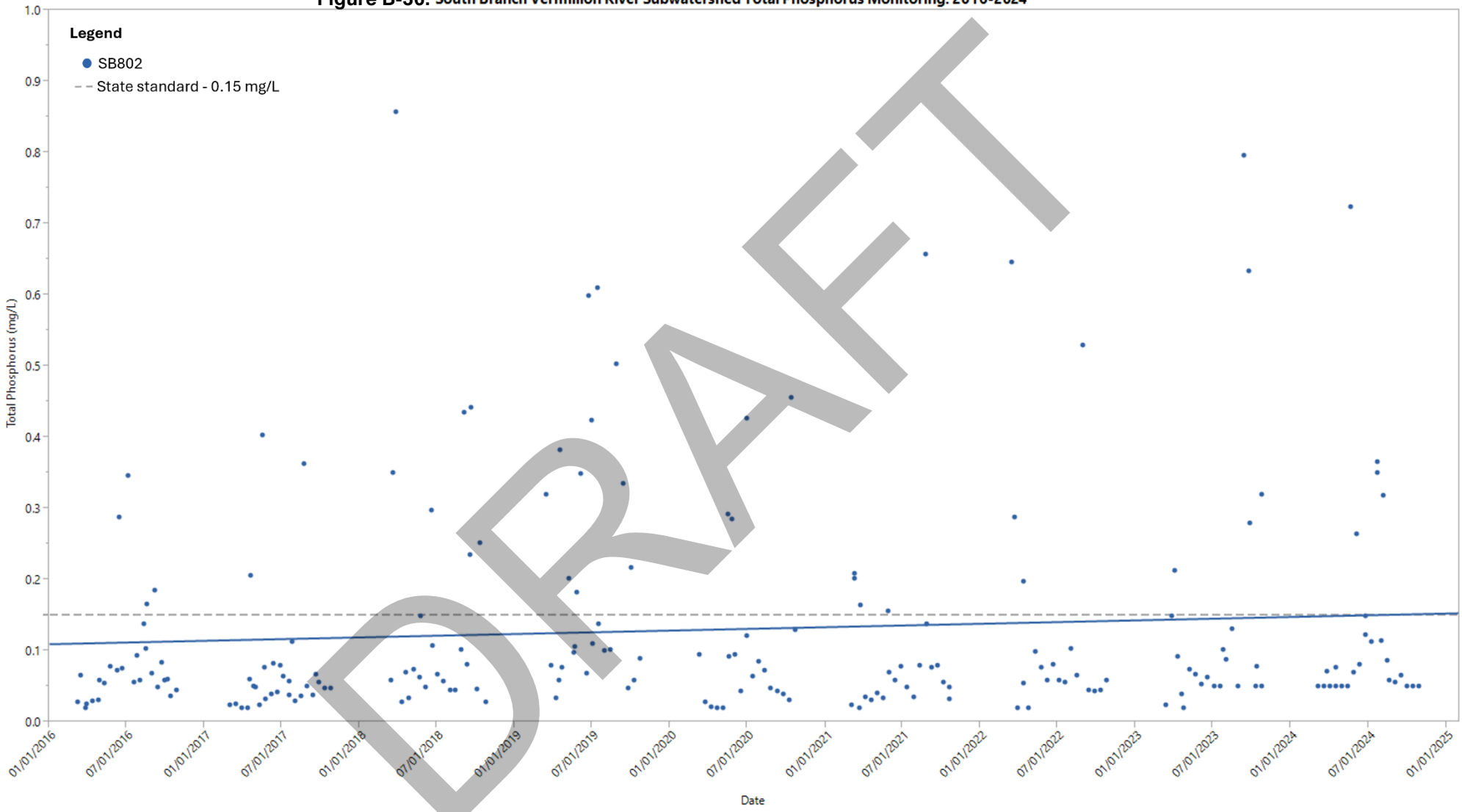
South Creek monitoring for the Vermillion River Monitoring Network is conducted at SC806.

Figure B-35: South Branch Vermillion River Subwatershed Total Suspended Solids Monitoring: 2016-2024



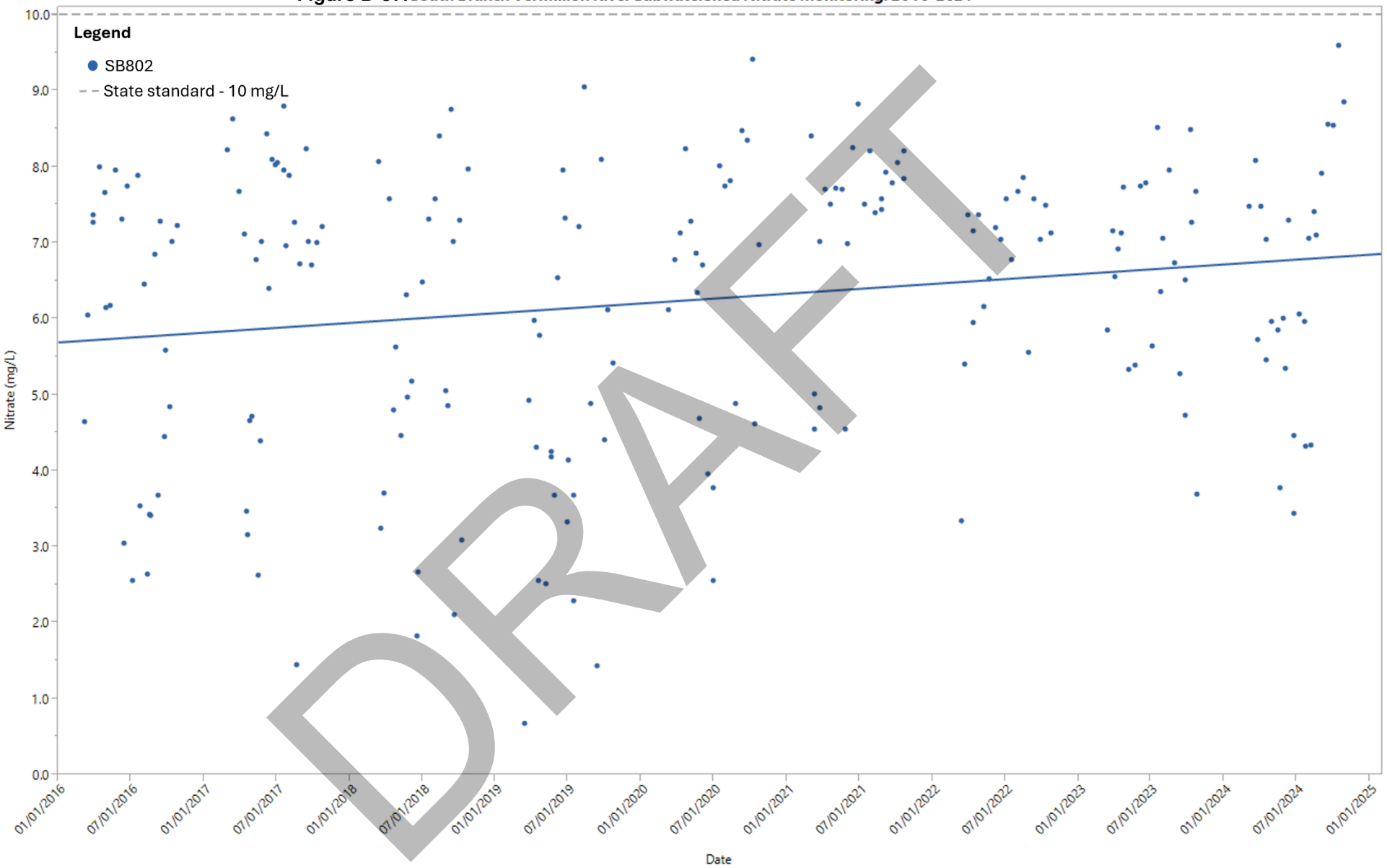
South Branch Vermillion River monitoring for the Vermillion River Monitoring Network is conducted at SB802.

Figure B-36: South Branch Vermillion River Subwatershed Total Phosphorus Monitoring: 2016-2024



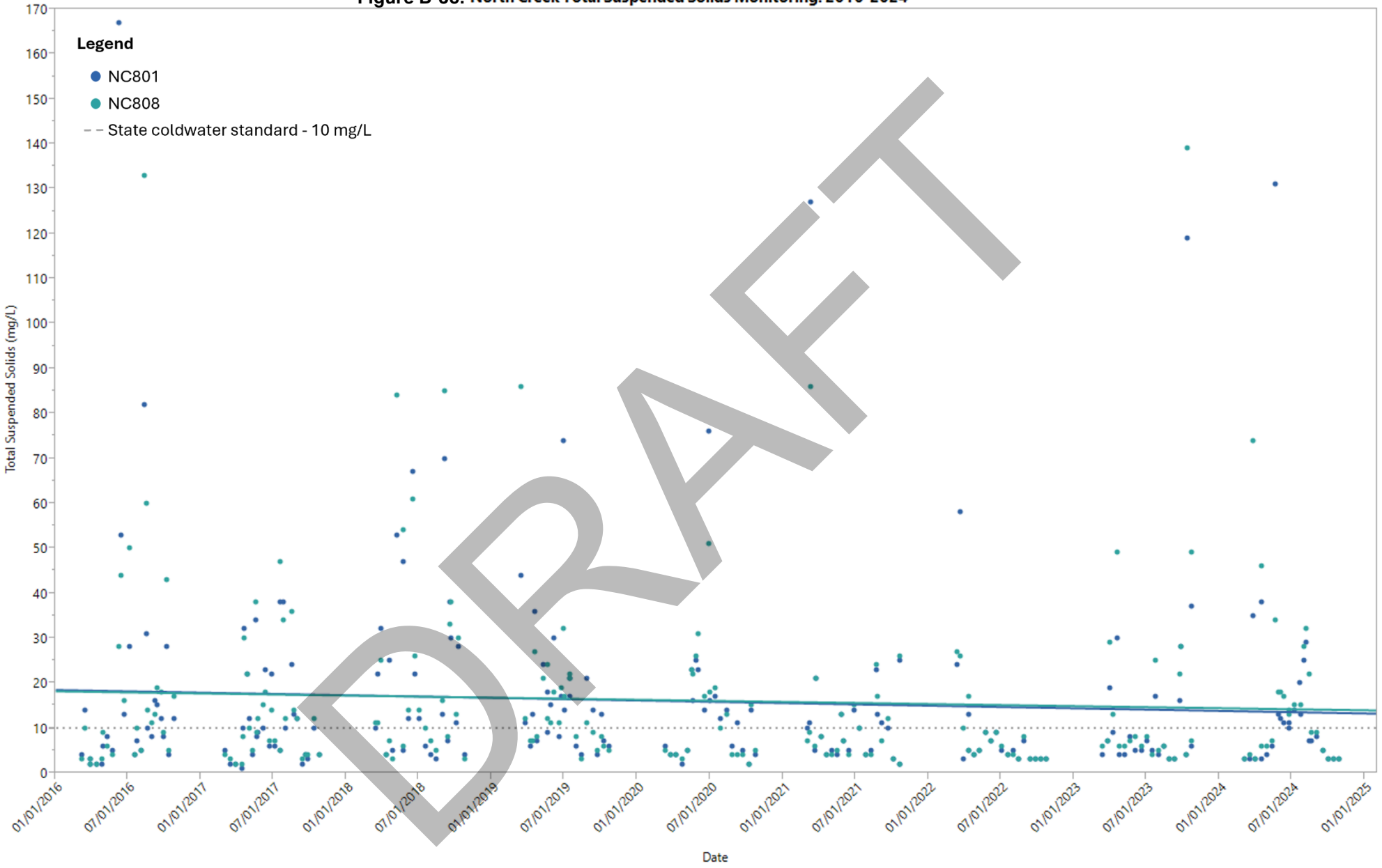
South Branch Vermillion River monitoring for the Vermillion River Monitoring Network is conducted at SB802.

Figure B-37: South Branch Vermillion River Subwatershed Nitrate Monitoring: 2016-2024



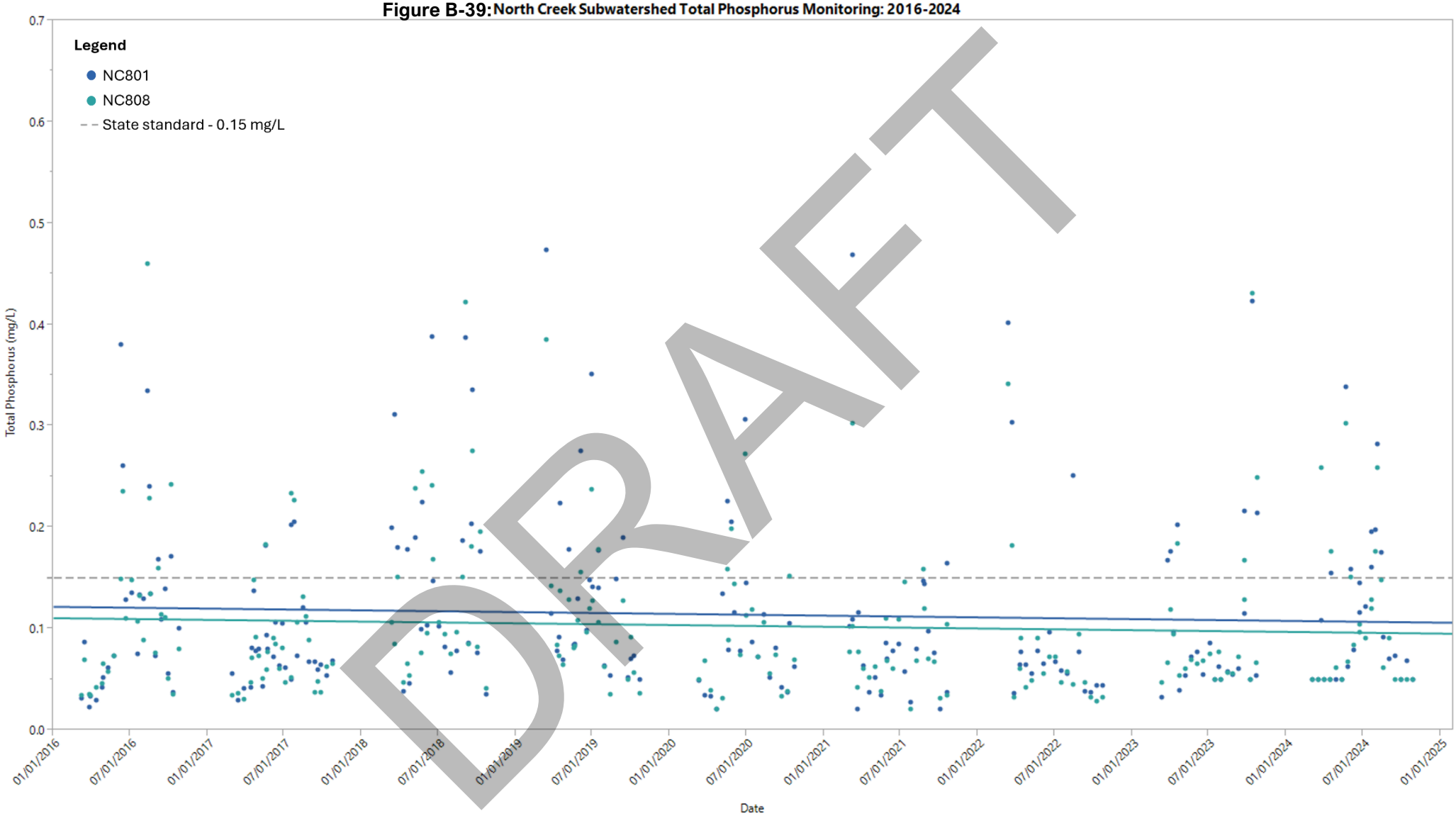
South Branch Vermillion River monitoring for the Vermillion River Monitoring Network is conducted at SB802.

Figure B-38: North Creek Total Suspended Solids Monitoring: 2016-2024



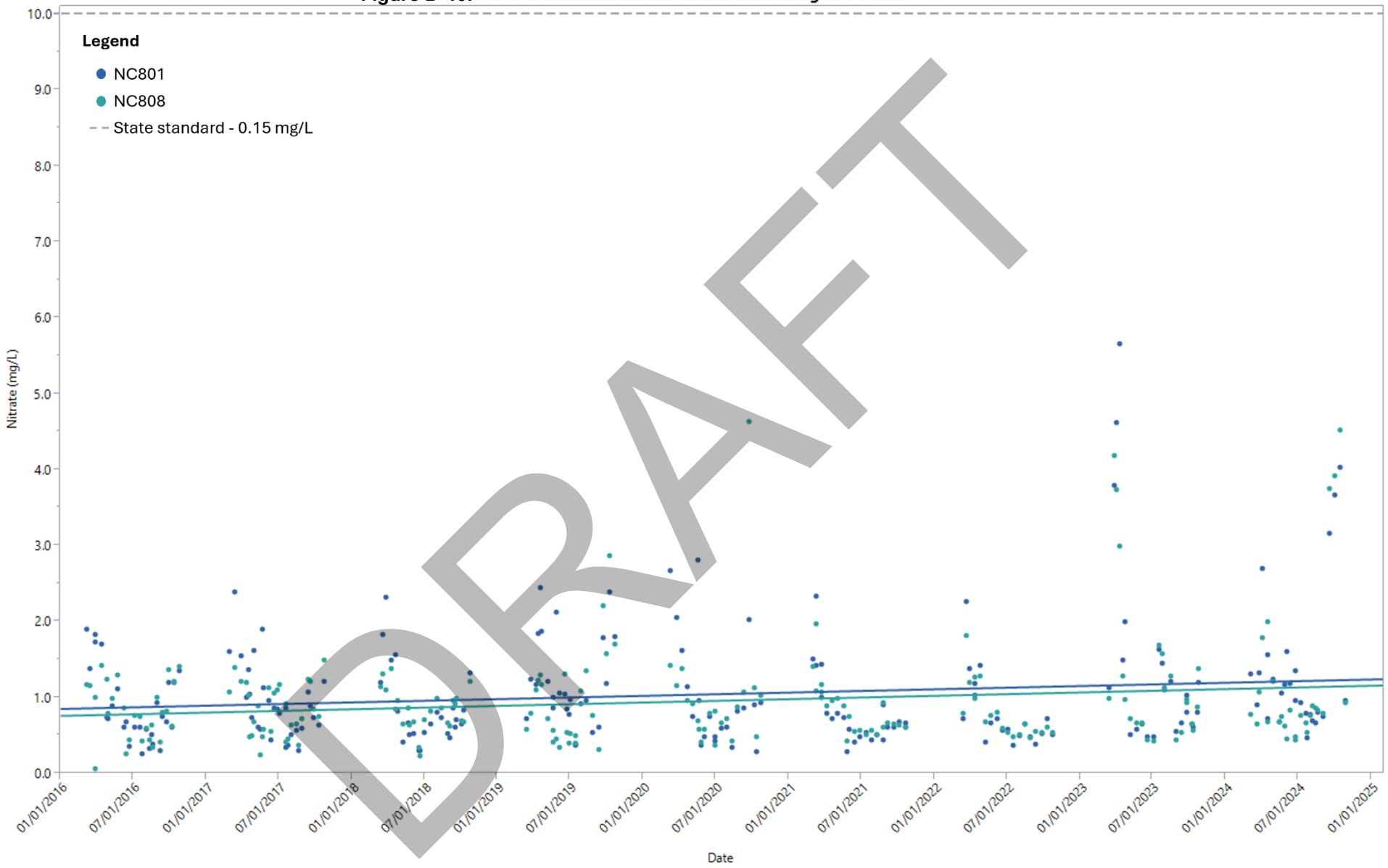
North Creek monitoring for the Vermillion River Monitoring Network is conducted at NC801 and NC808.

Figure B-39: North Creek Subwatershed Total Phosphorus Monitoring: 2016-2024



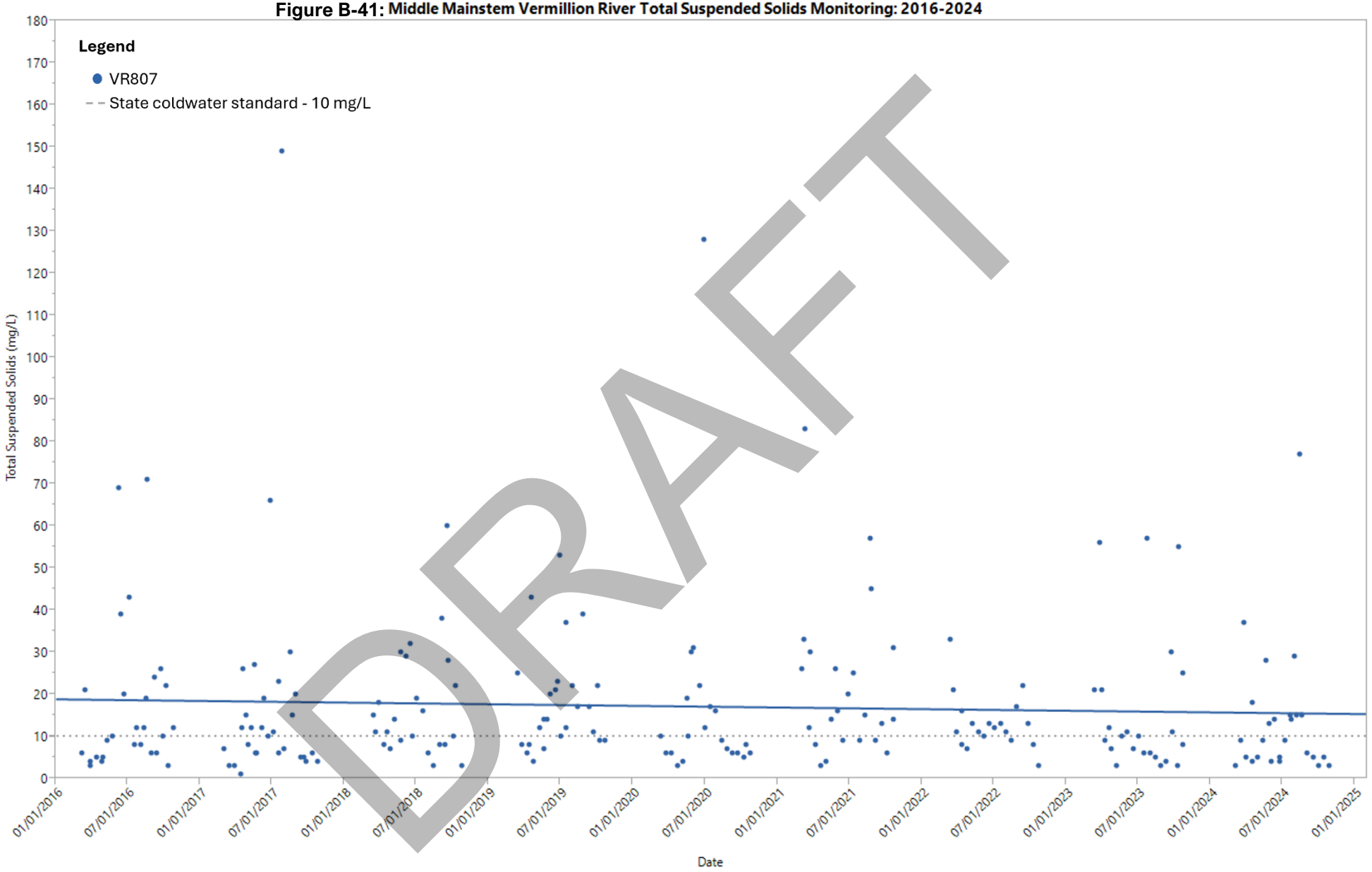
North Creek monitoring for the Vermillion River Monitoring Network is conducted at NC801 and NC808.

Figure B-40: North Creek Subwatershed Nitrate Monitoring: 2016-2024



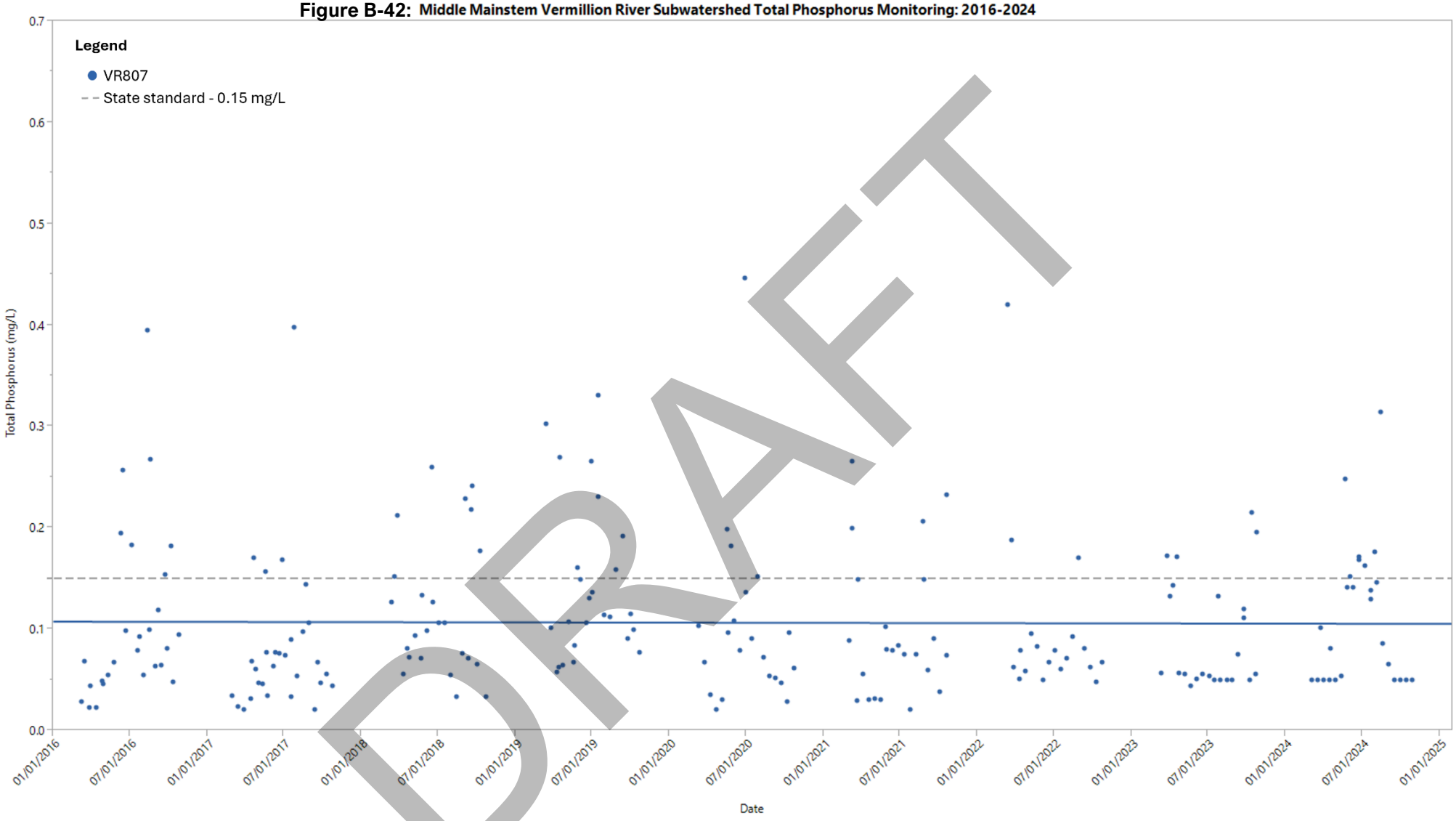
North Creek monitoring for the Vermillion River Monitoring Network is conducted at NC801 and NC808.

Figure B-41: Middle Mainstem Vermillion River Total Suspended Solids Monitoring: 2016-2024



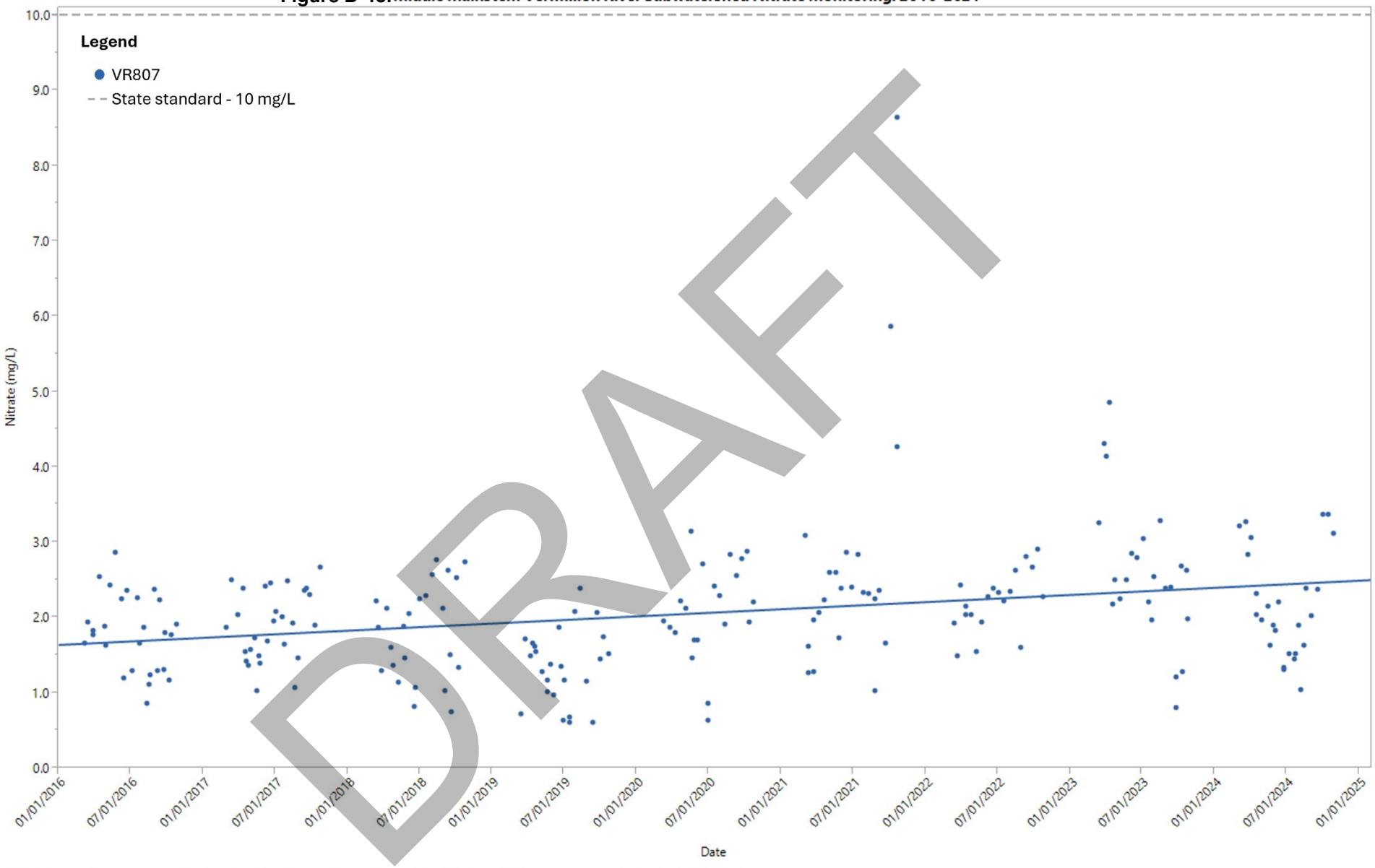
Middle mainstem monitoring for the Vermillion River Monitoring Network is conducted at VR807.

Figure B-42: Middle Mainstem Vermillion River Subwatershed Total Phosphorus Monitoring: 2016-2024



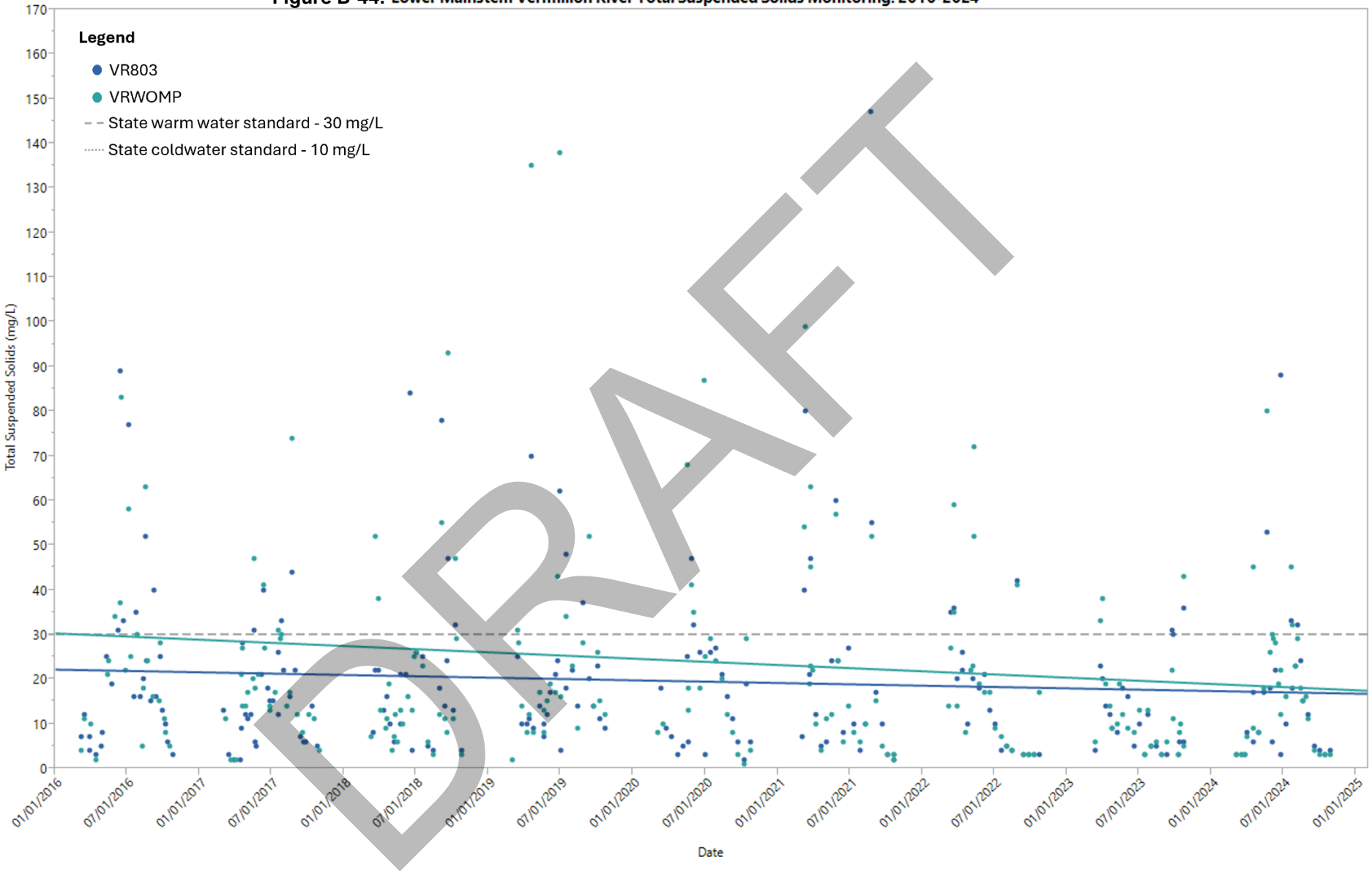
Middle mainstem monitoring for the Vermillion River Monitoring Network is conducted at VR807.

Figure B-43: Middle Mainstem Vermillion River Subwatershed Nitrate Monitoring: 2016-2024



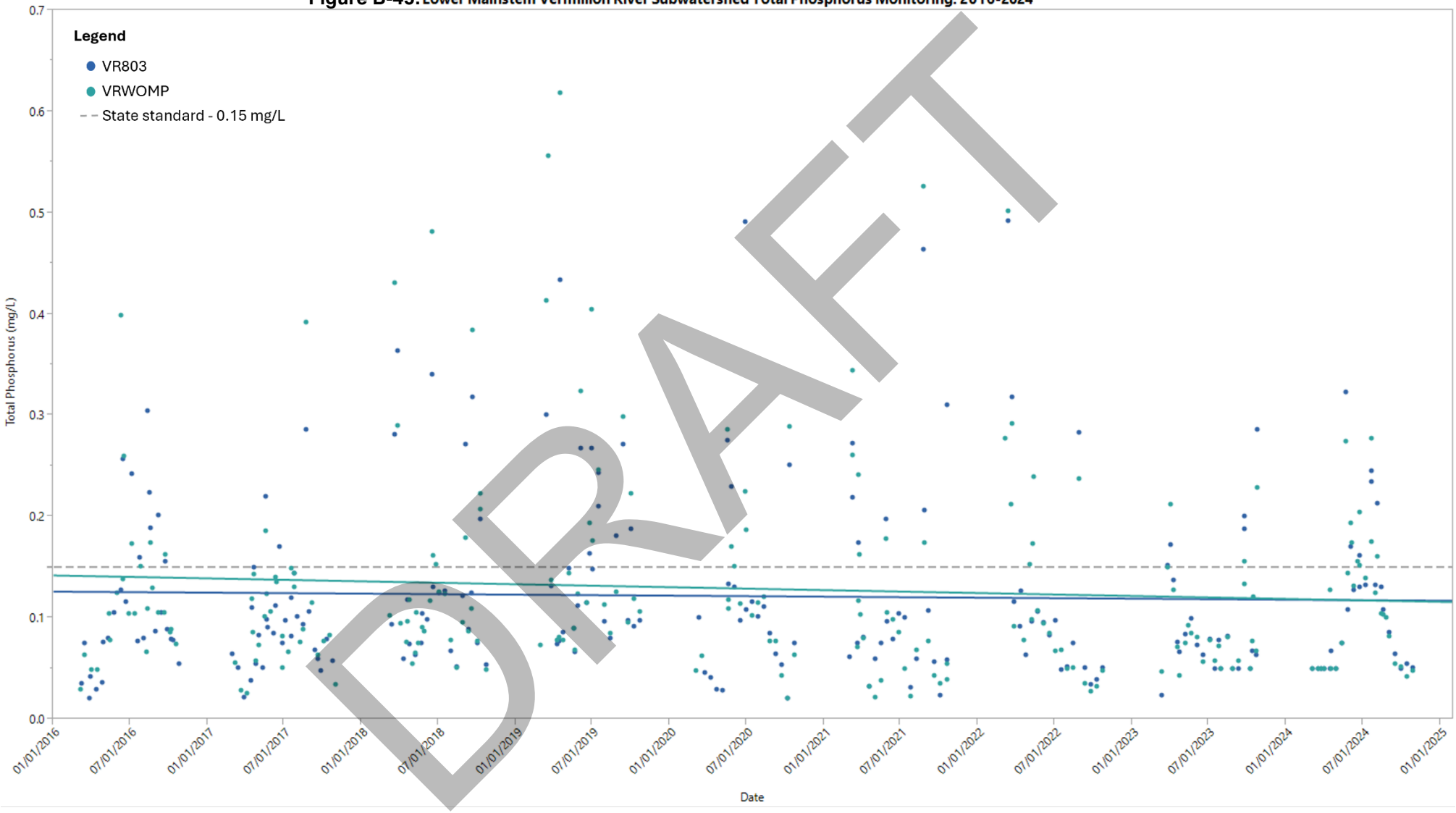
Middle mainstem monitoring for the Vermillion River Monitoring Network is conducted at VR807.

Figure B-44: Lower Mainstem Vermillion River Total Suspended Solids Monitoring: 2016-2024



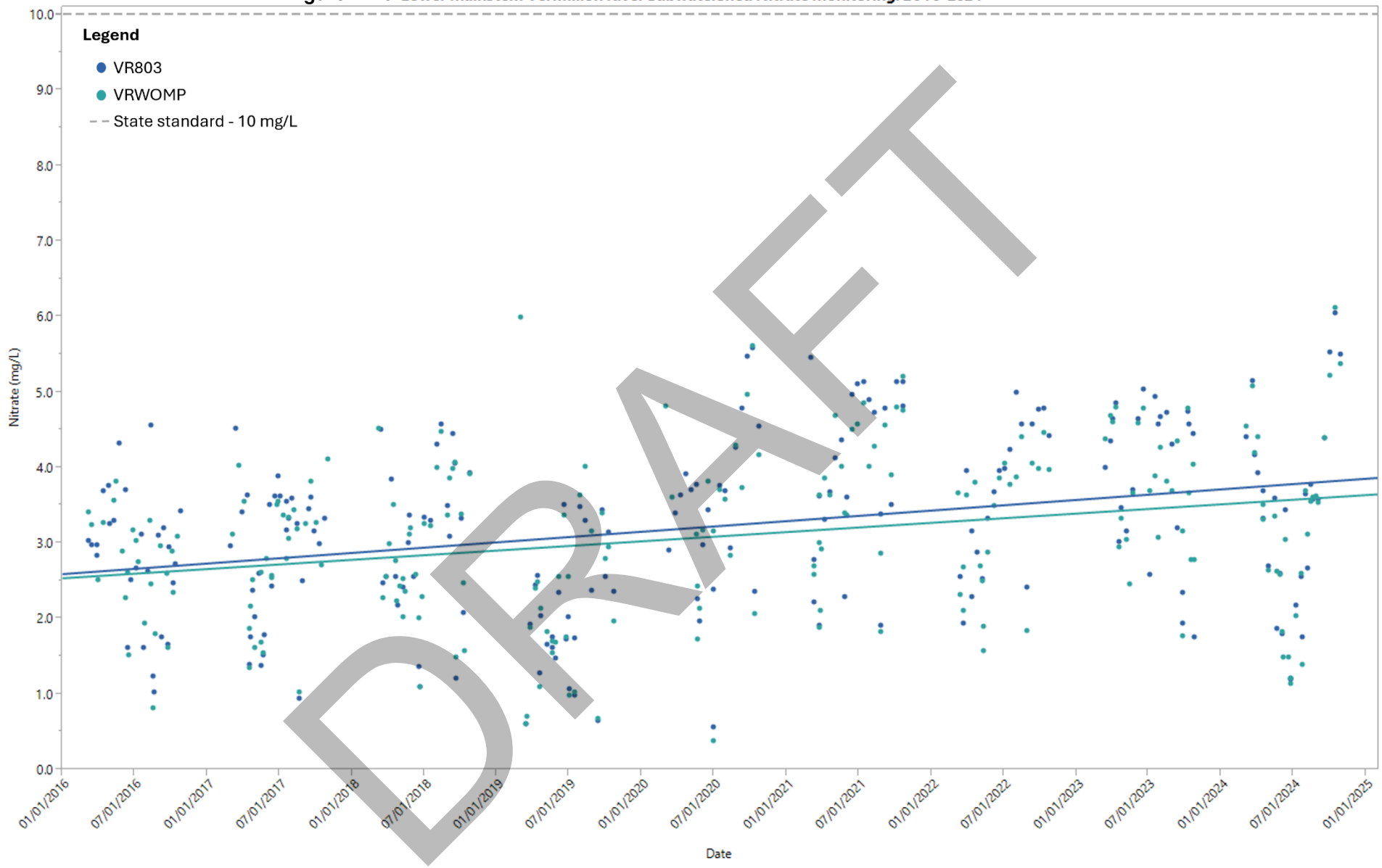
Lower mainstem monitoring for the Vermillion River Monitoring Network is conducted at VR803 and VRWOMP (Vermillion River Watershed Outlet Monitoring Program site in Vermillion Falls Park in Hastings).

Figure B-45: Lower Mainstem Vermillion River Subwatershed Total Phosphorus Monitoring: 2016-2024



Lower mainstem monitoring for the Vermillion River Monitoring Network is conducted at VR803 and VRWOMP (Vermillion River Watershed Outlet Monitoring Program site in Vermillion Falls Park in Hastings).

Figure B-46: Lower Mainstem Vermillion River Subwatershed Nitrate Monitoring: 2016-2024



Lower mainstem monitoring for the Vermillion River Monitoring Network is conducted at VR803 and VRWOMP (Vermillion River Watershed Outlet Monitoring Program site in Vermillion Falls Park in Hastings).

Figure B-47: VRMN Subwatershed TSS Pollutant Yields: 2016

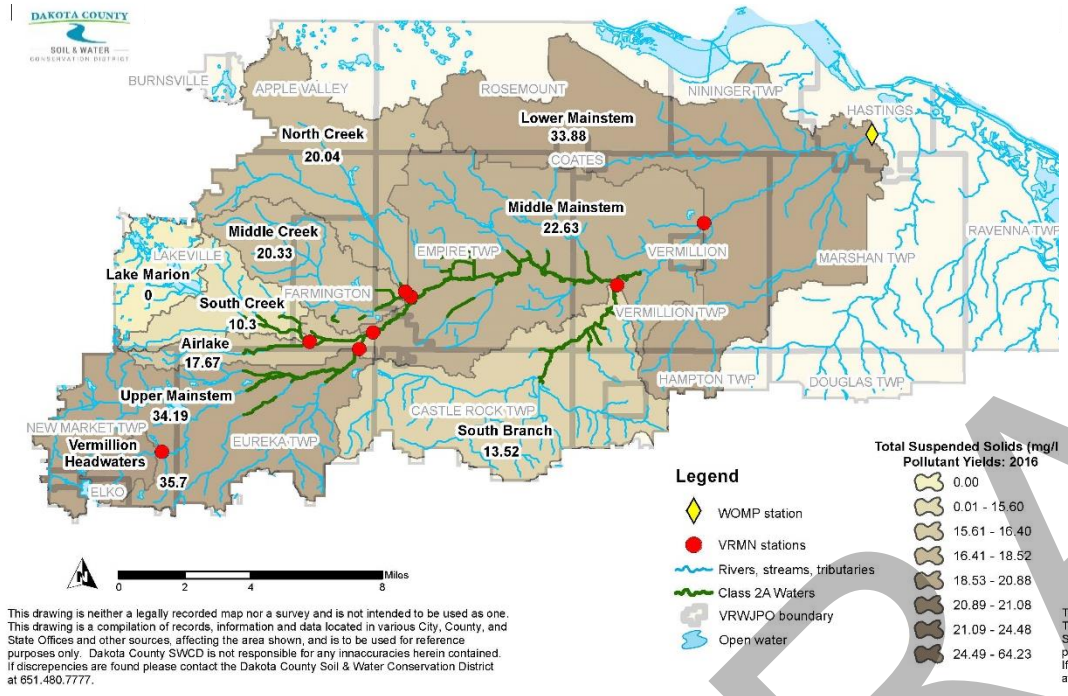


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Figure B-48: VRMN Subwatershed TSS Pollutant Yields: 2017

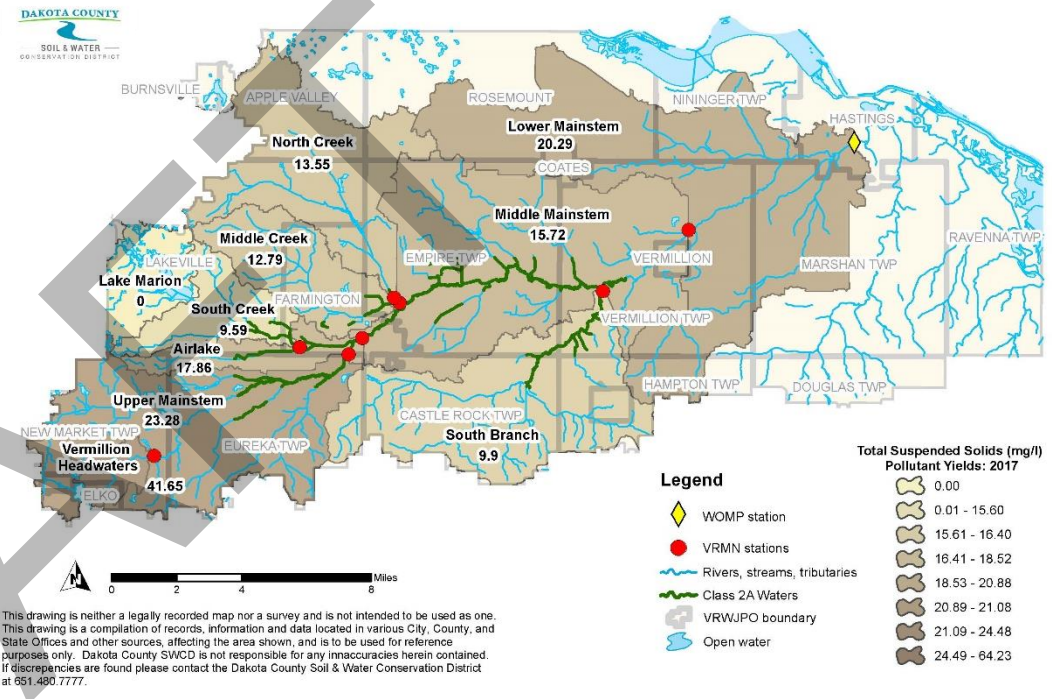

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Figure B-49: VRMN Subwatershed TSS Pollutant Yields: 2018

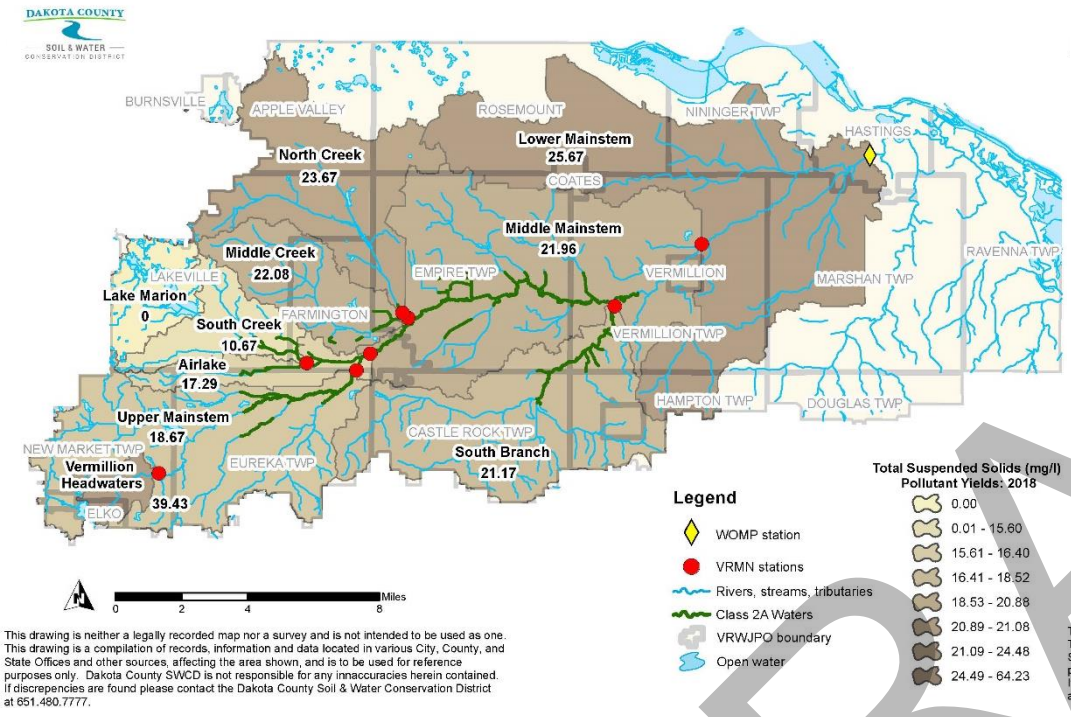

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Figure B-50: VRMN Subwatershed TSS Pollutant Yields: 2019

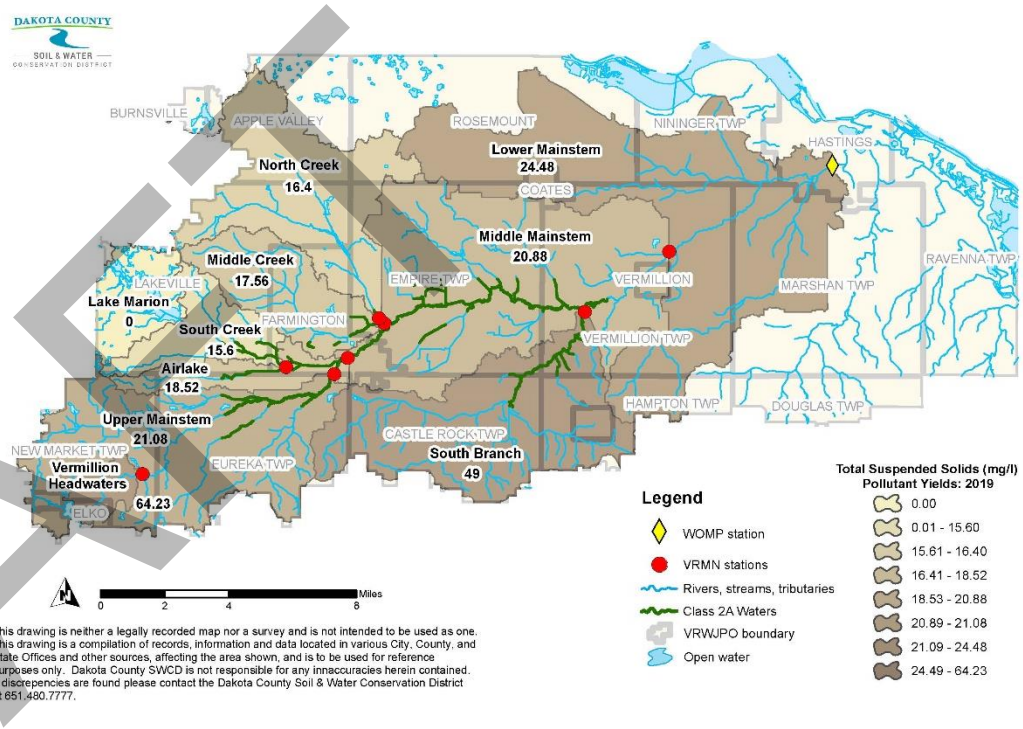

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Figure B-51: VRMN Subwatershed TSS Pollutant Yields: 2020

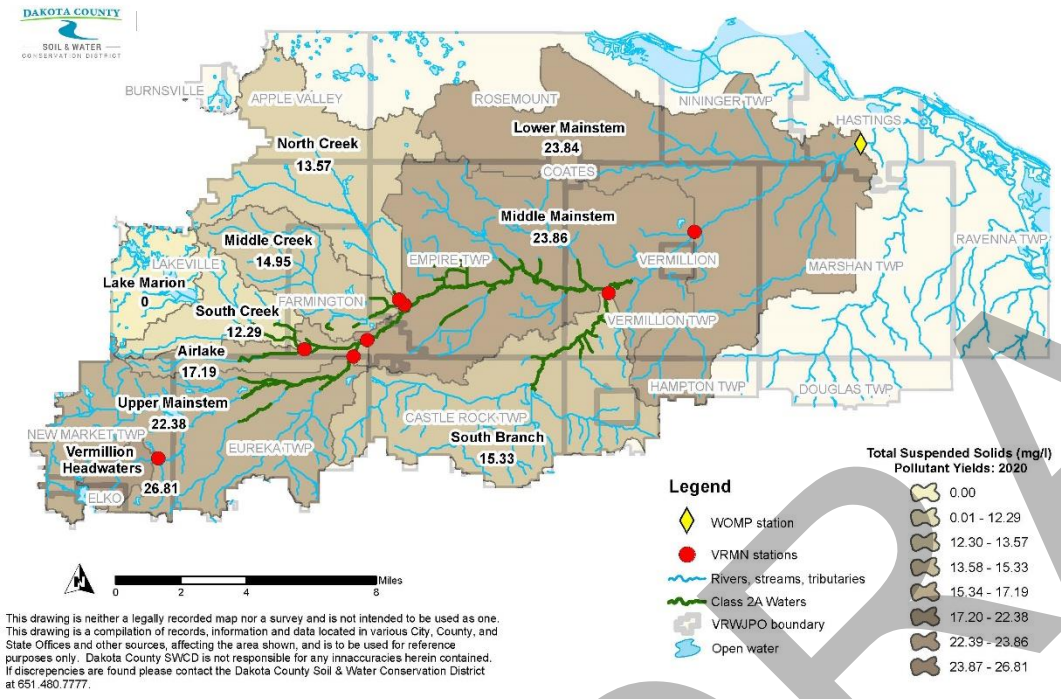

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Figure B-52: VRMN Subwatershed TSS Pollutant Yields: 2021

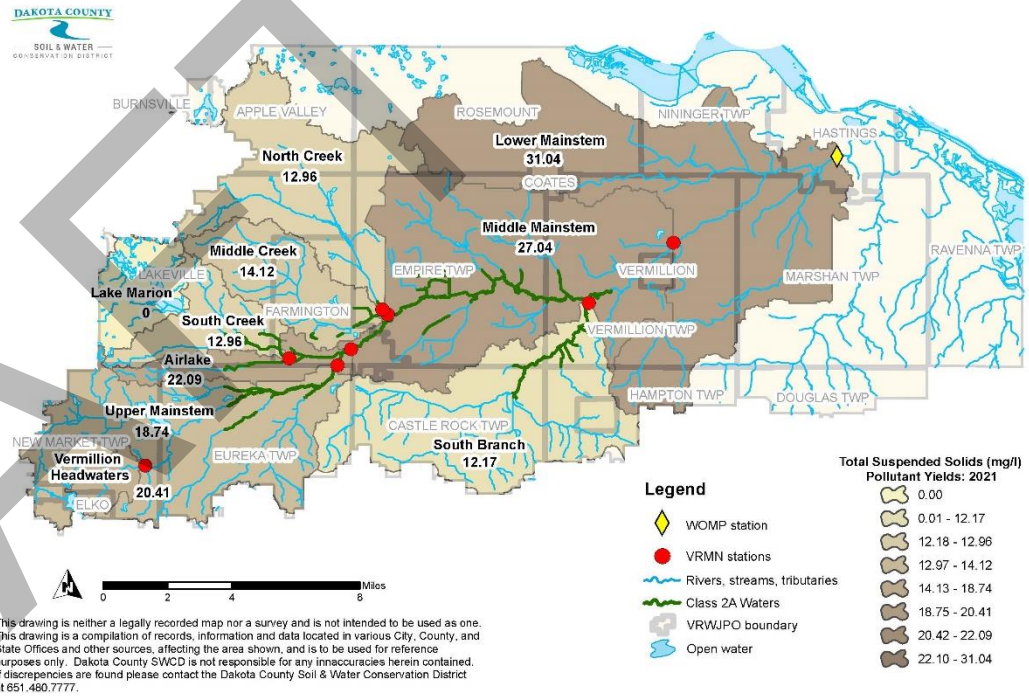

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Figure B-53: VRMN Subwatershed TSS Pollutant Yields: 2022

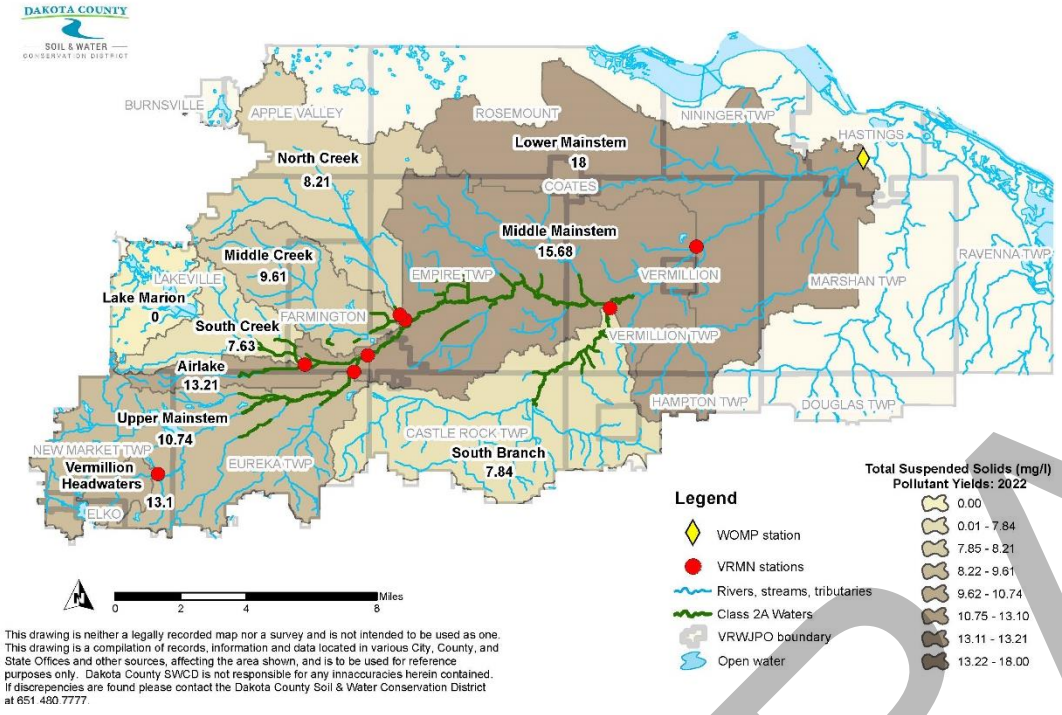

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Figure B-54: VRMN Subwatershed TSS Pollutant Yields: 2023

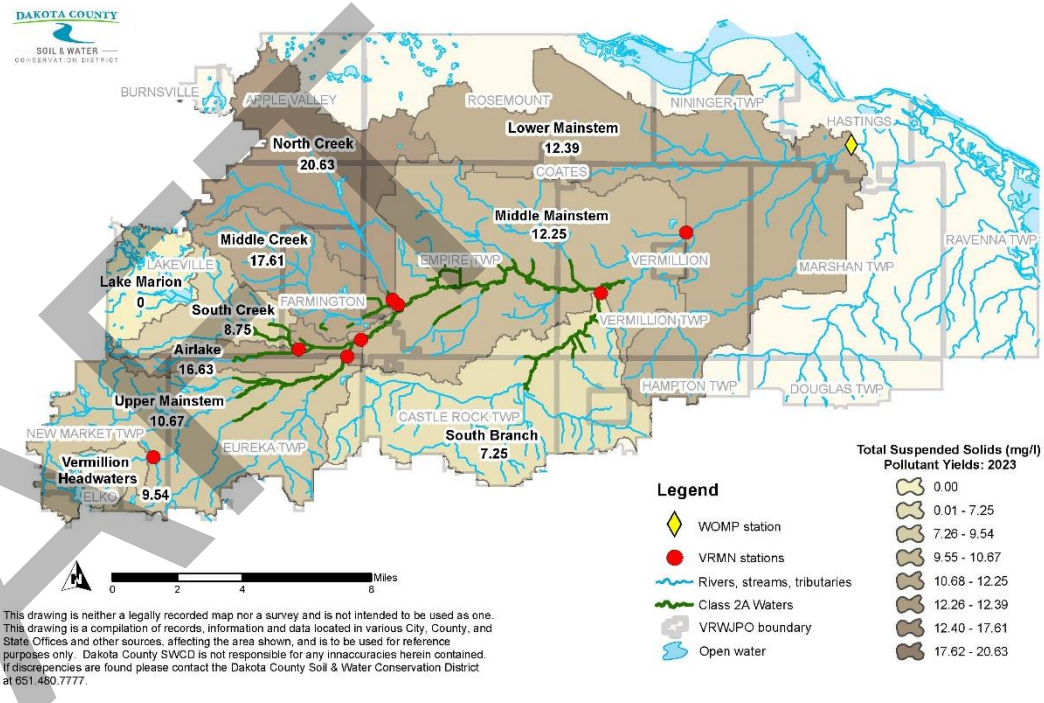

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Figure B-55: VRMN Subwatershed TSS Pollutant Yields: 2024

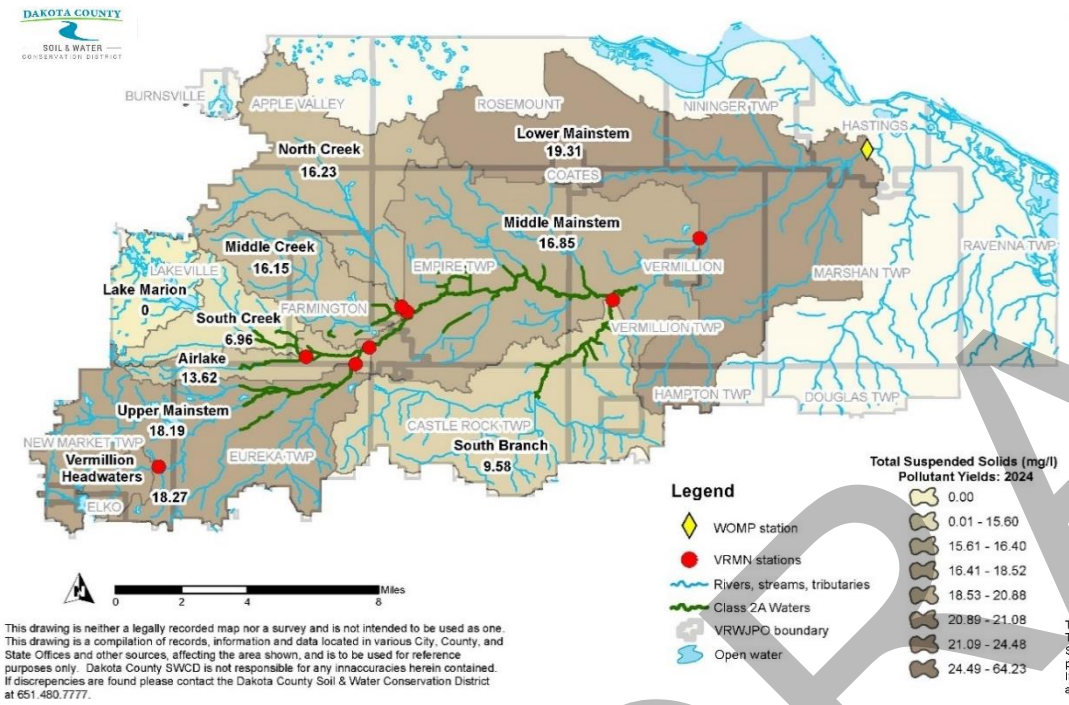

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Figure B-56: VRMN Subwatershed TP Pollutant Yields: 2016

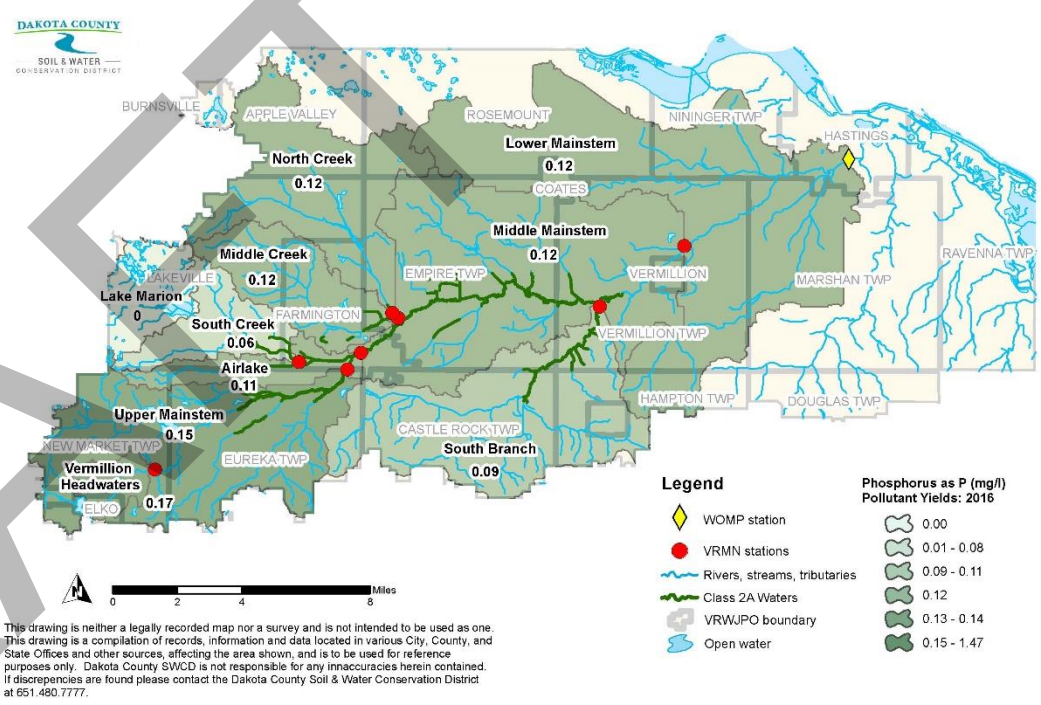

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Figure B-57: VRMN Subwatershed TP Pollutant Yields: 2017

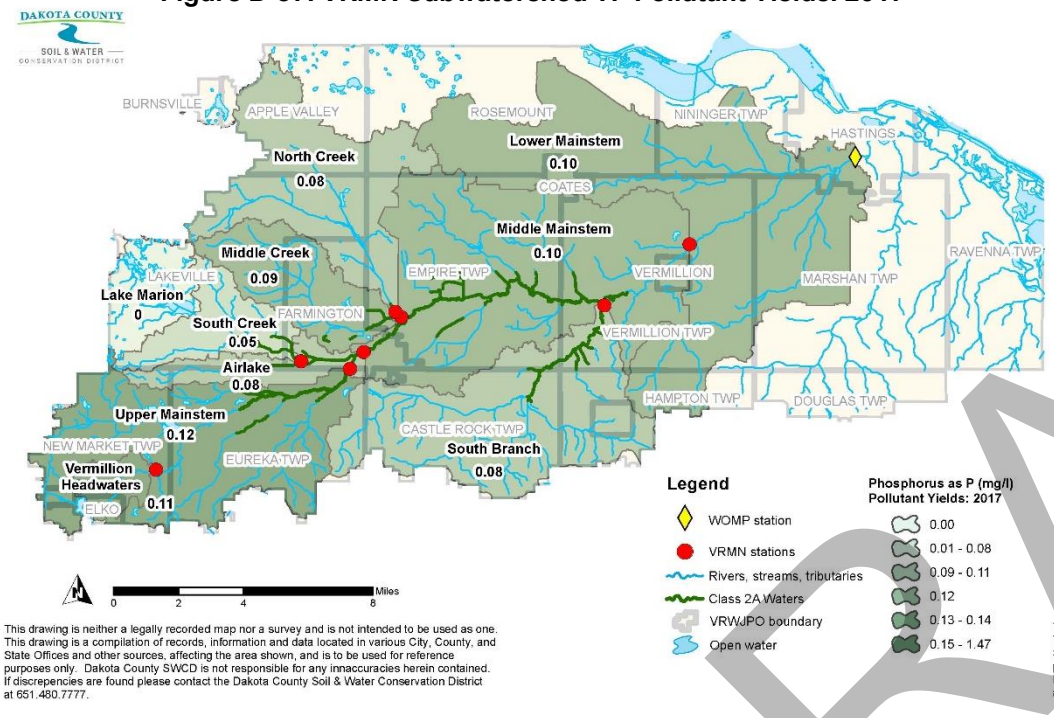

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Figure B-58: VRMN Subwatershed TP Pollutant Yields: 2018

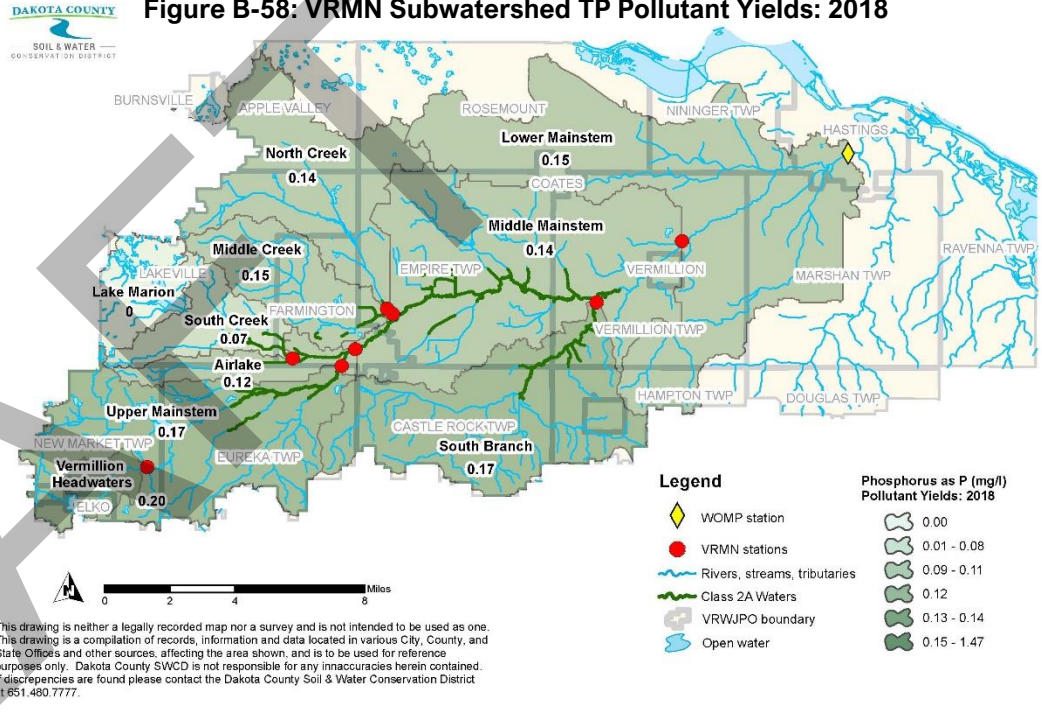

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Figure B-59: VRMN Subwatershed TP Pollutant Yields: 2019

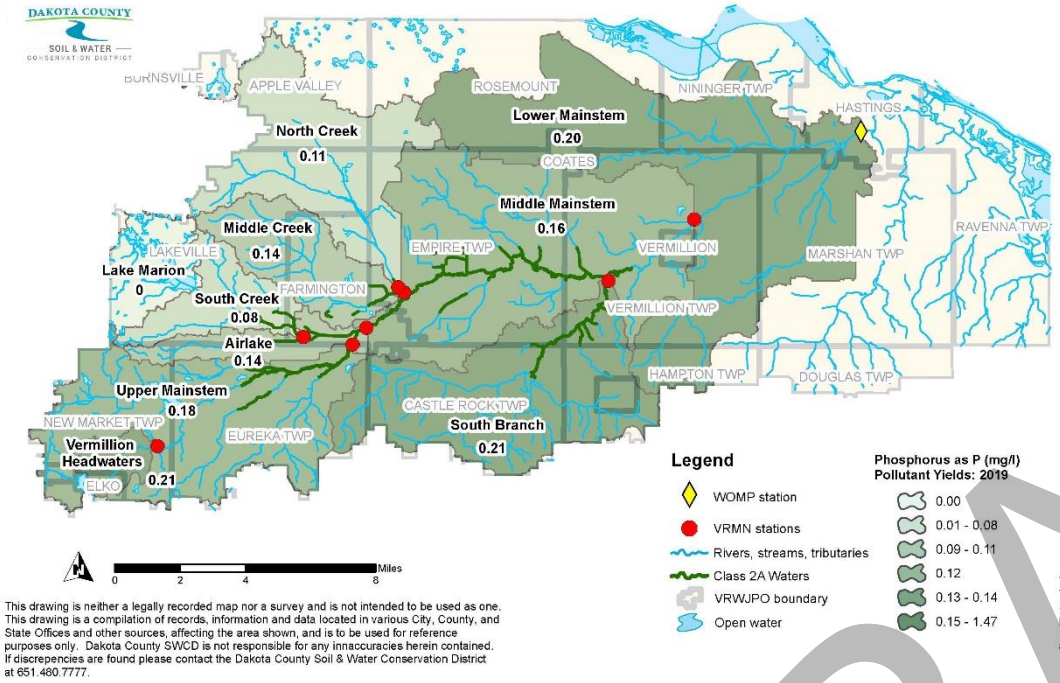

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Figure B-60: VRMN Subwatershed TP Pollutant Yields: 2020

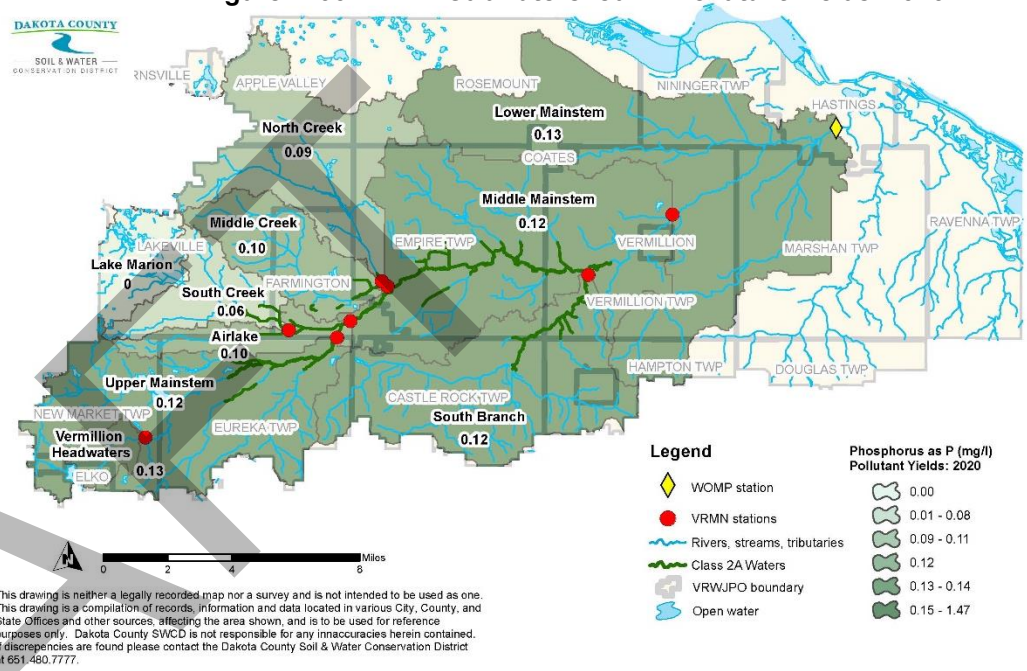

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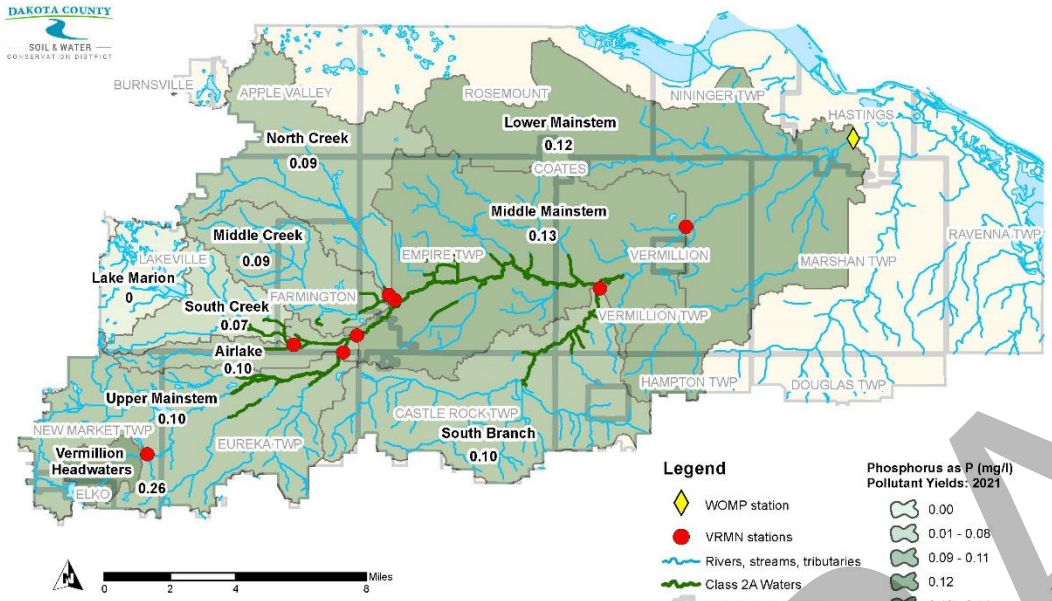
Figure B-61: VRMN Subwatershed TP Pollutant Yields: 2021



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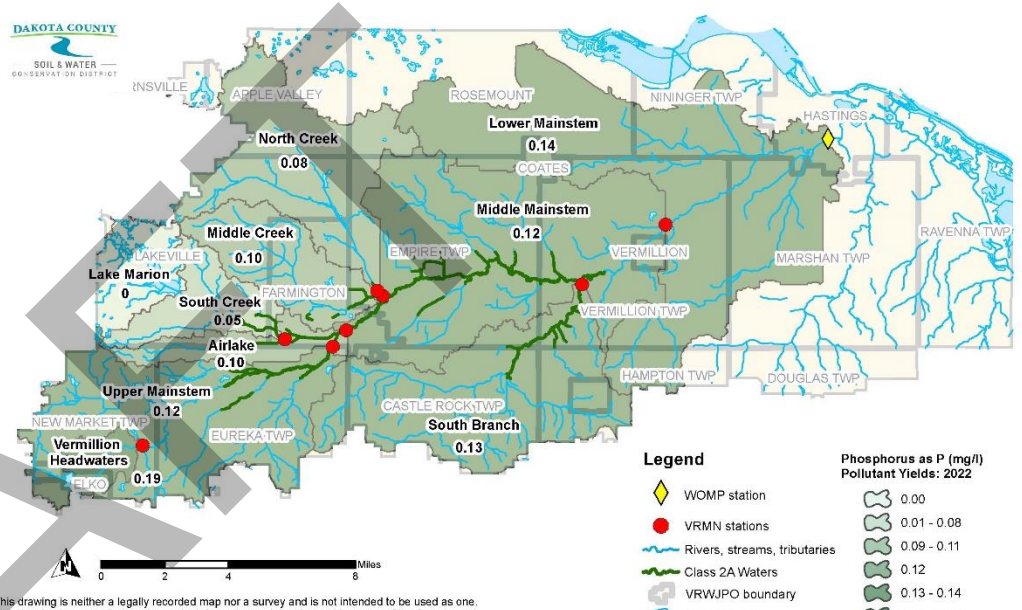
Legend

- WOMP station
- VRMN stations
- Rivers, streams, tributaries
- Class 2A Waters
- VRWJPO boundary
- Open water

Phosphorus as P (mg/l) Pollutant Yields: 2021

- 0.00
- 0.01 - 0.08
- 0.09 - 0.11
- 0.12
- 0.13 - 0.14
- 0.15 - 1.47

Figure B-62: VRMN Subwatershed TP Pollutant Yields: 2022



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Legend

- WOMP station
- VRMN stations
- Rivers, streams, tributaries
- Class 2A Waters
- VRWJPO boundary
- Open water

Phosphorus as P (mg/l) Pollutant Yields: 2022

- 0.00
- 0.01 - 0.08
- 0.09 - 0.11
- 0.12
- 0.13 - 0.14
- 0.15 - 1.47

Figure B-63: VRMN Subwatershed TP Pollutant Yields: 2023

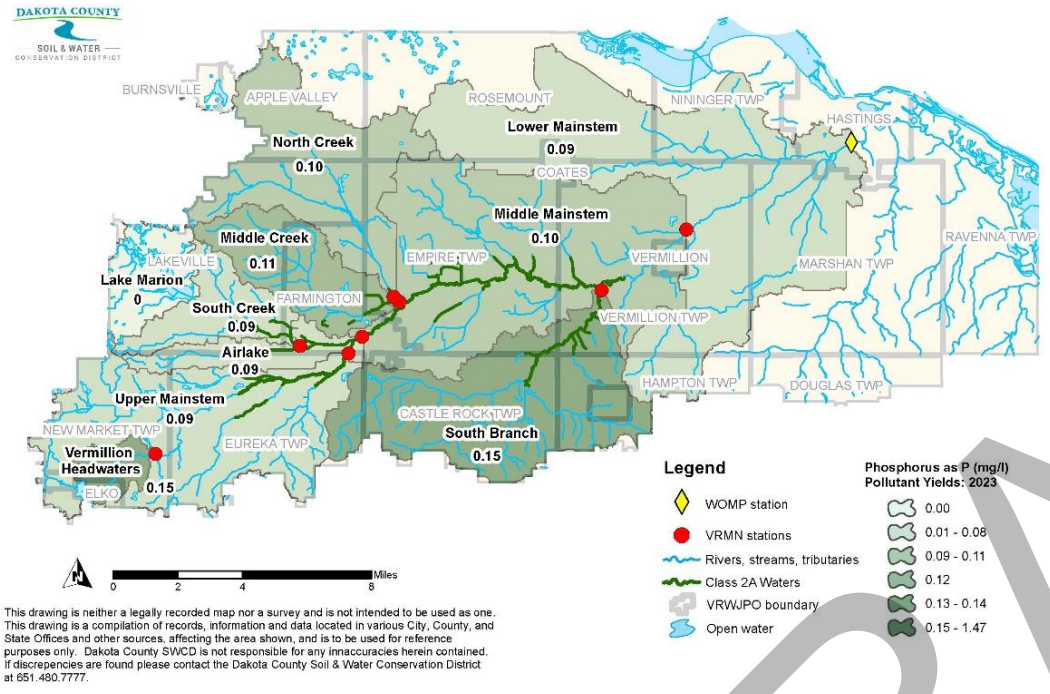

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Figure B-64: VRMN Subwatershed TP Pollutant Yields: 2024

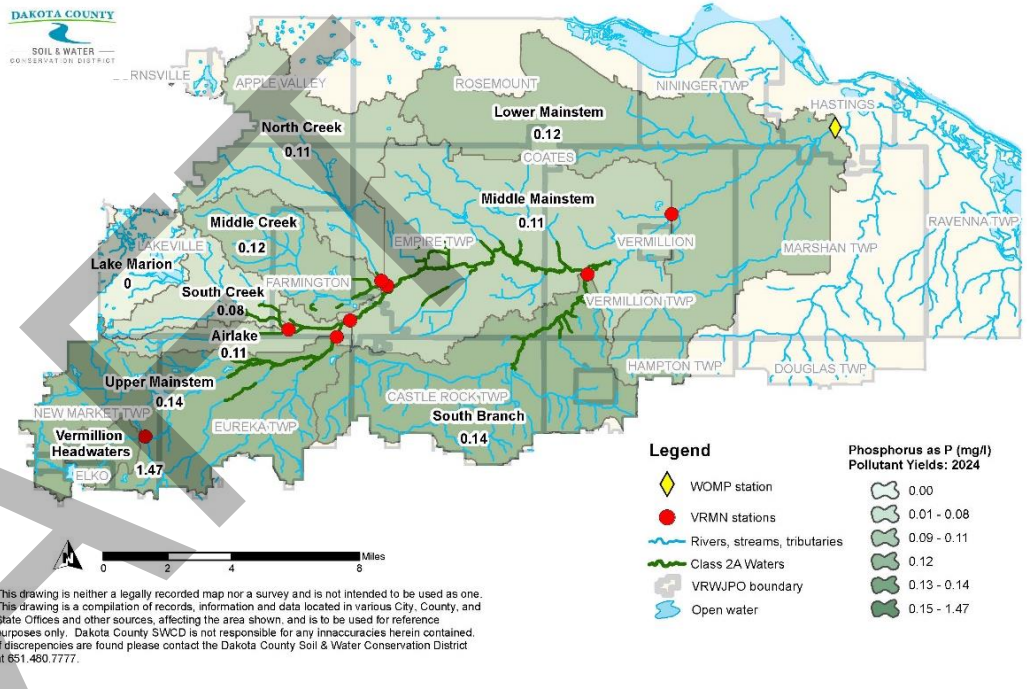

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Figure B-65: VRMN Subwatershed Nitrate Pollutant Yields: 2016

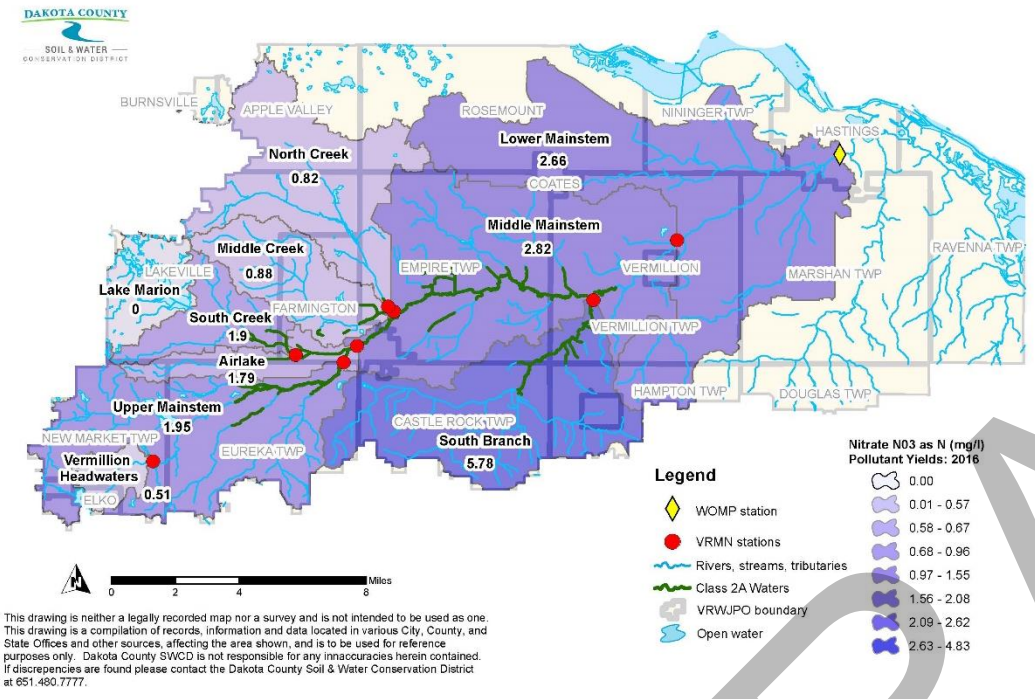

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Figure B-66: VRMN Subwatershed Nitrate Pollutant Yields: 2017

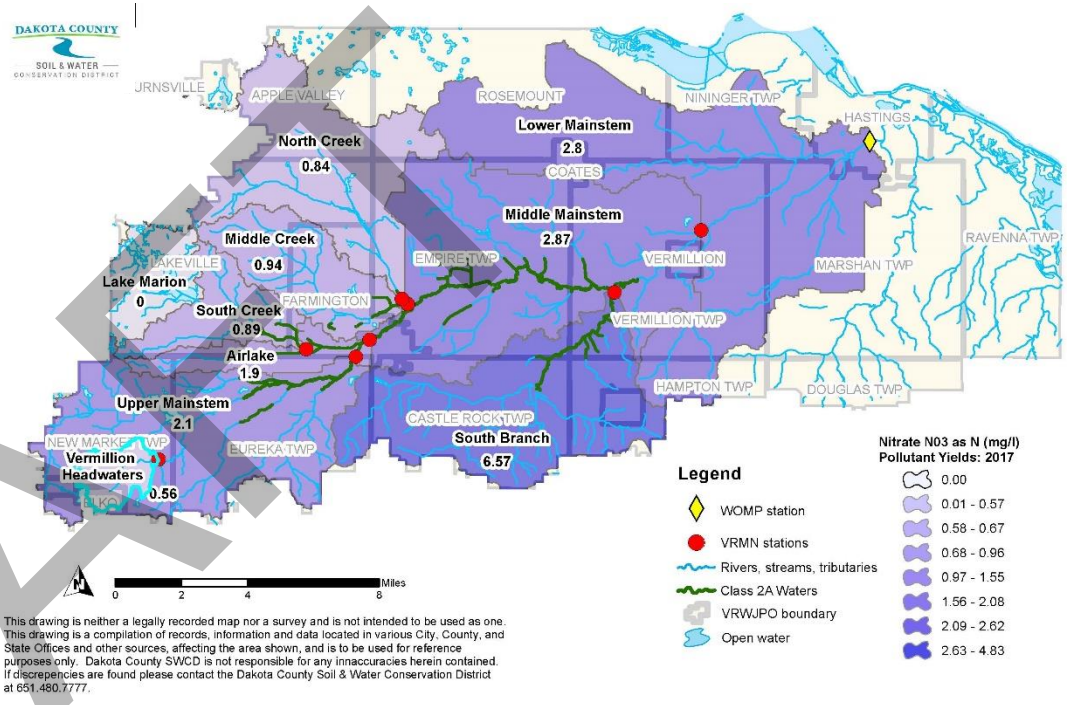

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Figure B-67: VRMN Subwatershed Nitrate Pollutant Yields: 2018

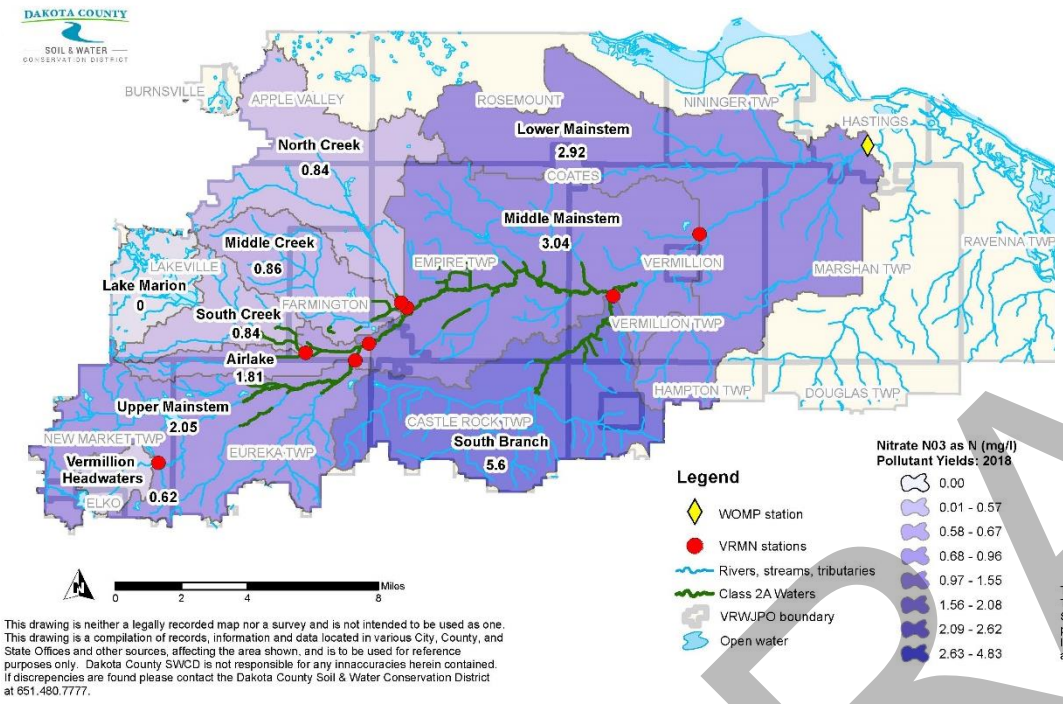

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Figure B-68: VRMN Subwatershed Nitrate Pollutant Yields: 2019

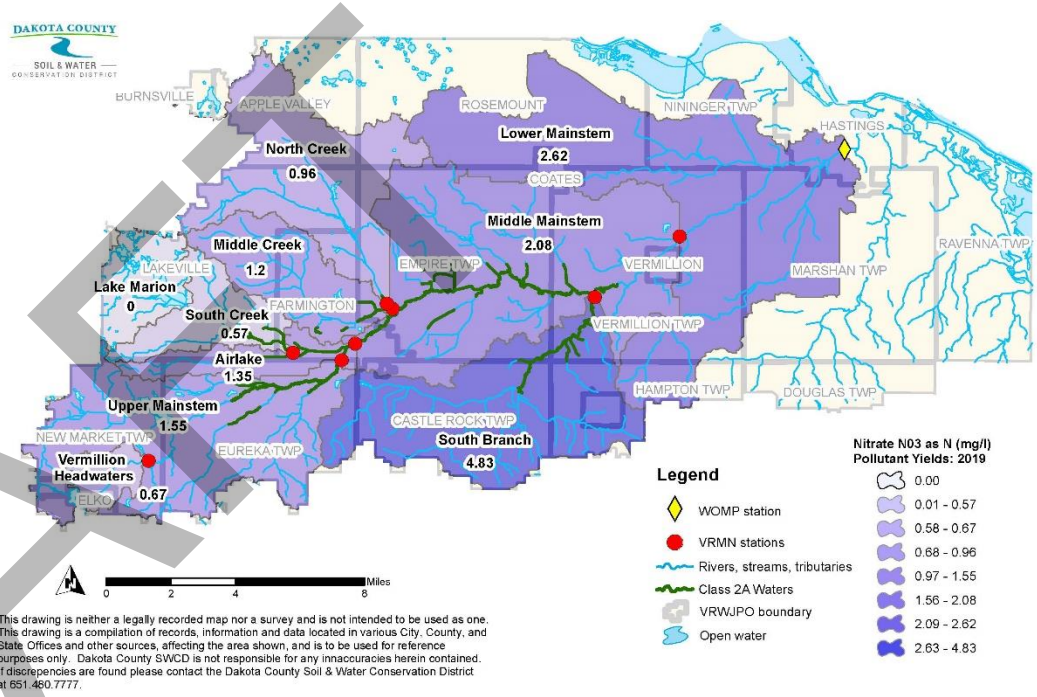

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Figure B-69: VRMN Subwatershed Nitrate Pollutant Yields: 2020

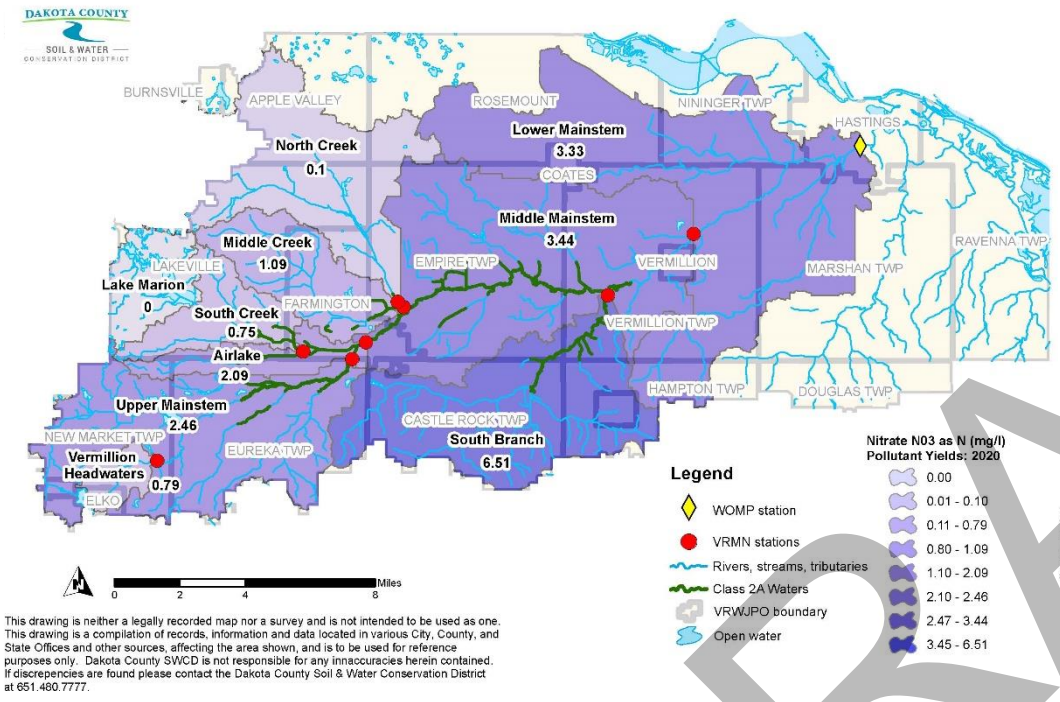

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Figure B-70: VRMN Subwatershed Nitrate Pollutant Yields: 2021

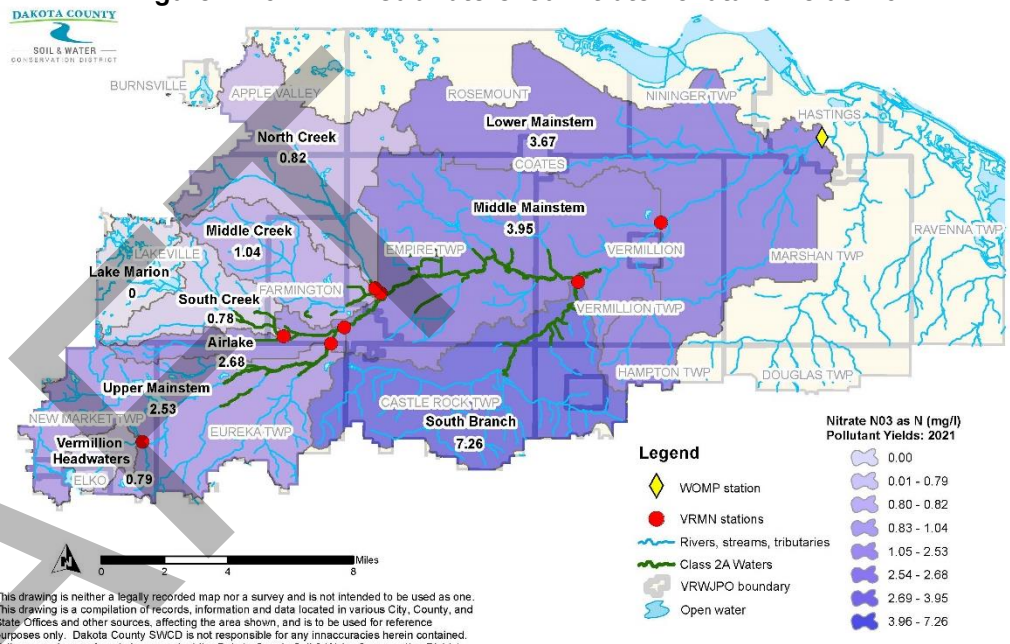

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Figure B-71: VRMN Subwatershed Nitrate Pollutant Yields: 2022

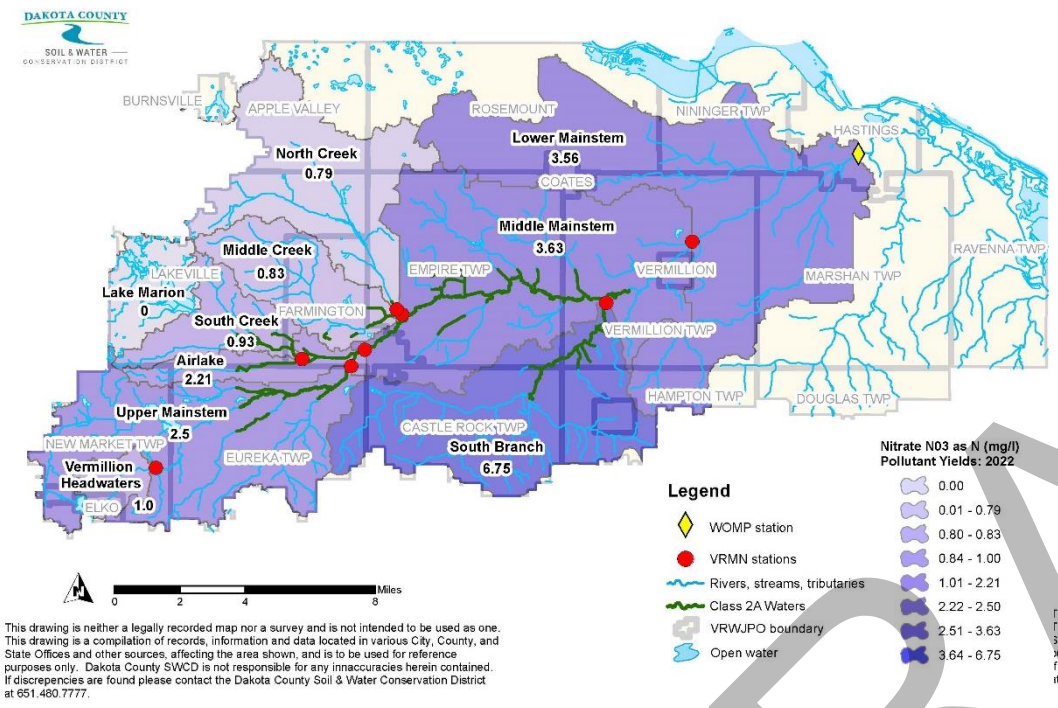


Figure B-72: VRMN Subwatershed Nitrate Pollutant Yields: 2023

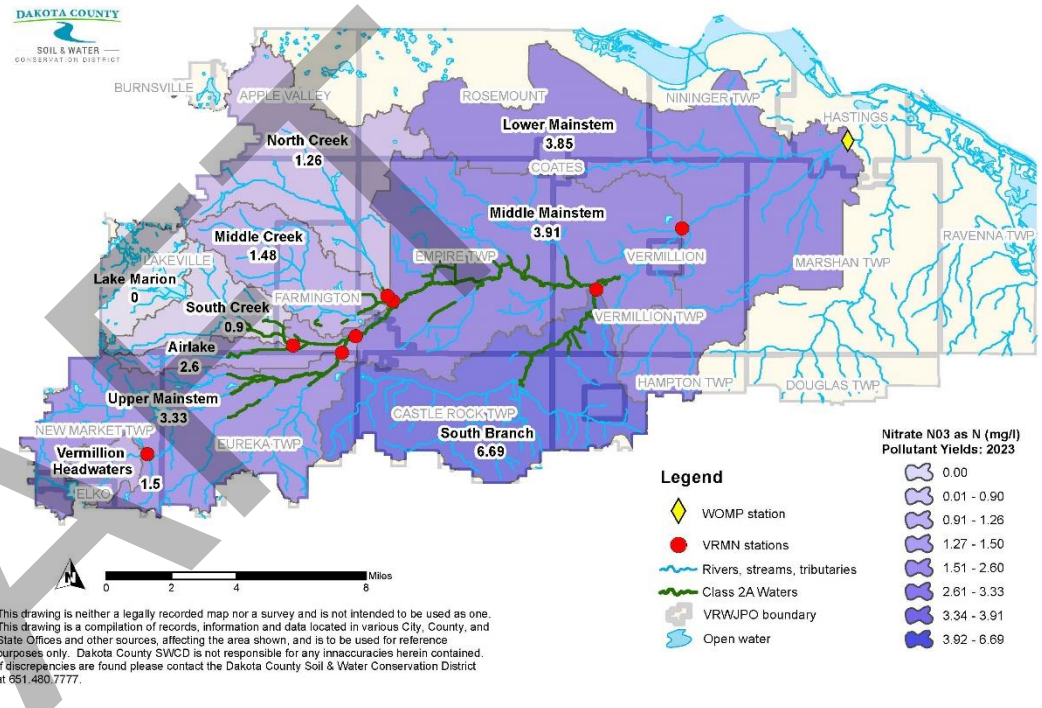
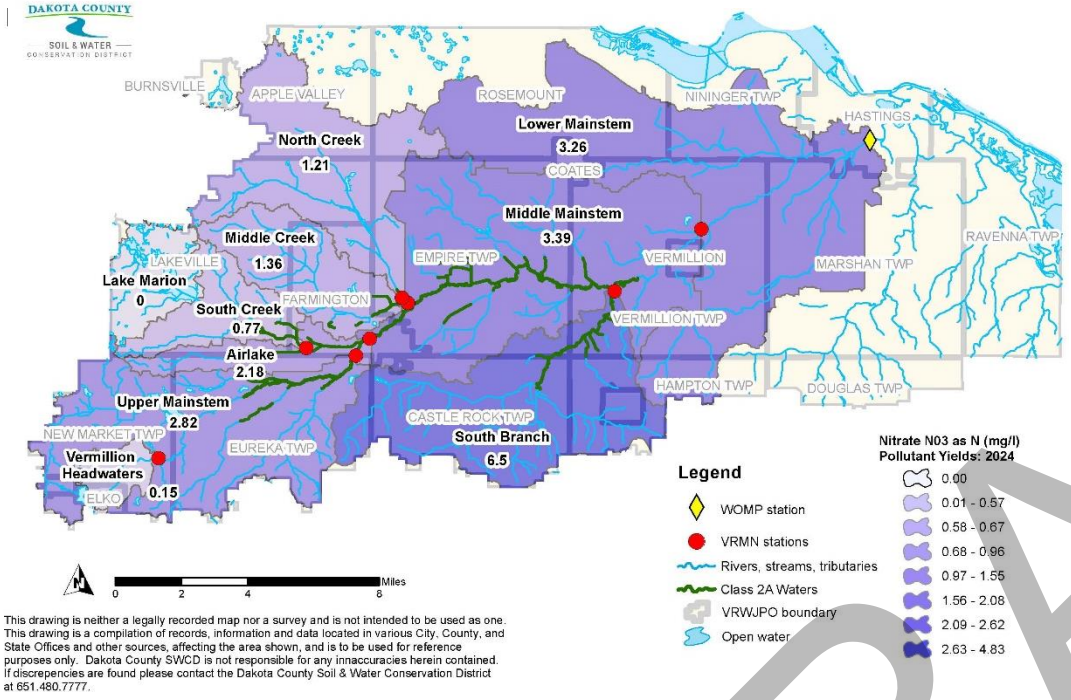


Figure B-73: VRMN Subwatershed Nitrate Pollutant Yields: 2024



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Narratives for monitoring trends before and after the adoption of the TSS standard can be found below. Summaries are high-level; for in-depth monitoring findings, visit the Vermillion River Watershed monitoring webpage.

2000 – 2013 Monitoring Protocols and Trends

In addition to logging of monitoring results, as a part of the VRMN data analyses, staff calculated pollutant loading via the FLUX stream load computation tool (2006-2011) and by calculating the Flow-Weighted Mean Concentration (2012-2013). A pollutant load is the total mass of a particular pollutant that flows through a monitoring station over a given period of time. Calculated loads were then divided by the area of the associated subwatershed to provide a pollutant load per acre, allowing staff to geographically target areas of higher loading.

From 2000 – 2013, monitoring stations generally met state turbidity standards during baseflow conditions; however, during runoff conditions, sample medians were often near or exceeding the standard. In 2008, the MPCA listed a stretch of the Vermillion River as impaired for turbidity, encompassing the VR807 and VR804 monitoring stations. To help track TMDL reduction attainment, two automated turbidity probes were added at these stations. During the monitoring period, the highest turbidity TSS pollutant loading was consistently sourced from the Upper Mainstem or South Creek subwatersheds, informed by turbidity probes as well as grab sampling throughout the watershed.

TP trends during this monitoring timeframe showed a decrease in concentrations during baseflow over time, likely due to upgrades made at the Elko New Market and Empire wastewater treatment plants (WWTPs). In addition, rerouting of WWTP effluent was diverted from the Vermillion River to discharge directly to the

Mississippi River, which resulted in lower baseflow TP concentrations. However, from 2006-2013 TP concentrations frequently exceeded standards during runoff events. TP pollutant loading analyses began in 2012. From 2012-2013, the highest TP pollutant loading was sourced from the Middle Creek Subwatershed.

Nitrate concentrations at all monitoring stations were all well within the state standard during baseflow. During runoff events, higher concentrations were measured, but remained within the standard; however, a unique relationship was present at the SB802 monitoring station. At the SB802, South Branch monitoring station, higher nitrate concentrations were seen during baseflow rather than during runoff. The subwatershed draining to the station is predominately agricultural land use, has course-textured soils and a high-water table. The high-water table in this subwatershed is often artificially lowered via tile and ditches to make agricultural production more viable.

In 2005, the VRWJPO was awarded an EPA Targeted Watershed Grant to monitor temperature in the Vermillion River and its tributaries. Monitoring began in 2005 and continued annually through 2013. Temperature can be influenced by many factors, including flow volume, conductivity, TSS concentration, groundwater impacts, and anthropogenic impacts. Likely due to significant development within the South Creek and North Creek subwatersheds, stations VR807, NC808 and NC801 saw worsening trends through this monitoring period.

The Vermillion River was officially listed as impaired for fecal coliform on the Federal Clean Water Act 303 (d) List of Impaired Waters in 1998. The MPCA completed a TMDL in the Lower Mississippi River Basin for fecal coliform, and later completed a Vermillion River specific study to focus on the impairment. The study, completed in 2004, identified the Middle Creek and North Creek subwatersheds as contributing unusually high concentrations.

Fecal coliform concentrations consistently exceeded the state standard at all monitoring sites, increasing in concentration following precipitation events. In 2008, the MPCA suggested discontinuing use of fecal coliform monitoring, instead switching to monitoring of E. coli for bacteria tracing. From 2006 – 2013, monitoring was focused on identifying the source of bacteria loading, which remained elusive.

2014-2023 Protocols and Monitoring

It is worthy of note, that during this monitoring time period, the VRWJPO experienced three consecutive years of drought, beginning in 2021. The 2021 drought was the most severe drought in Minnesota since 1988, leading to many watersheds entering into the “drought warning” designation and several entering into the “drought restrictive” designation, restricting certain water use activities to protect drinking water supplies. Drought continued in 2022 and 2023. Water quality parameters can be significantly impacted by drought, especially measures such as temperature.

During runoff events, TSS concentrations exceeded the state standard at all sites within the VRMN; however, during baseflow conditions, most sites were well within the standard. Unsurprisingly, TSS concentrations at the VR804 and VR807 sites during baseflow exceeded state standards, consistent with the impaired status along this reach of the Vermillion River.

From 2014-2023, TP levels remained generally below the state standard during baseflow, but occasionally exceeded the state

standard during runoff events. Runoff exceedances were seen more commonly during snowmelt monitoring in years with higher amounts of snowpack. No TP impairments exist within the VRMN.

Nitrate concentrations were well within the state standard for all sites within the monitoring period, during base flow and runoff sampling events. Consistent with the previous monitoring period, nitrate concentrations were seen as higher at the SB802 monitoring station.

All Class 2A stream monitoring stations within the VRMN consistently showed temperature maximums within the brown trout resistance range (range limit at which mortality can be observed) during all summer months. Highest temperatures were generally observed in July. However, median temperatures were observed as toggling between the optimum and tolerance range for brown trout, depending on seasonal fluctuations. August median temperatures were lower at SC806 and SB802 sites, which could be attributed to cool groundwater interactions.

E. coli concentrations exceeding the state standard were again observed at all sites during baseflow and runoff events throughout this monitoring timeframe. Consistently elevated levels continued to point to the potential continuous animal or septic source. In 2016, SCSWCD staff began further source monitoring focused on and around the VR24 monitoring station; this station showed exceedances markedly higher than other sites. Source monitoring involved: adding additional nearby monitoring sites within potential hotspot areas, eDNA sampling to determine if the source was from a human or cattle source; and continuing to inform other potential monitoring location based on findings. After collecting 8 years of source identification data, SCSWCD offered septic upgrade incentives in hopes of addressing some pollutant load that may be originating from failing septic systems. VRWJPO and partners continue to inform potential E. coli improvements based on collected data.

Biological Monitoring – Vermillion River Monitoring Network

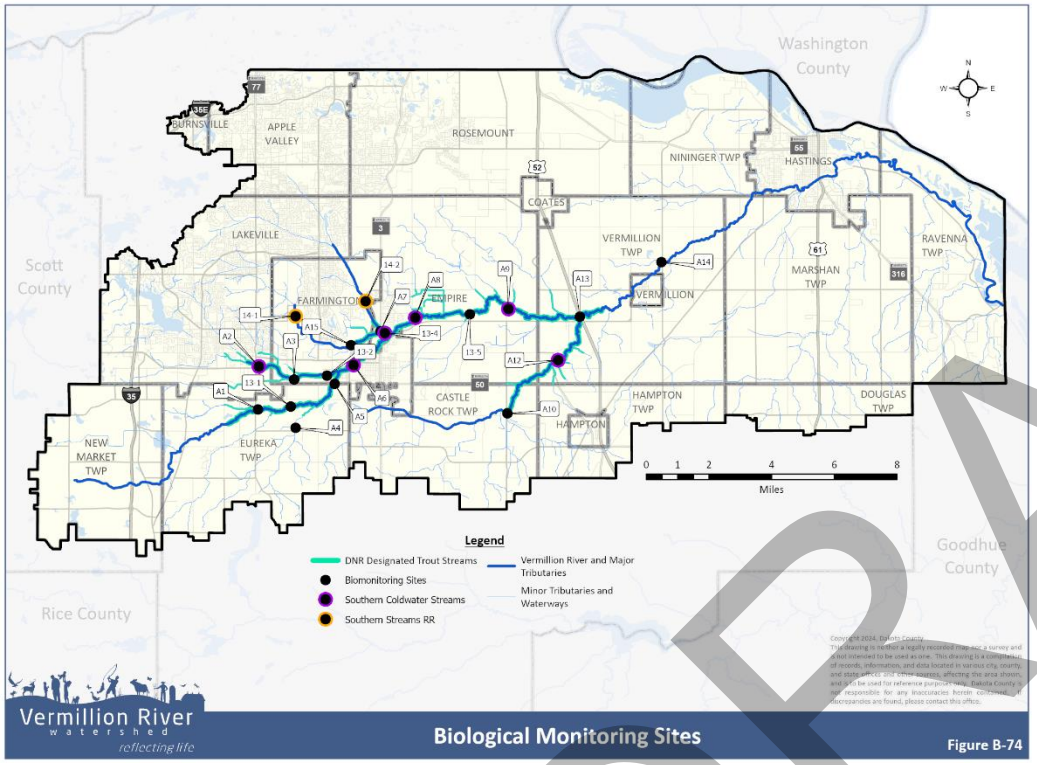
In 2008, the Vermillion River Biomonitoring Plan (VRBP) was created. The VRBP was created to define the scope and procedures to evaluate and track biological health in the VRW, with six goals:

1. Characterize the current biological conditions of the Vermillion River and its tributaries to evaluate attainment of the beneficial uses
2. Establish appropriate biological indicators for the coldwater, warmwater, main stem and tributaries of the Vermillion River
3. Delineate the coldwater and warm-water communities in the Vermillion River
4. Assess long-term biological changes and trends in the condition of the Vermillion River including response to urbanization and channel restoration
5. Provide a framework for determining the impact of policies and regulations on water quality and biotic health
6. Identify appropriate management and restoration objectives

Biological monitoring was then initiated in the Watershed in 2009. Monitoring included assessing the number and type of fish and aquatic macroinvertebrates in the water, as well as geomorphic and habitat assessments.

Aquatic macroinvertebrates are organisms that lack backbones (e.g. snails, mayflies, dragonflies, beetles) that live on river-bottom substrates (sediment, debris, logs or plants) for a part of their life

cycle. Populations and diversity of aquatic macroinvertebrates and fish species change in a predictable way with water quality. Some species are tolerant of poor water quality, while others can only survive in clean water.



By evaluating and quantifying particular attributes of species and number of collected fish and aquatic macroinvertebrates, a score called an Index of Biological Integrity (IBI) can be created. The IBI is a scientific way of determining if a biological community is impaired. The MPCA uses the VRWJPO's biological data to calculate IBI scores with the goal of using the IBI to:

- Measure the health of water creatures
- Diagnose the type of stressors damaging a water body
- Define management approaches to protect and restore the water's biological communities
- Evaluate the effectiveness of protection and restoration activities

Sampling took place annually during a consistent, seasonal time frame and was associated with recruitment cycles of organisms. The State of Minnesota defines the optimal time frame for aquatic macroinvertebrate sampling to be between August 1 – September 30. For fish, the State defines the optimal sampling period to be mid-June to mid-September.

The MPCA has established robust sampling methods for fish and aquatic macroinvertebrates, all of which were followed for the VRW biological monitoring. Generally, fish sampling included collecting fish, sorting by species, weighing and measuring all fish, and returning them to the stream. Aquatic macroinvertebrates were collected using a multihabitat method, collecting organisms from each of the stream's representative habitats in a stream reach. Samples are then subsampled to 300 organisms and identified to the genus level.

Biological monitoring sites are shown in *Figure B-74*. Fourteen sites were monitored from 2009-2024 in accordance with the VRBP. Aquatic macroinvertebrate and habitat assessments took place at all sites at which fish sampling was conducted. It should be noted that all fourteen sites were monitored from 2009-2015. In 2016, the dataset was analyzed to determine the appropriate sampling frequency for future biological monitoring efforts. Final recommendations of this analysis included the development of sentinel sites throughout the watershed which would be monitored

one time every two years, and the remaining sites would be monitored approximately once every three years.

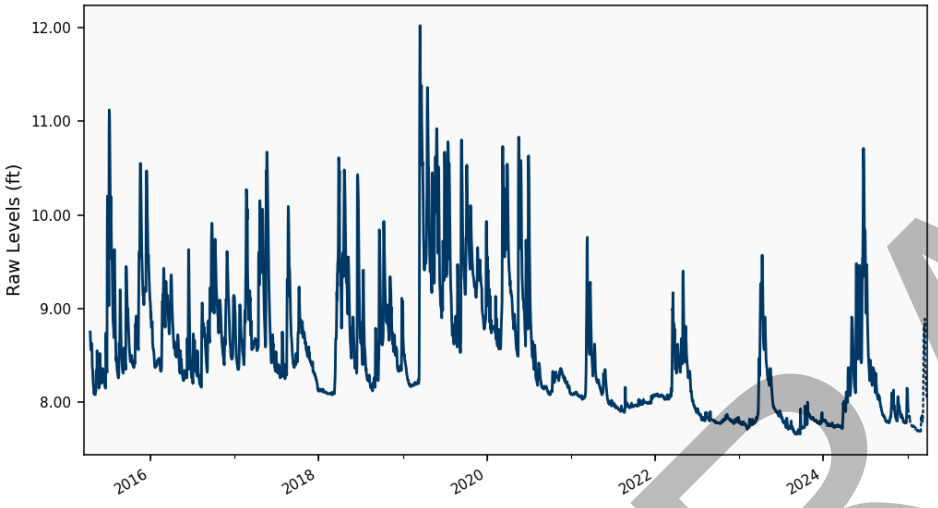
Findings of note throughout the monitoring period are listed below. To obtain a more comprehensive understanding of annual findings, visit the VRWJPO Monitoring webpage.

- As brown and rainbow trout are not native coldwater species, coldwater sites consistently receive low metric scores for metrics linked to native coldwater fish species. This fact leads to the questioning of the applicability of established IBI standards within VR coldwater reaches, as referenced elsewhere in the Plan.
- During the initial years of monitoring (2009-2011), while climatic patterns fluctuated (precipitation patterns and mean temperatures), aquatic macroinvertebrate results were consistent. While consistent, the macroinvertebrate IBI values failed to meet minimum thresholds for all sites, justifying the many proposed IBI impairments.
- From 2009-2013, there was high variability in fish IBI scores at the nine long term sites in the Southern Coldwater Stream (2A) category, with some years meeting and some exceeding above the impairment threshold; however, most years, the coldwater reaches were generally at or below the impairment threshold.
- From 2010-2016, the 14-1 site, one of two monitoring sites classified as within the "Southern Headwater Streams" MPCA IBI Category, received consistently high fish IBI scores.
- From 2010-2022, the second monitoring site classified as within the "Southern Headwater Streams" MPCA IBI Category (A-15), never once was below the general use threshold for fish IBI.
- From 2012-2020, aquatic macroinvertebrate and habitat assessment scores remained "fair," which is lower than desired. Recommendations for improvements to overall stream habitat (fish cover, channel sinuosity and channel substrate) were seen in monitoring reports throughout these years.
- In 2014, those streams classified as warmwater "Southern Streams" (MPCA IBI Category) set record highs for fish sampled; however, from 2015-2016, those same sites set record lows each year.
- In 2020, six of the ten coldwater monitoring sites received the highest observed fish IBI scores on record, with years of monitoring ranging from three to twelve years of data collection.
- In 2021, aquatic macroinvertebrate and habitat scores were found to be "good" or "fair" for most sites, showing signs of potential improvement when compared to previous years. The same year, four of the five monitored coldwater stream sites received fish IBI scores above the general use threshold, denoting one of the best yearly results for the fish monitoring program.
- In 2022-2023, most macroinvertebrate and habitat scores were "poor" or "fair." Lower water levels were seen throughout the Watershed, which likely contributed to lower-than-usual scores.
- In 2024, brook trout were captured for the first time at two coldwater sites, due to a recent stocking by DNR; however, the absence of native coldwater fish species will remain the limiting factor on fish IBI scores throughout the Watershed.

Water Quantity Monitoring – Vermillion River Monitoring Network

The VRWJPO works with the DNR to monitor stream water quantity monitoring to track potential impacts to the Vermillion River resultant of groundwater withdrawals via appropriations. In addition, partnerships with the USGS and Met Council allow for further quantification of stream flow trends.

Figure B-75: Vermillion River at Lakeville Stream Stage: 2015-2025



Trends from one DNR, one USGS and one Met Council stream flow monitoring stations are described below. These stations present flow trends within the Upper Mainstem, Middle Mainstem, and Lower Mainstem subwatersheds, illustrating stream flow trends through the mainstem Vermillion River.

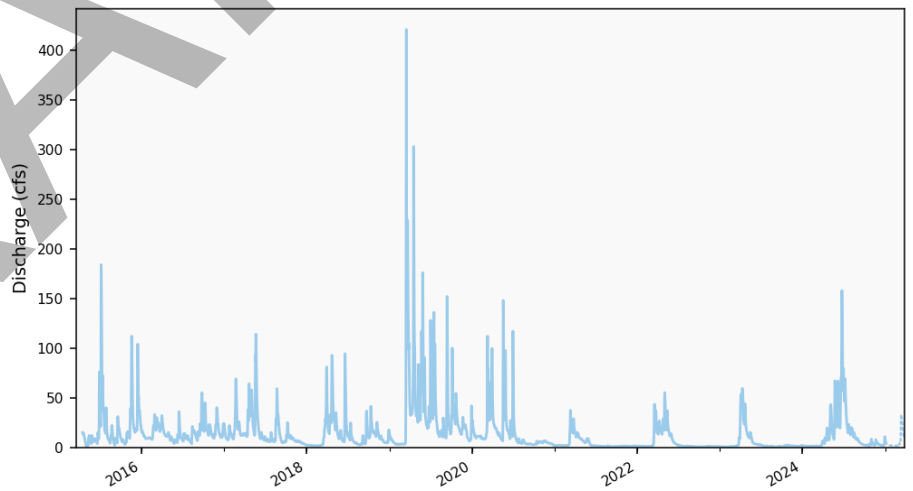
Vermillion River at Lakeville, CR23

The pressure sensor/datalogger associated with this monitoring station was installed on 04/15/15 for the purpose of stream gaging.

MN DNR staff collects stage data, takes flow measurements and compiles data for the VRJWPO and partners. The station drains 13,254 acres within the Upper Mainstem subwatershed. Data is collected at 15-minute intervals with data transmission to goes satellite at 1-hour intervals.

Over the 2015-2025 monitoring period, the river saw a gradual increase in stream stage from 2015-2020, with a fall in stream stage from 2021-2024. Three years of drought from 2021-2023 likely impacted stream levels during this monitoring period. A time series graph of stream stage created via the DNR's Cooperative Stream Gaging Program (which uses data from the datalogger associated with this site) can be seen in *Figure B-75*.

Figure B-76: Vermillion River at Lakeville Stream Discharge: 2015-2025

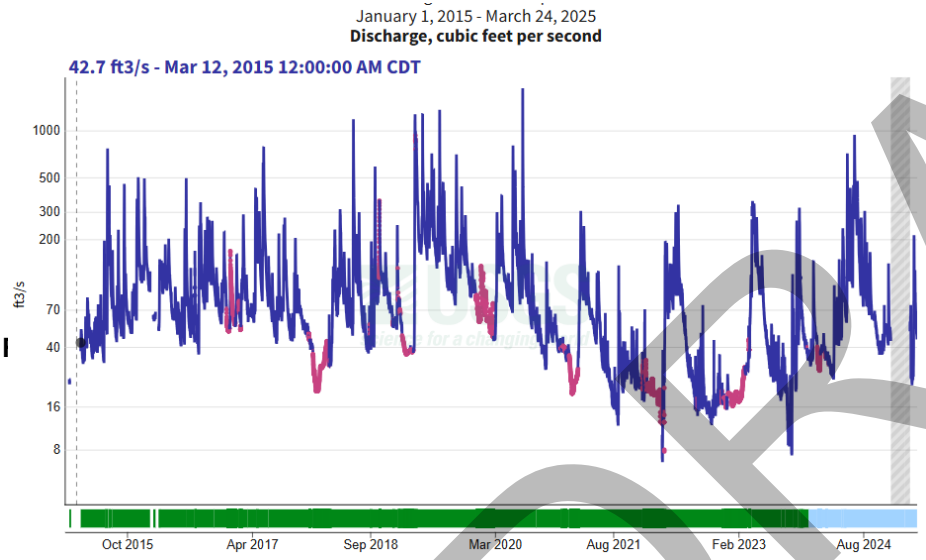


A time series graph of discharge occurring over the same time period can be seen in *Figure B-76*.

Vermillion River near Empire, 05345000

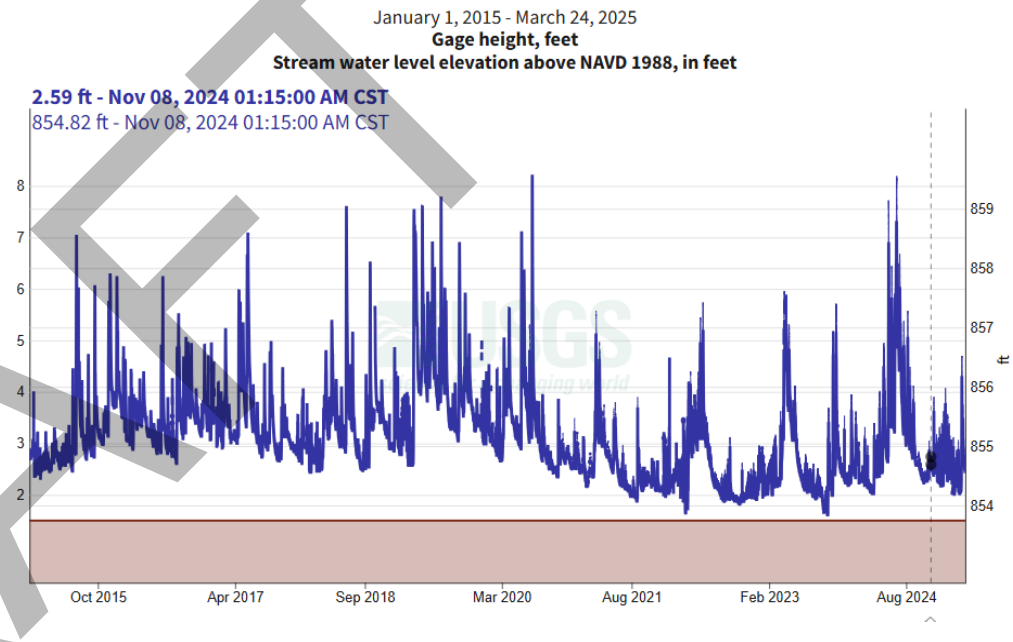
The VRWJPO provides cost-share for the operation of the USGS Blaine Ave gaging station located near Empire. The monitoring station has the longest continuous record of flow within the watershed, with some data types dating all the way back to 1942. The station drains 82,560 acres within the Middle Mainstem subwatershed. Data is logged at 15-minute intervals and logs stage and flow measurements.

Figure B-77: Vermillion River near Empire Discharge: 2015-2025



Over the 2015-2025 monitoring period, the river saw a similar trend to the Vermillion River at Lakeville monitoring station. Generally, the river increased gradually from 2015-2020, followed by a decrease in stage height from 2021-2023 in response to drought. A wet spring in 2024 brought the river to near normal stage. A time series graph of continuous data relating to river stage, obtained from the USGS' monitoring website, can be seen in *Figure B-77*. A time series graph of discharge occurring over the same period can be seen in Figure B-78.

Figure B-78: Vermillion River at Vermillion Falls Discharge: 2015-2025



USGS also calculates daily site statistics for discharge, communicating low, medium, high, mean and percentiles based on 53 years of data. These results (which vary depending on date of query) can be seen below.

Statistics for March 24, 2025 based on 53 years of data

Streamflow, ft³/s

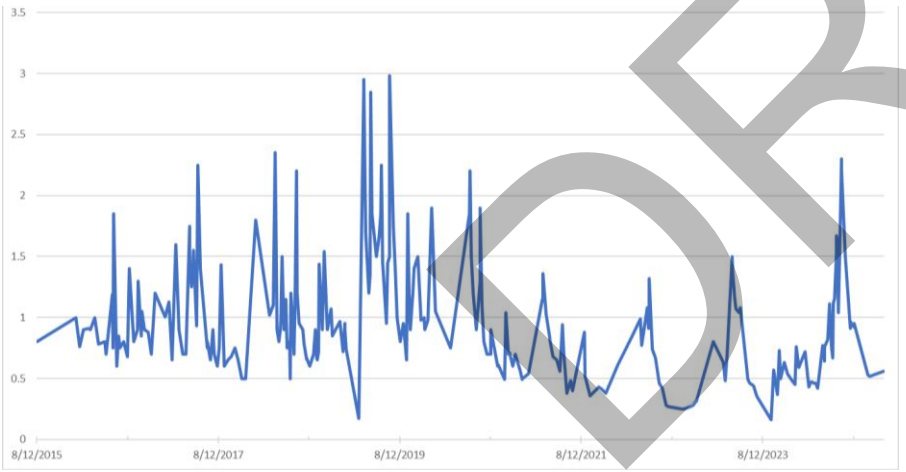
low (2013)	25th percentile	median	75th percentile	mean	high (2011)
23.6 ft3/s	58 ft3/s	84 ft3/s	120 ft3/s	118 ft3/s	643 ft3/s

Vermillion River at Vermillion Falls in Hastings

The Metropolitan Council oversees the Watershed Outlet Monitoring Program (WOMP), which consists of 20 long-term, automated stream and tributary monitoring stations across the metro. Through the program, stage, temperature, and specific conductance are routinely monitored. One such WOMP station is located at the Vermillion Falls within Hastings, which has logged data since 1995.

Over the 2015-2025 monitoring period, the river at the Vermillion Falls monitoring station followed a similar pattern to other stations, showing an increase in height from 2015-2020, and a decrease in height likely attributed to the 2021-2023 drought. One factor that could contribute to decreased stage height, unique to this location, is the nature of the Vermillion River being classified as a losing stream between the City of Vermillion and this location. This is described in more detail in Section B-10.

Figure B-79: Vermillion River at Vermillion Falls Stage Height: 2015-2025



Lake Water Quality Monitoring

The VRWJPO does not oversee lake water quality monitoring within the VRW; however, extensive data has been collected on Watershed lakes as a part of the Metropolitan Council CAMP. The CAMP, which is sponsored by partnering municipalities, empowers citizen scientists and governmental organizations to collect bi-weekly lake water quality samples to be analyzed in Met Council's Environmental Services lab, that are then paired with temperature and clarity data to be used for annual lake assessments. The following lakes are monitored as a part of the CAMP: Alimagnet Lake, East Lake, Farquar Lake, Lake Marion, Lake Rebecca, Long Lake and Valley Lake.

Overall monitoring trends can be found in the graphics on the following pages, logged according to lake. Long-term monitoring reports and annual assessments can be found on the Met Council's Lake and Monitoring Assessment page.

By tracking lake monitoring trends over time, staff can deduce trends relating to water quality decline, stability or improvement. In 2024, the VRWJPO Annual Report to BWSR included the following graphic, describing the aforementioned trends.

Table B-6: CAMP Lake Water Quality Trends

Lake	TP Trends	Secchi Transparency Trends
Alimagnet (2007-2024)	Improving	Improving
East (2007-2024)	Improving	Improving
Farquar (2007-2024)	Improving	Improving
Long (2007-2024)	Improving	Improving
Marion (2007-2024)	Improving	Improving
Rebecca (2015-2024)	Improving	Worsening

Figure B-80: Alimagnet Lake Secchi Transparency

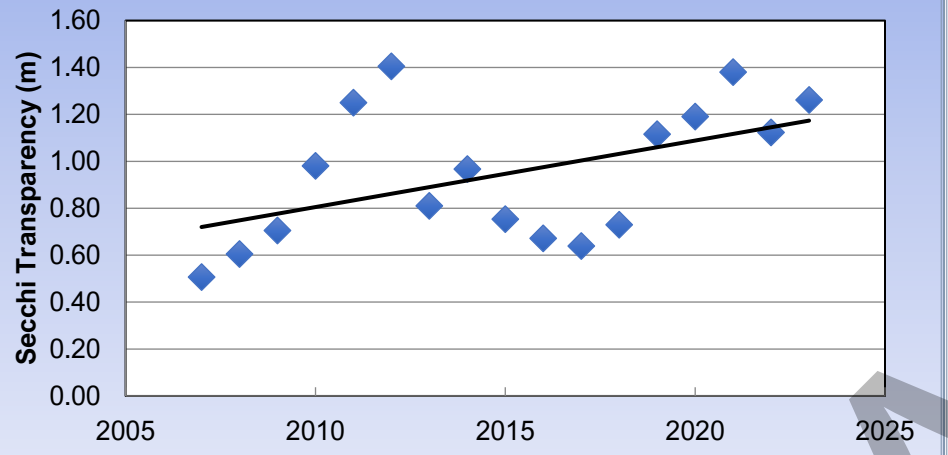


Figure B-81: Alimagnet Lake Total Phosphorus

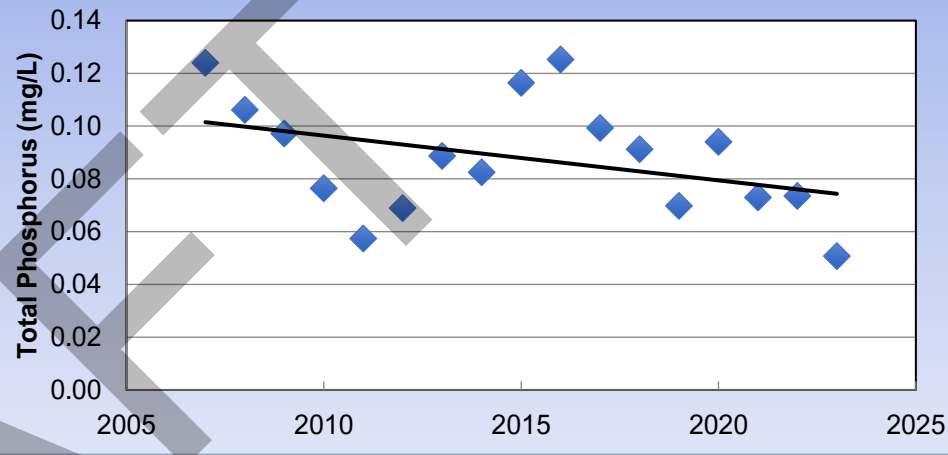


Figure B-82: East Lake Secchi Transparency

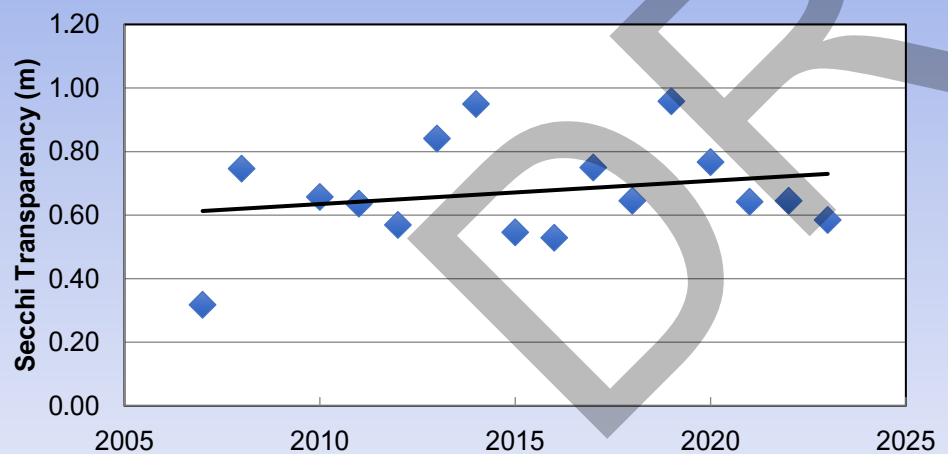


Figure B-83: East Lake Total Phosphorus

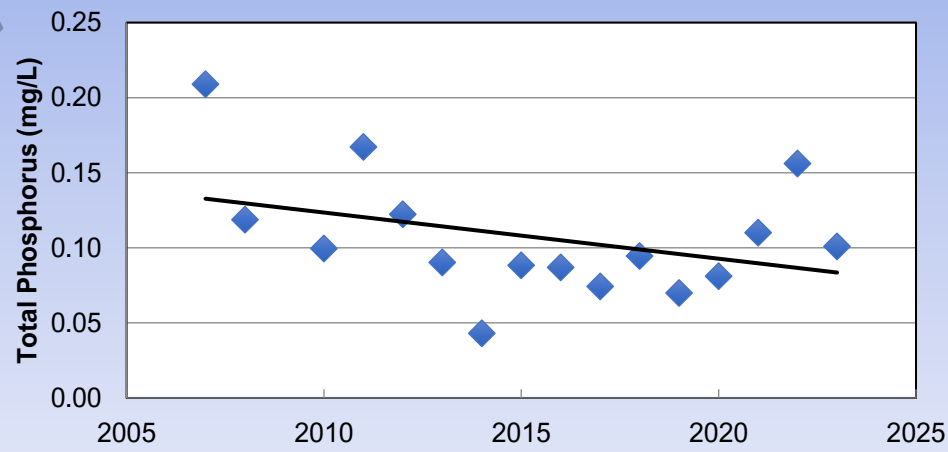
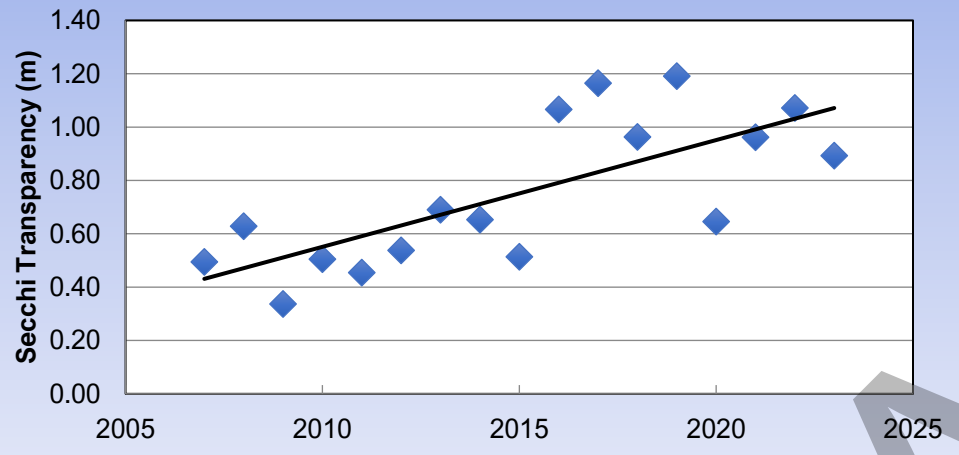
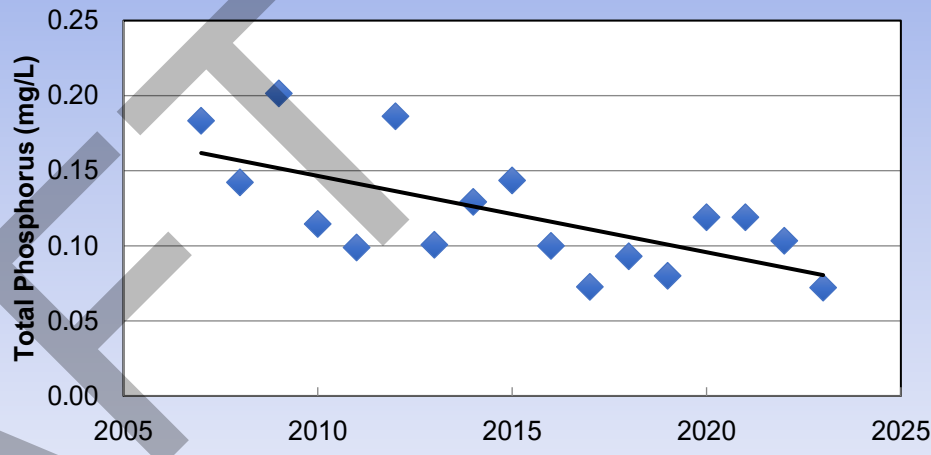


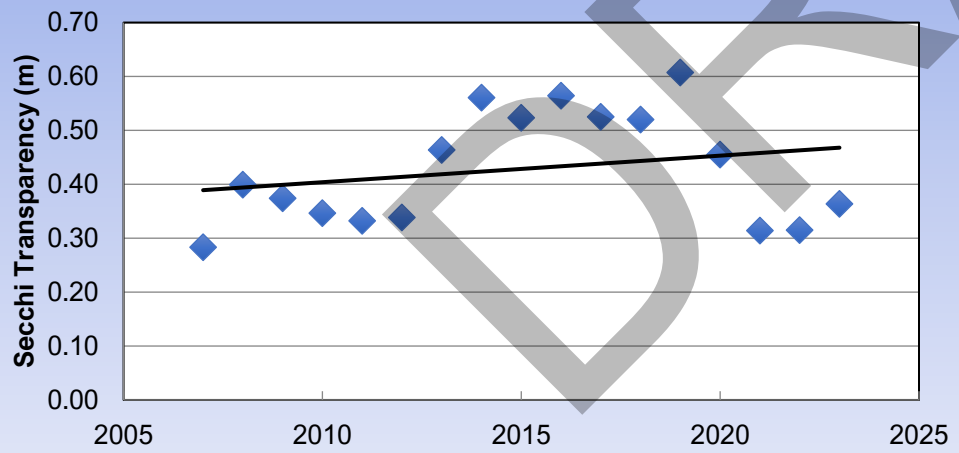
Figure B-84: Farquar Lake Secchi Transparency



B-85: Farquar Lake Total Phosphorus



B-86: Long Lake Secchi Transparency



B-87: Long Lake Total Phosphorus

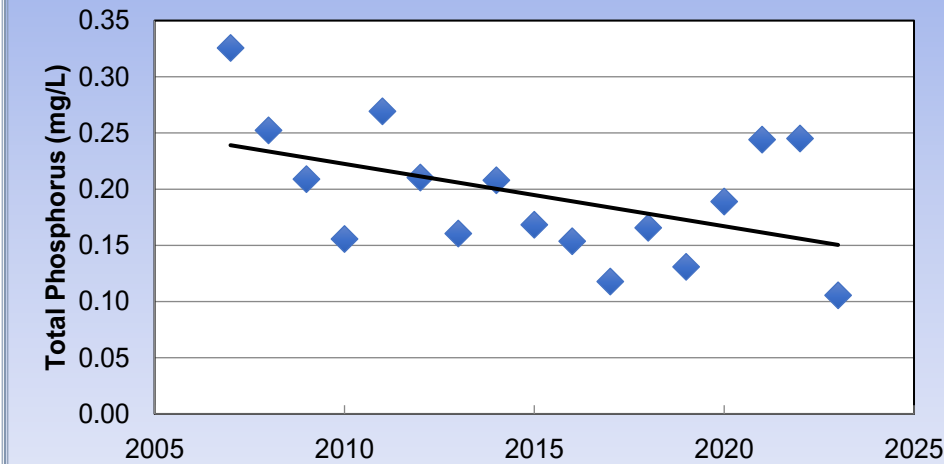


Figure B-88: Lake Marion Secchi Transparency

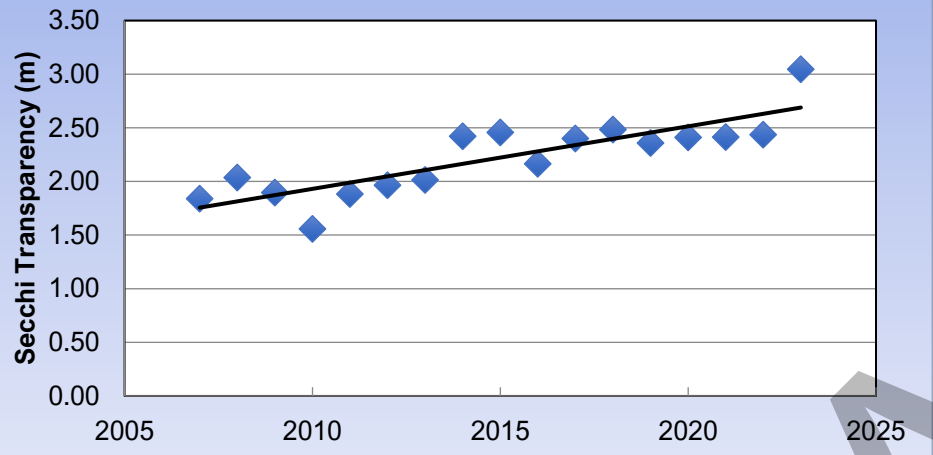


Figure B-89: Lake Marion Total Phosphorus

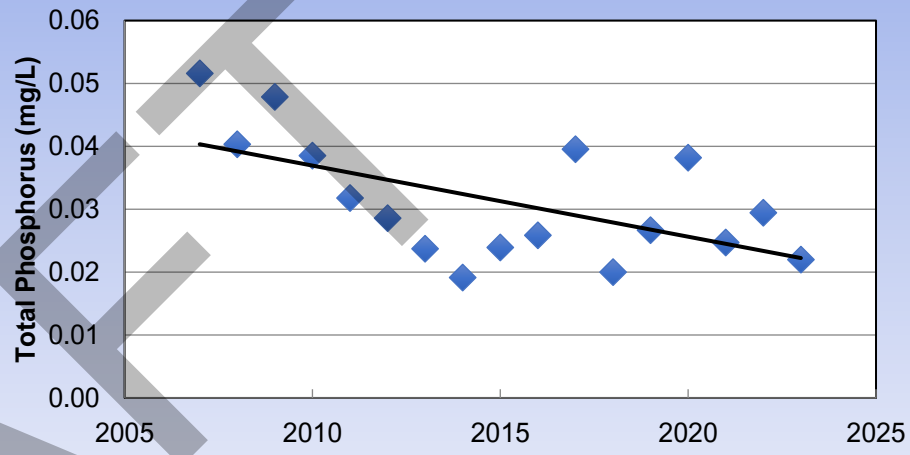


Figure B-90: Lake Rebecca Secchi Transparency

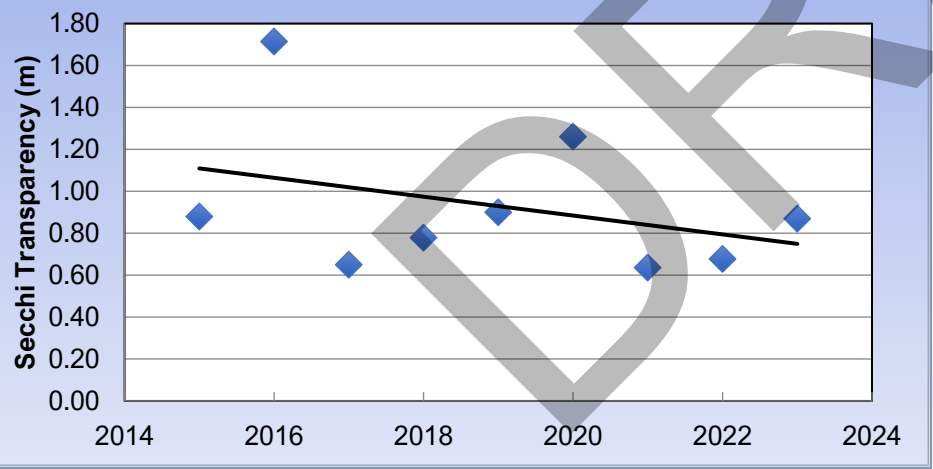
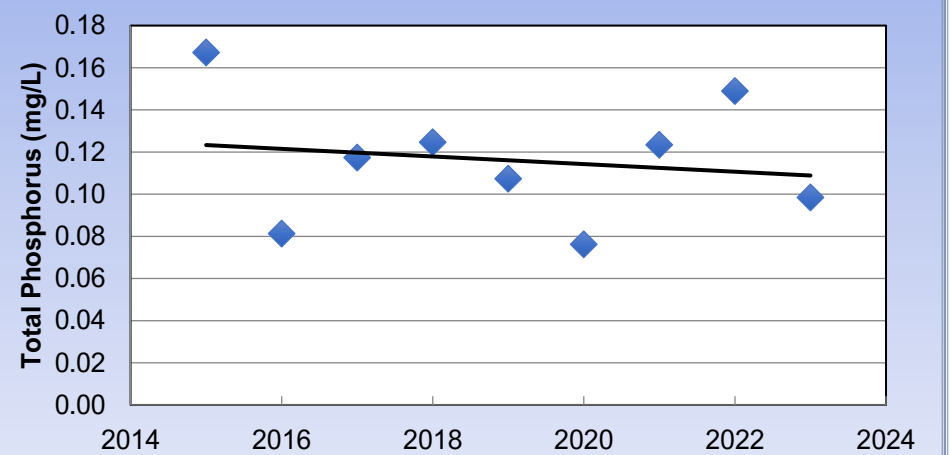


Figure B-91: Lake Rebecca Total Phosphorus



B-8 Impairments

The federal Clean Water Act requires states to identify and list water bodies that are impaired, meaning they do not meet state water quality standards. States submit their lists to the EPA every two years. Several waterbodies within the Watershed are listed as impaired. This list is ever changing, and as such, the VRWJPO directs those interested in current impairments to navigate to the MPCA's websites to see up to date listings. A current list of impaired waters can be found on the MPCA's Impaired Waters List webpage. Impaired waterbodies can also be view via the Impaired Waters Viewer map. In 2015, the MPCA completed a TMDL to quantify the pollutant reductions needed to meet state water quality standards for turbidity, bacteria and nutrients for fourteen impaired streams and lakes within the Watershed.

While the Watershed monitors water quality and biological conditions annually, the MPCA oversees an extensive examination of major lakes and streams in each of the state's 80 watersheds every 10 years to inform impaired water status decisions. The MPCA first assessed the Watershed in 2011 using data collected from 2000-2009 to establish baseline conditions. A second examination of the Watershed took place in 2020, using data collected from 2010-2019.

While monitoring results may give the impression that water quality conditions have degraded over time, the replacement of turbidity standards with TSS standards, the implementation of the tiered aquatic life use (TALU) framework, lake aquatic life biological assessments, and reaches of the South Branch Vermillion River changing from a 2B stream to a 2A stream during this timeframe should also be noted. Hundreds of BMPs, channel restoration and lake improvement projects have been implemented across the Watershed to improve water quality. However, more efforts are needed to address water quality issues and to protect waters currently supporting their designated uses.

The 2020 MPCA examination of water quality trends resulted in the following:

- Several new aquatic life impairments were added onto streams already on the Impaired Waters List: seven TSS, two dissolved oxygen, and one aluminum.
- Several biological impairments (six fish and five macroinvertebrate) resulted from revisions to water quality standards
- No new impairments were added for lakes. Scientists determined that three lakes were supporting aquatic life and five were supporting aquatic recreation. The East Bay of Lake Marion was the only one found to be supporting both designated uses.
- Several lakes had sufficient data for evaluation of water clarity trends and all were either improving or remaining stable.
- After rerouting effluent from the Empire Wastewater Treatment Plant to the Mississippi River in 2008, the Vermillion River has experienced significant reductions in nitrate and phosphorus concentrations.
- While many streams in the Watershed are listed as impaired for aquatic life, fish and macroinvertebrate IBI scores suggest that conditions are improving.

More details relating to the MPCA's examination can be found in the linked Watershed Assessment and Trends Update document.

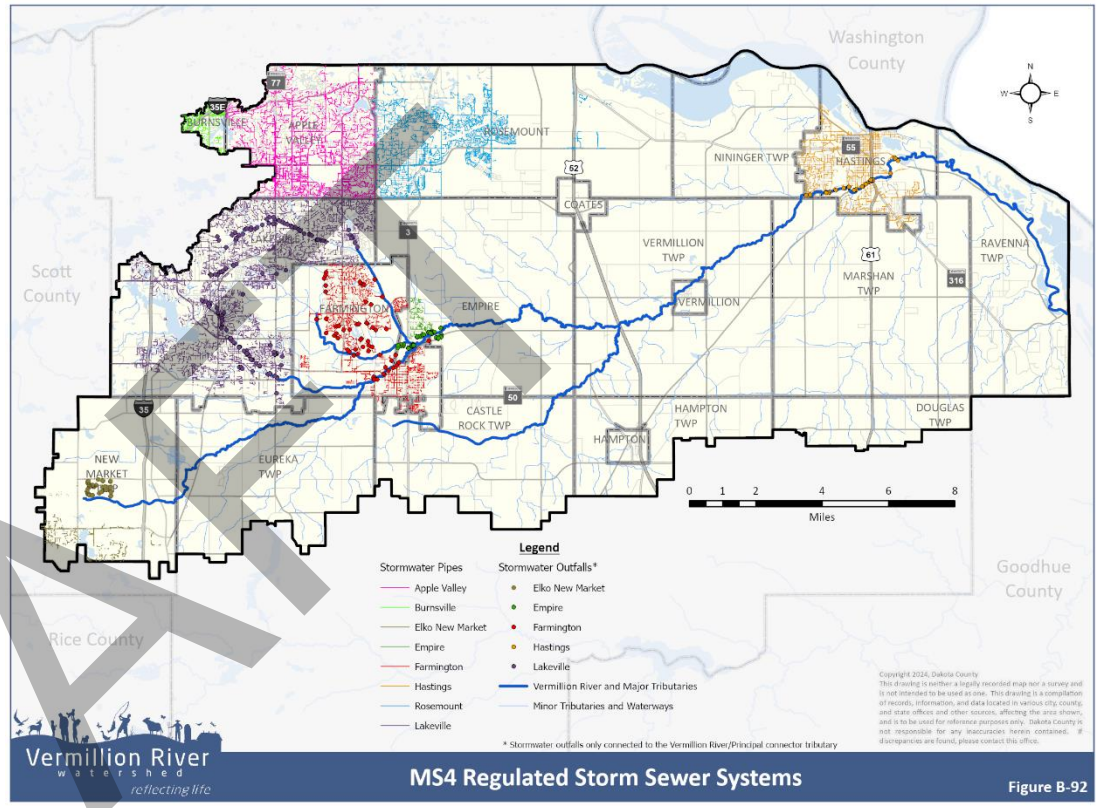
B-9 Regulated Pollutant Sources

Stormwater Systems

As previously described in Section B-1, the Watershed is a mixture of agricultural, suburban and urban landscapes. In developed areas, historic drainage patterns have been significantly altered as networks of stormwater management systems have been constructed to convey stormwater from impervious surfaces. Rural towns have smaller urban footprints, populations and lack complex stormwater systems. Conversely, municipalities such as Lakeville and Rosemount are undergoing rapid suburban and commercial development, adding miles of infrastructure that conveys stormwater to area waterbodies. Still differently, the majority of the City of Apple Valley was developed prior to the implementation of state stormwater standards, and as such makes an effort to add stormwater infrastructure as they are able to enhance area water quality.

While varying levels of stormwater system complexities exist across the Watershed, the vast majority of stormwater infrastructure eventually drains to the Vermillion River, then northeast to the Mississippi River. This drainage takes place through a stormwater system composed of pipes, outfalls, ponds, ditches, swales, constructed treatment structures and other drainage conveyances. Figure B-80 shows a high-level look at public stormwater systems that exist within the Vermillion River Watershed.

Note: due to the scale of the Watershed, the map only shows stormwater system piping and structures that drain directly to the Vermillion River or principal connectors (when available).



Stormwater conveyance systems are regulated according to the MPCA's MS4 General Permit. Those entities that must hold an MS4 General Permit and abide by all its statutory requirements are those with stormwater conveyance systems that:

- Are located in an urbanized area and used by a population of 1,000 or more
- Are owned by a municipality with a population of 10,000 or more
- Have a population of at least 5,000 and the system discharges to specially classified bodies of water

The following entities within the Watershed are required to obtain MS4 General Permit coverage from the MPCA:

- City of Apple Valley
- City of Burnsville
- Dakota County
- City of Elko New Market
- City of Empire
- City of Farmington
- City of Hastings
- City of Lakeville
- City of Rosemount
- Scott County

The MS4 General Permit is designed to reduce the amount of sediment and pollution that enters surface water and groundwater from storm sewer systems. As such, permittees must develop a Stormwater Pollution Prevention Program (SWPPP) that incorporates programs and practices to improve stormwater quality. The SWPPP must be organized according to the following areas of focus, known as Minimum Control Measures (MCMs):

- Public Education and Outreach
- Public Participation/Involvement
- Illicit Discharge Detection and Elimination
- Construction Site Stormwater Runoff Control
- Post-Construction Stormwater Management
- Pollution Prevention/Good Housekeeping for Municipal Operations

The most recent update to the MS4 General Permit was completed in 2020. All permittees are required to have MS4 programs in compliance with the items outlined in the 2020 MS4 General Permit, and to report annually on permit outcome measures.

The VRWJPO has two notable control structures just outside of its boundary. US Lock and Dam 2, owned by the USACE, is located in Hastings just outside of the watershed. Located on the Mississippi River, the original system went into operation in July of 1931. Poor soil conditions caused the lock structure to tip and resettle, requiring construction of a new lock that went into operation in 1948. A major rehabilitation to the structure was then completed by the USACE in 1995. It is one of four lock and dam systems located in Minnesota.

The second notable control structure located near the VRWJPO is the Lake Byllesby Dam & Reservoir. It is located on the southern edge of Dakota County on the Cannon River. It is owned and operated by Dakota County and has been granted a Federal Regulatory Energy Commissioner exemption to operate the internal turbines to produce electricity. It was built in 1910 and was originally owned by Northern States Power until 1969, at which time it was sold to Dakota and Goodhue counties. Dakota County became the sole owner in 2009.

In addition to the lock and dam system and dam and reservoir, a unique feature of the VRWJPO is found in Vermillion Falls Park in the City of Hastings. Just off of Highway 61 and County Road 47, the Vermillion River drops 100 feet descending from the falls. Historically, the water was used to power three Hastings flour mills at the end of the Pioneer Wheat Trail. Downstream of the falls sits the ruins of the Ramsey Mill, which burned in 1894.

Other Regulated Pollutant Sources

In addition to stormwater systems, other regulated pollutant sources and permitted wastewater discharges exist within the VRWJPO. The MPCA maintains a database of facilities with air, water and other environmental permits and registrations. Types of permits and registrations currently within the VRWJPO are those associated with:

- Feedlots
- Hazardous waste
- Solid waste
- Subsurface Sewage Treatment Systems (SSTS)
- Industrial National Pollutant Discharge Elimination System (NPDES)/SDS
- Industrial wastewater
- Underground tanks

A current inventory, including mapping of permit and registration location, can be referenced by accessing the MPCA's What's in My Neighborhood platform.

B-10 Groundwater Resources

Bedrock units include aquifers, which are geologic units that can store and transmit enough water to reasonably supply wells. Residents of the Vermillion River Watershed source all drinking water from the region's aquifers. Just like surface waterbodies, an aquifer has inputs, outputs, and storage capacity.

Water enters aquifers through infiltration from the land surface, percolation of surface water, flow from other aquifers, and/or injection wells. Aquifers discharge groundwater to surface waters as base flow, to the ground surface through seeps or springs, to other aquifers, or by withdrawals from wells. Surface water from lakes, rivers, and wetlands can move into aquifers and water from aquifers can discharge into surface water features; this nature can result in pollutant transfers. The quality and quantity of surficial and groundwater resources are directly related.

Quaternary Aquifers

The uppermost aquifers (surficial aquifers) in the watershed are in unconsolidated sediments left behind by glaciers. These "Quaternary" aquifers are not used for municipal or public drinking water supply but are a significant water source for private domestic and irrigation wells. Quaternary aquifers also provide cool groundwater that support the Vermillion River's brown and brook trout populations.

Because the thickness of glacial sediments varies dramatically across the watershed, the saturated thickness of the Quaternary aquifers varies from zero to more than 200 feet. The potential yield, or maximum rate at which water can be withdrawn from an aquifer, varies with saturated thickness. Potential yields range from less than five gallons per minute in the shallowest areas to more than 2,000 gallons per minute in the thickest areas (the buried valleys). Since most Quaternary aquifers are composed of sand and gravel, water can move very quickly through them, as much as 100,000 to 200,000 gallons per foot per day. High movement rates combined with proximity to surface activities make these aquifers highly sensitive to pollution. High nitrate concentrations have been documented in the Quaternary aquifers, and pesticide pollution is also common.

Bedrock Aquifers

Bedrock aquifers are often named for the rock unit in which they occur. The uppermost, water-producing bedrock units in the watershed, the Platteville and St. Peter formations, occur discontinuously primarily in the northwestern watershed. Both of these formations are sometimes dry or locally contain an unreliable amount of water. The St. Peter Formation is used for limited domestic wells in northern Dakota County and can become easily contaminated due to its exposure to the overlying Quaternary glacial deposits. In parts of Randolph and Castle Rock Townships, the water table is in the St. Peter formation. Recharge into the St. Peter is greatest where the Glenwood Formation is missing and sands overlay the aquifer.

The most significant and widely used aquifer in the watershed is the Prairie du Chien-Jordan, which is composed of two geologic units (dolomite and sandstone) with differing hydrologic characteristics. In Dakota County, these units are separated and act as independent aquifers. The saturated thickness of the Prairie du Chien-Jordan aquifer in the watershed extends to 300 feet. The potential water yield is similar to that of the Quaternary aquifers, ranging from under 500 gallons per minute to more than 2,500 gallons per minute.

The Minnesota Geological Survey designated most of the Prairie du Chien and Jordan aquifers within the watershed as highly- to very-highly sensitive to contamination. Sensitivity is based on geologic characteristics of the overlying rock and sediment, including the surface's ability to absorb and hold contaminants, dilute contaminants, and control the rate that contaminants move in and through aquifers. In high-sensitivity areas, contaminants can reach the aquifer within weeks to years. In very high sensitivity areas, contaminants can enter the aquifer in a matter of hours to months.

Below the Prairie du Chien-Jordan are the Tunnel City (Franconia) and the Wonewoc (Ironton-Galesville) formations. The Tunnel City formation is a low-to-moderate yield (<200 gpm) sandy dolomite aquifer, and the Wonewoc is a thin sandstone aquifer (about 50 feet thick). Neither aquifer serves as a significant source of groundwater for the watershed's population.

The deepest, high-yield aquifer available in the watershed, the Mt. Simon-Hinckley, is separated from the nearest aquifer by 200 feet of the Eau Claire Formation, a confining geologic unit with little or no permeability. Under normal conditions, the Mt. Simon-Hinckley aquifers are hydraulically isolated from the Tunnel City and Wonewoc formations.

Because of its pristine and isolated nature, appropriations from the Mt. Simon-Hinckley are addressed directly in state statute (Minn. Stat. 103G.271, Subd. 4a). The Minnesota Department of Natural Resources (DNR) is not allowed to issue permits for this aquifer in metropolitan counties unless it is for potable (drinking) water, there is no alternative source, and a water conservation plan is included in the permit.

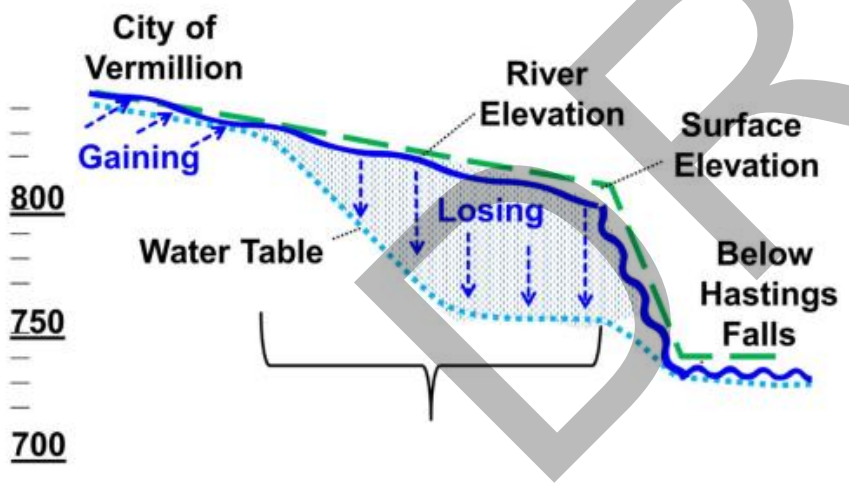
The potential yield of this aquifer is calculated to be between 650 and 1,800 gallons per minute, and several communities in the watershed use this aquifer for high-capacity industrial, municipal, and multi-aquifer wells. As a result of these wells, the Mt. Simon-Hinckley aquifer is recharged from the overlying aquifers, locally changing the flow direction and water chemistry.

Groundwater and Surface Water Connections

While surface waters often receive inputs from groundwater, it is less common for surface water to contribute volume directly to groundwater. However, one such example exists within the watershed.

Many of the upstream reaches of the Vermillion River are groundwater fed, but below the City of Vermillion, the river loses water to the underlying aquifers. Due to this nature, the Vermillion River is characterized as a "losing stream" in this reach. The South Branch subwatershed, located just upstream of this losing reach, has been found to have higher levels of nitrate. This area is of interest to staff due to its potential connection to heightened nitrate levels in the City of Hastings municipal wells and surrounding communities' private wells. See conceptual image of this trait below.

Figure B-93: Conceptual Design of Vermillion River Losing Stream Reach



Source: 2020-2030 Dakota County Groundwater Plan

B-11 Wetlands

A wetland is defined as an area that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support (and that under normal circumstances does support) a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands provide ecological, recreational, and economic benefits. They promote species diversity, flood control, erosion control, groundwater recharge and discharge and water quality protection.

Historically, wetlands were not recognized for the benefits they provide, and were often drained or filled to be farmed or developed. In Minnesota, the Wetland Conservation Act (WCA), which was passed in 1991, regulates the filling, excavation and draining of wetlands. WCA is administered by an LGU, typically staffed by city, county, or SWCD staff. The LGU is responsible for enforcing WCA standards to maintain no net loss in Minnesota wetlands. While this has changed over time, the VRW currently has the following LGUs responsible for WCA permitting within their respective political boundary:

- City of Apple Valley
- City of Burnsville
- City of Elko New Market
- City of Hastings
- City of Lakeville
- City of Rosemount
- City of Vermillion
- DCSWCD is the acting LGU for WCA permitting within the following political boundaries: Castle Rock Township, City of Coates, City of Hampton, City of Empire, City of Farmington, Douglas Township, Eureka Township,

Hampton Township, Marshan Township, Nininger Township, Ravenna Township, and Vermillion Township
- SSWCD is the LGU for WCA permitting for New Market Township

In addition, the VRWJPO holds wetland alterations standards and wetland buffer standards, which are described in detail in Appendix D. Wetland buffer standards are summarized in the table below. A wetland functional assessment for vegetative diversity is performed using a functional assessment method approved by BWSR to determine the management classification level.

Table B-7: Buffer Standards for Wetlands

Buffer Requirement	Exceptional Quality Wetland (Preserve)	High Quality Wetland (Manage 1)	Medium Quality Wetland (Manage 2)	Low Quality Wetland (Manage 3)
Average Width	50 feet	40 feet	30 feet	25 feet
Minimum Width	30 feet	30 feet	25 feet	16.5 feet

Priority Areas for Wetland Preservation

The VRWJPO places priority on preserving the hydrologic and ecological function of wetlands within the watershed. This is reflected in VRWJPO Wetland Alteration Standards (amended in 2025 as a part of this Plan update process, and incorporated in Appendix D), which states:

"It is the policy of the VRWJPO to:

A. Work to achieve no net loss of wetlands in the Watershed.

B. Replace lost wetlands in the same subwatershed whenever possible.

C. Provide equal or greater functions and values for lost wetlands at the replacement ratios dictated by the WCA.

D. Avoid direct or indirect wetland disturbance in accordance with State and Federal requirements and approved local wetland management plans.

E. Limit the use of high-quality wetlands for stormwater management where other alternatives exist.

F. Avoid fragmentation of natural areas and corridors when feasible and mitigate when unavoidable."

This policy is then furthered by mechanisms for wetland replacement prioritizing restoration within VRWJPO boundaries when wetland impacts take place. This criteria states,

"Wetland replacement/mitigation siting must follow the priority order below:

1. Mitigation within the VRWJPO boundary (on-site if approved by the WCA Jurisdictional Authority)
2. Mitigation within Dakota and Scott County
3. Within BWSR Wetland Bank Service Area 8
4. Within any other BWSR Bank Service Area

In addition to VRWJPO Standards, staff regularly assess opportunities for wetland restoration within the watershed. Through these assessments, priority wetland restoration areas are identified, based on aspects including, but not limited to: ability to maintain wetland hydrology, vegetation and soils; pollutant load reductions associated with restoration; support of ecological

corridors resultant of restoration; and proximity to special waters including trout streams or impaired waters. While these assessments provide priority areas for staff to seek restoration, the limiting factors for restoration are land ownership and landowner willingness. Assessments that provide priority wetland areas are described in further detail below.

In 2012, DCSWCD staff administered a Drained Wetland Inventory in the Upper Vermillion and South Branch subwatersheds to prioritize wetland restoration opportunities. The inventory took place via GIS assessment. The assessment used hydric soils as a primary indicator to determine historical wetland locations. Staff analyzed the Dakota County Soil Survey Geographic Database (SSURGO) and the Minnesota Land Cover Classification System to distinguish between wetlands and impervious surfaces. Once existing wetlands were identified, they were removed from the dataset. The remaining very poorly drained and poorly drained soils represented general locations with a potential for wetland restoration efforts.

The inventory found that within the Upper Vermillion subwatershed, 3,624 acres of existing wetlands made up 15% of the entire drainage area. Additionally, 3,237 acres of potential wetland (based on hydric soil presence) restoration areas existed.

In the South Branch subwatershed, 1,327 acres of wetland were found, making up 6% of the entire drainage area. 2,330 acres of hydric soil were found that could potentially provide the capacity to restore wetland characteristics.

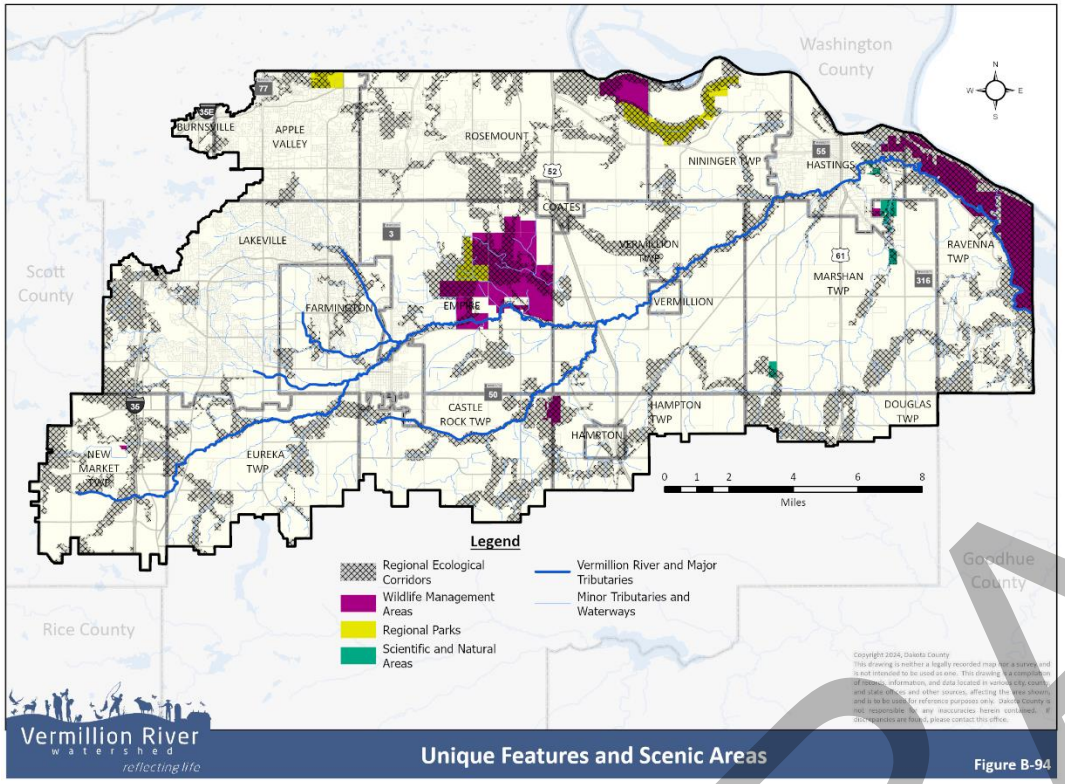
In 2017, DCSWCD staff administered another assessment to identify potential wetland restoration sites across southern Dakota County. This included areas in the Upper Mainstem, South Creek, South Branch, Middle Mainstem and Lower Mainstem subwatersheds. It identified 24 potential “hydric farmed” wetlands, totaling 3,781 acres.

In 2020, Dakota County contracted Wenck to create a 450-square mile, county-wide model to evaluate flooding and water quality in rural reaches of the County, including all of the VRW as well as the North Cannon River Watershed. The goal of the study was to identify flood-prone areas for potential water quality improvement and wetland restoration. Methods included review of flood insurance study reports and models, river gauge data, survey data, a PC-SWMM model and GIS files. The 2020 model identified 59 potential wetland restorations in the full study area and ranked them by priority according to their flood area, flood volume, TSS load reduction and TP load reduction potentials. The top ten ranked projects were then further analyzed and preliminary water retention berm alignments were developed. Water quality benefits were then evaluated using the P8 software. Project cost estimates were also developed.

The VRWJPO has been involved in a number of wetland restorations over the years, for reasons including water quality improvement, habitat enhancement and wetland bank establishment. Staff continue to reference priority area wetland preservation studies when assessing potential restoration sites.

B-12 Fish and Wildlife

The Vermillion River Watershed is home to a number of Unique Features and Scenic Areas, as shown in *Figure B-94*. Details pertaining to these features, as well as the ecological subsections within the Watershed, are described below.



Ecological Classification Subsections

The DNR and the U.S. Forest Service developed a statewide Ecological Classification System (ECS) that identifies, describes, and maps land areas with uniform ecological features. The ECS draws on climate, geology, topography, soils, hydrology, and vegetation characteristics for its classifications. The ECS has eight levels of classification, and the subsection level is discussed in this plan. The watershed includes parts of four distinct Ecological Subsections.

Big Woods Subsection

The far western portion of the Watershed, including the City of Elko New Market and New Market Township, is classified as within the Big Woods Subsection. The subsection coincides with a large block of deciduous forest that was present at the time of Euro-American settlement. Topography is gently to moderately rolling. Soils are formed in thick deposits of gray limey glacial till left by the Des Moines lobe. Northern red oak, sugar maple, basswood, and American elm were most common in this dominantly forested region.

The majority of this subsection is cropland, with sparse amounts of pasture, upland forest or wetland. Big Woods habitats feature woodland birds, such as red-shouldered hawks and warblers, savanna species such as Blanding's turtles and red-headed woodpeckers, and wetland species such as turtles, ospreys, Forster's terns, and black terns.

Rochester Plateau Subsection

The southeastern part of the Watershed, including parts of Marshan, Douglas, Vermillion, and Hampton townships, are located in the Rochester Plateau Subsection. This subsection consists of an old plateau covered by loess in the east and pre-Wisconsin age glacial till in the central and western parts. The majority of this unit is heavily farmed.

Wildlife present in this subsection include a variety of reptiles, such as timber rattlesnakes, western foxsnakes, racers, Blanding's turtles and wood turtles; birds, including Louisiana waterthrushes, prothonotary warblers, cerulean warblers, blue-winged warblers, peregrine falcons; fish, including American brook lampreys and suckermouth minnows; and mussels, such as ellipse mussels.

St. Paul Baldwin Plains and Moraines Subsection

This subsection encompasses much of the eastern Twin Cities and is dominated by urban land uses. Oak and aspen savannas were primary plant communities before European settlement; tallgrass prairie and maple-basswood forest were also common. The Mississippi River flows through the center of this subsection and the St. Croix River forms its eastern boundary. It is a significant migratory corridor for birds. Mussels and fish depend on the clear, unpolluted waters of the St. Croix. Featured species include bald eagles, peregrine falcons, red-shouldered hawks, Blanding's turtles, trumpeter swans, hooded warblers and bobolinks. Recreational opportunities abound in state and regional parks, scientific and natural areas, and nature centers.

The Blufflands Subsection

The far eastern part of the Watershed, including Hastings and Ravenna Township, is in the Blufflands Subsection. This subsection consists of an old plateau covered by loess that has been extensively eroded along rivers and streams. It is characterized by highly dissected landscapes associated with major rivers in southeastern Minnesota. Tallgrass prairie and bur oak savanna were major vegetation types on ridge tops and dry upper slopes. Red oak-white oak-shagbark hickory-basswood forests were present on moister slopes, and red oak-basswood-black walnut forests in protected valleys. Prairie was restricted primarily to broader ridge tops, where fires could spread, but also occurred on steep slopes with south or southwest aspect.

Bluffs and deep stream valleys (500 to 600 feet deep) are common. River bottom forests grew along major streams and rivers. About 35 percent of this subsection is cropped, 23 percent is in pasture, and 33 percent is in woodland. The Blufflands provide a critical migratory corridor for forest songbirds, raptors, and waterfowl. It is the most important subsection for reptiles and one of the most important subsections for mollusks.

DNR Scientific and Natural Areas

The SNA program preserves natural features and rare resources of exceptional scientific and educational value, three of which are in the Watershed.

- Hastings SNA (64.9 acres) is located within the Vermillion/Mississippi River floodplain within the City of Hastings. Talus slopes and steep escarpments of dolomitic limestone provide habitat for mosses, lichens and liverworts. The SNA boasts a wide variety of spring ephemerals including snow trilliums, dutchman's breeches, bloodroot and wild ginger. Upwards of seventeen state-listed threatened and endangered species, as well as one federally endangered species, are found within a mile of the site.
- Hastings Sand Coulee SNA (267 acres) is situated in a sandy ravine, or "coulee", formed by a glacial stream that flowed into the Vermillion River. The site is home to the largest dry prairie and associated oak woodland in Dakota County, boasting over fifteen rare plant and animal species such as the loggerhead shrike, fritillary butterfly and rusty-patched bumble bee. The site provides a safe haven for resident animals as well as a vital rest stop for migratory birds who depend on the Mississippi migratory flyway.
- Chimney Rock SNA (76 acres) in Marshan Township, escaped the last glacial advance and is characterized by deposits of loess over bedrock. The site contains a significant geologic feature consisting of three St. Peter Sandstone chimney formations capped by Platteville

Limestone. The SNA also has four native plant communities characteristic of dry sandy soils underlying the site.

DNR Wildlife Management Areas

WMAs are part of Minnesota's outdoor recreation system established to protect lands and waters with high potential for wildlife production, public hunting, trapping, fishing, and other compatible recreational uses. Five are in the VRWJPO's boundaries.

- Gores Pool #3 WMA (7,092 acres), partly in Hastings and Ravenna townships, consists of Mississippi and Vermillion River Flood Plain forest and backwater marshes. A designated Migratory Waterfowl Refuge near the south end of North Lake is off limits to all activities.
- Hampton Woods WMA (207 acres) is one of the largest and most diverse contiguous forested areas of southern Dakota County, mostly mesic oak forest with a great diversity of tree, shrub, and forb species. Game species include deer, small game, upland forest birds, turkey, and doves. This WMA is south of County Highway 50 and east of US Highway 52.
- Hastings WMA (40 acres) consists of restored prairie, several small woody plantings and woodlands and provides upland habitat. It is located just west of Gores Pool #3 WMA and the Mississippi River. Hastings Sand Coulee SNA is adjacent to the eastern boundary.
- Vermillion Highlands Research, Recreation, and WMA (2,838 acres) were established by the State as part of the University of Minnesota (U of M) stadium agreement in 2006. The unit, managed by the DNR and U of M, provides recreation for the public and research opportunities for the University. Portions of the WMA are open for in-season hunting of certain species throughout the year.
- Vermillion River WMA (1,493 acres) is adjacent to the south boundary of the Vermillion Highlands Research Recreation and WMA along the Vermillion River in Empire Township. Much of this WMA was intensively farmed in the past except for the central area, which has remnant prairie species. Significant portions of the WMA have now been restored to native prairie. Recreation opportunities include hunting, fishing, birding, and nature photography.
- Spartina WMA in New Market Township (Scott County) is located entirely within a drained wetland basin. It is located within an area of scattered woods and wetlands, and the predominant vegetation is lowland shrubs and trees, some wetland and some grassland. This unit is managed for wetland species as well as species that prefer brushland.

DNR Aquatic Management Areas

Aquatic Management Areas (AMAs) are areas acquired along shorelines to provide angler and management access, protect critical shoreland habitat, and provide areas for education and research.

- Gores Pool #3 AMA (162 acres) is adjacent to the Gores Pool #3 WMA in northeastern Hastings. The AMA includes Mississippi and Vermillion River shoreline, floodplain, and upland areas. Recreational uses include fishing, non-motorized travel, wildlife observation, hunting, and trapping.
- South Branch Vermillion River AMA (62 acres) is located west of US Highway 52, south of County Highway 66 in Empire Township. It includes a section of the South Branch of the Vermillion River. Recreational use includes trout

fishing, non-motorized travel, wildlife observation, hunting, and trapping.

- Vermillion River AMA (460 acres over seven units) in Empire includes several, non-contiguous sections of the Vermillion River which are designated trout streams. Recreational uses include angling, non-motorized travel, wildlife observation, hunting and trapping.

B-13 Rare and Endangered Species

Endangered Species

Minnesota has a rich natural heritage, but many species seen by early explorers of the state no longer exist or survive only in small, fragmented populations. To prevent further losses, the state Legislature passed Minnesota's Endangered and Threatened Species law in 1971, directing the DNR to identify species at greatest risk of disappearing from the State. The DNR manages endangered species regulations, permitting, and environmental review processes.

The DNR Natural Heritage Information System (NHIS) databases identify several species listed by the U.S. Fish and Wildlife Service as federally endangered or threatened that are potentially found within the watershed. Of note, the mussel species primarily are found in the Mississippi River and other deep rivers. Species information is from the U.S. Fish and Wildlife Service.

- **Rusty Patched Bumblebee**, listed as federally endangered in 2017 after a widespread and steep decline in populations. While the cause of the decline remains unclear, evidence suggests a synergistic effect between pesticides and an introduced pathogen. Historically, the rusty patched bumble bee was broadly distributed across the Eastern U.S. and Upper Midwest.
- **Higgins Eye Pearlymussel,** a federally endangered freshwater mussel, depends on deep, free-flowing rivers with clean water and is typically found in the Mississisppi River above Lock and Dam 9 at Keokuk, Iowa. Municipal, industrial, and farm run-off have degraded water quality in areas preferred by Higgins eye. Mussels concentrate chemicals and toxic metals in body tissues and can be poisoned by chemicals in their water. Dredging and waterway traffic produce siltation, which can cover river substrate and mussel beds. Zebra mussels attach to pearlymussels and prevent them from moving, burrowing, or opening and closing their shells.
- **Sheepnose**, a federally endangered freshwater mussel that is now considered extirpated from roughly 75 percent of its historical range. Primary risks to this species include contaminants, hydrological regime changes, landscape alterations, lack of connectivity and invasive species.
- **Snuffbox**, a federally endangered freshwater mussel, is declining throughout its range due to habitat modification and destruction, sedimentation, and pollution. Despite this, it remains the most widespread and abundant member of the genus Epioblasma, of which the other members are now either extinct or severely imperiled.
- **Spectaclecase**, a federally endangered freshwater mussel, is found in the Mississippi, Missouri, and Ohio River basins. The Spectaclecase requires very specific habitat, which limit its current range and distribution to certain sites within large rivers. Generally, mussels are long-lived, with individuals surviving up to several decades, sometimes up to 100 to 200 years. The oldest documented Spectaclecase was thought to be 70 years old. Major

threats to the Spectaclecase mussel include dams, small population size and fragmentation, sedimentation and pollution. Dams have contributed more to the decline and potential extinction of the Spectaclecase than any other factor.

- **Winged Mapleleaf**, a federally endangered freshwater mussel. Winged Mapleleaf were once found in 38 locations in the Midwest from Minnesota to Arkansas but are now found only in six. This mussel spends most of its time buried in sediments and is primarily sedentary. The St. Croix River in Minnesota contains the only populations known to be reproducing. Two of the main threats to the winged mapleleaf are habitat fragmentation, small population size, and invasive species (Zebra Mussels).
- **Northern Long-eared Bat**, a federally endangered mammal, was proposed for listing because of a disease called white-nose syndrome. The disease is thought to kill hibernating bats by using up their stored energy too rapidly. Gates or other structures to exclude people from caves and mines restrict bat flight and movement, change airflow, and change internal cave and mine microclimates. A few degrees change can make a cave unsuitable for hibernating bats. Note: not currently in NHIS data for the watershed area.
- **Prairie Bush Clover** is a federally threatened prairie plant found only in the tallgrass prairie region of four Midwestern states, including Minnesota. It is a member of the bean family and a Midwestern "endemic" – known only from the tallgrass prairie region of the upper Mississippi River Valley. Some of the surviving populations are threatened by conversion of pasture to cropland, overgrazing, agricultural expansion, herbicide application, urban expansion, rock quarrying, and transportation right-of-way maintenance and rerouting. Note: not currently in NHIS data for the watershed area.

The DNR implements regulations, permits, and environmental reviews affecting these species. However, managers aware that certain species are endangered, threatened, or of special concern have a better chance of addressing issues and maintaining a diverse and sustainable population of plants, animals, and aquatic species.

Minnesota's List of Endangered, Threatened and Special Concern Species can be accessed here. In addition, information about federally listed species can be found here.

B-14 Water-based Recreation

Both Dakota and Scott counties have areas with rapidly expanding populations. Substantial planning in both counties ensures that parks and open spaces are protected.

Dakota and Scott counties acquire easements to provide permanent protection for prime farmland, natural areas, and shoreland. A current map of protected lands in Dakota County is available on the Dakota County website, www.dakotacounty.us, term search *land conservation map summary*.

Dakota County conducted a Vermillion River Corridor planning and visioning effort in 2010 to ask people what they perceived as the river's best future condition and how it could be achieved. The Corridor Plan focused on improvements to water quality, habitat, and recreation opportunities. Dakota County parks within (or affecting the hydrology of) the Vermillion River Watershed include:

- Lebanon Hills Regional Park in Eagan
- Spring Lake Park Reserve in Hastings

- Whitetail Woods Regional Park in Empire
- Dakota Woods Dog Park in Rosemount

Dakota County trails and greenways in the watershed include:

- Mississippi River Greenway
- North Creek Greenway
- Lake Marion Greenway
- Vermillion Highlands Greenway
- Vermillion River Greenway
- Rosemount Greenway

Each park has a guiding plan, available at www.dakotacounty.us, search *park plans*.

Lake Marion and Lake Rebecca are widely used for recreation. Preventing Lake Marion water quality from impairment for nutrients is a priority for the City of Lakeville and the VRWJPO. The VRWJPO has provided cost-share for projects to help the City of Lakeville prevent impacts of excess nutrients on Lake Marion.

Canoeing and kayaking opportunities in the Vermillion River main stem, primarily east of U.S. Hwy 52 and on the Vermillion River Bottoms (below the falls), can be accessed at road crossings at the road rights-of-way or on public land.

Because approximately 90 percent of the land along the Vermillion River corridor is privately owned, users of the river for canoeing and kayaking must be sensitive to the rights of landowners. However, the lower main stem of the Vermillion River and the Vermillion River Bottoms could see increased use for canoeing and kayaking in the future.

The VRWJPO provides an online mapping resource for people interested in fishing, canoeing, or kayaking the river.

Appendix C: Community and Stakeholder Engagement

In accordance with Minnesota Rule 8410.0045, the Plan was developed in consultation with stakeholders and officials in the Vermillion River Watershed, including:

- Residents and businesses
- City and township officials
- Dakota and Scott County governments
- State and regional agencies
- Dakota and Scott County Soil & Water Conservation Districts (SWCDs)
- Environmental organizations
- Agricultural organizations
- Recreational groups
- VRWJPO TAC
- VRWJPO CAC
- JPB

To ensure Watershed stakeholders, officials, and residents were engaged in Plan development meaningfully, VRWJPO staff developed a PEP in July 2023. The primary objectives of the PEP included:

- Collect data to best inform VRWJPO staff and JPB throughout the Plan revision process, including attitudes, behaviors, issues, and priorities related to the Watershed.
- Discuss and receive feedback on any proposed Plan goals, objectives, and actions with relevant stakeholder groups.
- Request feedback, ideas, and opinions from the stakeholder groups to:
- Identify and assess challenges within the Watershed for groundwater and surface water restoration and protection and determine strategies for addressing those challenges
- Identify opportunities for and barriers to implement and/or to follow proposed Plan strategies
- Understand the level of support for prospective Plan strategies
- Provide accurate, relevant, and timely information to help all of those involved understand the Plan revision process and prospective strategies for them to make informed comments and recommendations

Public engagement was completed in three rounds:

- **Opening Comments and Issue Identification:** Spring-summer 2023, identified key issues to address in the plan.
- **Issues and Priorities:** Fall-winter 2023-2024, focused on further identifying and prioritizing issues.
- **Goal and Objective Development and Prioritization:** Fall 2024, focused on reviewing and discussing Plan goals, objectives, and priorities.

VRWJPO hired a consulting firm to facilitate the PEP.

C-1 Opening Comments and Issue Identification

The JPB authorized the Plan update process to begin on March 23, 2023 (VRW Resolution 23-08). The VRWJPO sent an official notice of the Plan update to the state-designated Plan review agencies on April 3, 2023. In the notice, agencies and interested parties were given 60 days to provide comments relating to:

- Priority issues or opportunities and management expectations
- Water management goals for the next 10 years
- Water resource data, reports, and other relevant materials

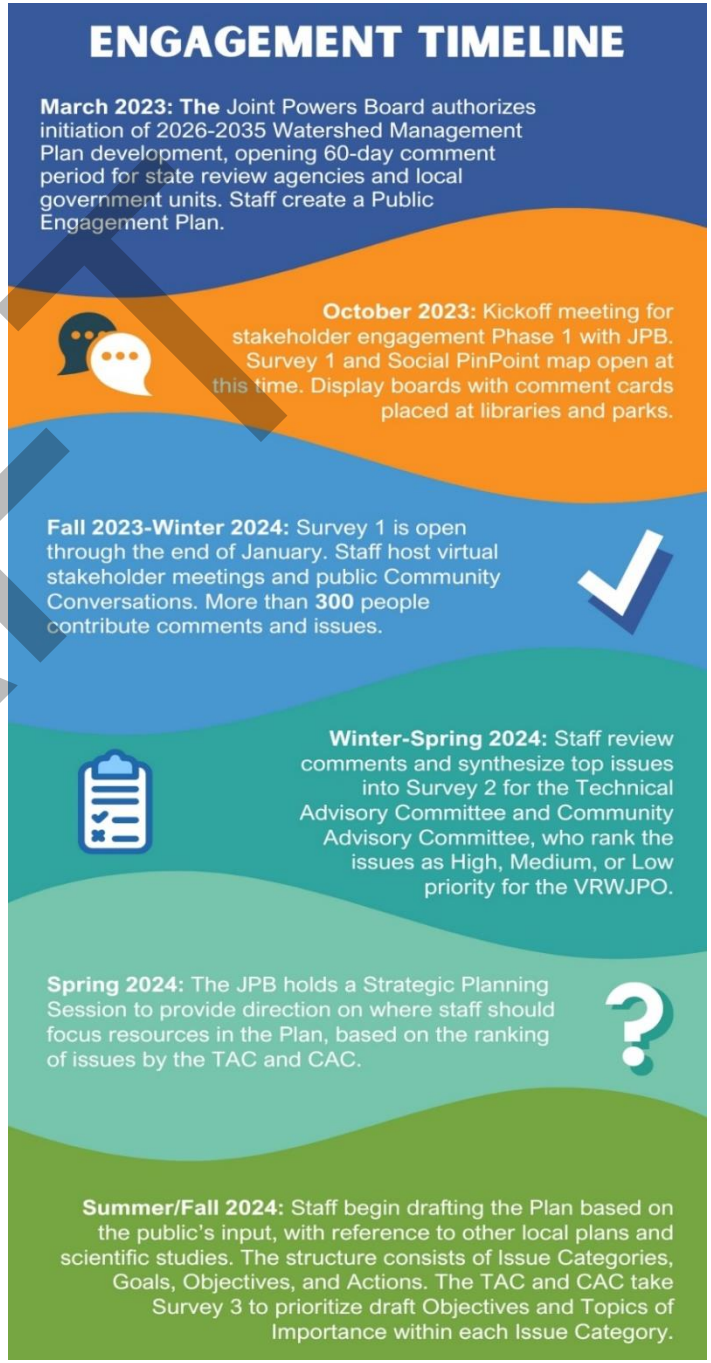
State and regional review agencies include:

- Minnesota Board of Water and Soil Resources (BWSR)
- Minnesota Department of Agriculture (MDA)
- Minnesota Department of Health (MDH)
- Minnesota Department of Natural Resources (DNR)
- Minnesota Department of Transportation (MNDOT)
- Metropolitan Council
- Minnesota Pollution Control Agency (MPCA)

The same notice was also provided to representatives from:

- Black Dog Watershed Management Organization (WMO)
- Castle Rock Township
- City of Apple Valley
- City of Burnsville
- City of Coates
- City of Elko New Market
- City of Empire
- City of Farmington
- City of Hampton

Figure C-1: Image of Phase 1 of Engagement



- City of Hastings
- City of Lakeville
- City of Rosemount
- City of Vermillion
- Dakota County
- Dakota County Farm Bureau
- Dakota County Farmers Union
- Dakota County SWCD
- Douglas Township
- Eagan-Inver Grove Heights WMO
- Eureka Township
- Freshwater
- Hampton Township
- Hmong American Farmers Association
- Lower Mississippi River WMO
- Marshan Township
- New Market Township
- Nininger Township
- North Cannon River WMO
- Prairie Island Indian Community
- Ravenna Township
- Scott County
- Scott SWCD
- Vermillion Township

Comments were received from three cities (Apple Valley, Empire, and Rosemount), Dakota County Environmental Resources Department, Dakota County SWCD, Metropolitan Council, BWSR, DNR, and MPCA.

To summarize the comments received during this initial period and were organized into general categories:

Surface water concerns

The watershed is encouraged to address impairments through various restoration efforts that target their root causes, as well as protecting those waters not on the EPA's impaired waters list through proactive implementation of BMPs.

- Expand efforts to address chloride pollution, utilize Twin Cities Metropolitan Chloride Management TMDL, and consideration of Twin Cities Chloride Management Plan (MPCA) and the Regional Assessment of Chloride in Select Twin Cities Metro Streams (Met Council)
- Consider metrics in the Plan to encourage communities to look at a sample ordinance on chloride use
- Incorporate and implement strategies to address TMDLs
- Implement best management practices and innovative management techniques to reduce stormwater/nutrient and sediment runoff from surrounding commercial, residential and agricultural land
- Address impaired lakes and streams within the watershed
- Address impairments due to high levels of E. coli and/or fecal coliform due to feedlots, land application of manure, cattle in riparian areas, and leaking septic systems
- Identify water bodies that are "nearly or barely" impacted, and prioritize keeping them from being impaired or work toward delisting
- Seek implementation activities that provide multiple benefits to water (quality, quantity, habitat, recreation)
- Target projects in areas with highest contributors of pollutants
- Consider testing Vermillion River for per- and polyfluorinated substances (PFAS)

Groundwater sustainability

- Participate in water supply/conservation initiatives
- Consider strategies that promote water conservation practices and projects
- Consider strategies that promote water reuse, such as reuse of stormwater and wastewater to offset groundwater demand for irrigation
- Maintain and enhance aquifer recharge
- Support Dakota County ACRE Plan
- Refer to Dakota County drinking water studies in planning process

Stormwater/Flooding

- Keep water where it falls by protecting and restoring wetlands, ensuring water courses are connected to their floodplains, and managing stormwater runoff with rate control and volume reduction standards.
- Reduce the flow of water volume and nutrients through drainage systems.
- Design culverts and bridges to retain floodplain functions and bank stability on natural channels and other drainage systems.
- Consider re-evaluating 100-year floodplain risks for riparian areas based on most recent local model data and extreme rain events
- Reduce peak flow and volume of surface water runoff in areas that experience flooding or excessive soil loss
- Consider stormwater discharge needs of communities within the watershed
- Address the need for infiltration on sandy soils
- Address storm sewer infrastructure capacity and corresponding flooding problems

Climate resiliency

- Address climate change and prioritization and expanded efforts related to climate resiliency
- Address changing weather patterns and extreme weather events
- Tools include Climate Resiliency Toolbox and climate vulnerability assessment (CVA)

Land use/Development

- Support land use planning and practices that protect, restore, and enhance priority ecological resources
- Minimize impacts of shoreline development
- Do not change requirements for setbacks for new home construction
- Promote green infrastructure
- Support Minimum Impact Design Standards (MIDS) and the LID approach
- Consider goals and objectives that will increase voluntary adoption of agricultural best management practices and alternate management tools
- Do not recommend changes to agriculture/farming practices
- Address soil erosion problems, and consider programs to protect or restore soil health
- Refer to Dakota County Model Mining Ordinance to minimize impacts of aggregate mining on groundwater quality
- Keep wetland protection and management plans up to date

- Request that developers building significant amounts of impervious surfaces develop a chloride management plan

Habitat/Recreation

- Support use of BWSR-approved, weed-free, native seed mixes to provide pollinator habitat
- Address AIS and best management practices in watershed project plans and designs
- AIS such as Eurasian watermilfoil and curly-leaf pondweed may require herbicide or mechanical treatment to stop them from being a recreational nuisance
- Require NHIS review as early in planning stage of projects as possible
- Plan for impacts of Emerald Ash Borer (EAB)
- Address impacts to recreation opportunities
- Maintain and enhance native perennial vegetation as well as native buffers
- Understand causes of streambank erosion before attempting to stabilize streambanks

Collaboration

- Increase coordination and communication activities between organizations
- Consider other agency priorities under the Prioritized, Targeted and Measurable criteria for development of goals and objectives to align efforts and allow for pooling of resources

Administration

- Refer to MN Rule 8410, MN Stat 103B, and the One Watershed One Plan Guidebook for developing plan
- Plan must include measurable goals for water quantity, water quality, public drainage systems, groundwater, wetlands, and other identified priority issues
- Plan should consider recent plans and processes to include the Dakota County Groundwater Plan, Dakota County ACRE Plan, Minnesota Groundwater Protection Rule, Dakota County Model Mining Ordinance
- Address issues, problems, capital projects, or land use changes related to regional parks
- Address concerns identified in subwatershed assessments
- Public input process should consider diversity, equity, and inclusion elements and incorporate environmental justice principles
- Conduct integrated water resource management by utilizing the Watershed Health Assessment Framework interactive online map
- Utilize the Met Council Priority Water lists to help inform policies and activities
- Ensure opportunities for Draft Plan review are provided

Education/Outreach

- Consider promoting homeowner education for proper use and maintenance or septic systems
- Consider partnering on education and outreach opportunities with private well owners
- Increase communication about the risks of overuse and degradation of groundwater resources
- Promote education of the public on the control of and spread of aquatic and terrestrial invasive species
- Target lakeshore owners and lake associations to help increase compliance with AIS laws
- Partner on Smart Salting Training and certification efforts

- Partner on turf management and low-input turf workshops to reduce irrigation and chemical use on lawns

Monitoring/Research

- Identify policies and strategies related to monitoring of area water resources
- Identify and provide information regarding emerging contaminant concerns
- Monitor water levels as it relates to water quantity/sustainability
- Identify issues concerning surface water and groundwater interaction
- Increase coordination of monitoring activities between organizations - groundwater monitoring data is available through Dakota County; Met Council water body monitoring is available on the EIMS website

C-2 Issues and Priorities

This round of stakeholder engagement focused on introducing the VRWJPO to the public, working to educate them about the VRWJPO's mission and goals, helping them to understand the types of projects and activities that the VRWJPO conducts within their communities, and seeking their input on the issues or priorities they'd like the VRWJPO to address in the Plan. A combination of outreach methods was used to collect feedback.

Table C-1: Engagement in Phase 1 Events

Method	Participation	Audiences Engaged
Initial Planning Meeting	29	Cities Environmental/Habitat Organizations Dakota County and Affiliates Metropolitan Council State Agencies
Public Surveys	153	Residents and visitors
Social Pinpoint	13	Residents and other stakeholders
Displays	n/a	Park and library visitors
Virtual Stakeholder Meetings	31	Cities and townships State agencies Environmental/Habitat Organizations Residents
Pop-Up Events	60	Farm Market at Brand Farms Indoor Farmers Market, Apple Valley
Community Conversations	26	Residents Recreation Interests Volunteers City representatives
Advisory Committee Surveys		TAC, CAC
	312	**Total Participants**

Initial Planning Meeting

VRWJPO staff hosted an initial planning kick-off meeting on October 12, 2023, as required by state rules. VRWJPO provided legal public notice of this meeting and distributed the notice to the review agencies and stakeholders.

The purpose of the meeting was to discuss watershed management issues and priorities that stakeholders and the public wanted to include in the updated Plan. In addition, staff wanted to communicate comments received to date, the planned opportunities to provide input throughout the planning process,

and to provide attendees time to share feedback via display boards, take a public survey (Survey 1) on paper or electronically, or mark locations of interest or concern on a Social Pinpoint map.

Twenty-nine people attended, representing: the JPB, the CAC, Dakota County, Dakota County SWCD, MDH, Met Council, Twin Cities Trout Unlimited, the City of Farmington, the City of Empire, Apple Valley Eco Advocates, and the Minnesota Water Stewards.

Online and Paper Surveys

163 completed surveys were received (135 online, 28 hard copies). Survey 1 was offered in English and Spanish. Questions asked ranged from opinions on the existing mission statement to personal views on goals, issues, and concerns. Demographic questions helped capture a snapshot of who was able to be reached:

- 74 residents of the watershed
- 6 non-white respondents
- 5 low-income respondents
- 59 business, industry, agriculture, or non-profit agency stakeholders
- 11 respondents representing regional boards or agencies, such as counties, SWCDs, Metropolitan Council
- 72 respondents from environmental organizations, such as Hastings Environmental Protectors and Twin Cities Trout Unlimited

Display Boards

- **Four public libraries** – Farmington, Lakeville, Hastings, and Elko New Market libraries hosted displays of printed materials that informed the public about the planning process, directed them to online resources, and collected in-person surveys and comment cards.
- **Two Dakota County parks** – Lebanon Hills Regional Park Visitor Center (Apple Valley/Rosemount) and Whitetail Woods Regional Park (Empire) hosted similar displays with links to digital feedback methods. Lebanon Hills offered paper survey materials.

Social Pinpoint

13 total comments. This interactive mapping tool allowed visitors to voice their thoughts and opinions on geographically specific projects, features, and areas of concern within the watershed.

Community Conversations

26 total attendees. Two in-person Community Conversations were held in Lakeville and Hastings in January 2024. Open to the public, these meetings consisted of a short presentation followed by informational displays, conversation, and activities. Attendees could fill out Survey 1 and spin for prizes. Attendees included Vermillion River Watershed Joint Powers Board members (Dakota County Commissioners Mike Slavik, Bill Droste, and Mary Liz Holberg, and Scott County Commissioner Tom Wolf), Hastings Mayor Mary Fassbender, as well as representatives from Twin Cities Trout Unlimited

Virtual Stakeholder Engagement Meetings

31 total attendees. Six virtual meetings were held with specific stakeholder groups (cities, townships, state agencies, nonprofits, citizen groups) in the watershed to discuss the existing watershed management plan goals and what issues or priorities were important in the new plan. Conversations centered around what is

working well, what needs improvement, and possible solutions and resources moving forward.

Pop-Up Events

About 60 people engaged. VRWJPO and their consultant tabled at two community events – a fall market at Brand Farms (Empire) in October 2023 and an indoor farmers' market in Apple Valley in January 2024 - to gather input from the public. Board displays, activities, and surveys were used to draw in conversation, educate about the watershed's role and plan update, and collect feedback on existing concerns. Coloring sheets were provided as a children's activity.

Figure C-2: Photos of Phase 1 Engagement Events

Key Takeaways from Stakeholders

The following emerged as top priorities among commenters for where the VRWJPO should focus efforts over the next 10 years:

Protecting Water Quality and Quantity

- Maintain or improve water quality in the watershed
- Address contaminants such as nitrates, phosphorus, chlorides, and emerging contaminants such as PFAS
- Ensure that groundwater use will remain sustainable, and aquifers will not be at risk from excessive pumping or drawdown
- Best management practices (such as water reuse) and public education

Monitoring and Mitigating Impacts from New Developments

- Impacts of development on habitat, biodiversity, wetlands, and shorelines with population and economic growth
- Knowing what rules developers must abide by and how to monitor impacts on the watershed
- More education about authority, collaboration on rules/regulations, and enforcement strategies

Desire for More Education/Outreach

- Encourage opportunities to become more involved with stakeholder groups (e.g., Master Gardeners, Trout Unlimited, Minnesota Lakes & Rivers) to publicize existing programs and funding opportunities
- Connect with agriculture groups
- More education about private wells, septic systems, overuse of groundwater, AIS controls, reducing salt use, and low input turfgrass

Support for More Investment

- Maintain the watershed's assets and a willingness to increase funding, so long as there is continued education and information about where those dollars are being spent. Sixty-two percent of respondents said they supported additional financial investment in the watershed, with 88 percent of that group indicating they'd be willing to pay $20-100 more.

Concerns about Trout Populations and Stream Health

- Among survey respondents, 66% currently fish rivers and creeks within the watershed
- Stream temperature monitoring, additional stocking, and protecting spawning habitat

Climate Change

- Climate change effects on fish populations and stream temperatures from droughts and rainfall amounts
- Stakeholders are interested in more ways to help mitigate the impacts and evaluate vulnerabilities to improve climate resilience, such as protecting and restoring wetlands and improving drainage systems.

Assistance, Programs, and Funding

- Programs and funding available to and through the VRWJPO
- Programs that help implement cover crops
- outside grants that might be available for large-scale watershed projects

Role in the Region – Regulations and Enforcement

- Need for more education, public outreach, and clear messaging about the VRWJPO, what it does for the community, how it relates to other agencies, and what role it plays in their day-to-day lives
- Confusion about the rules and regulations the VRWJPO can and cannot enforce

CAC and TAC Issue Prioritization

After the completion of the public engagement process, the CAC and TAC members were each invited to take a survey (Survey 2) on 25 issues identified in the stakeholder engagement phase of the planning process. Participants were asked to rate the identified issues on relevance to the VRWJPO's work and priority level.

1. **Watershed Role** in the Issue

- Essential JPO activity
- Good for JPO to do when possible
- Not JPO's work

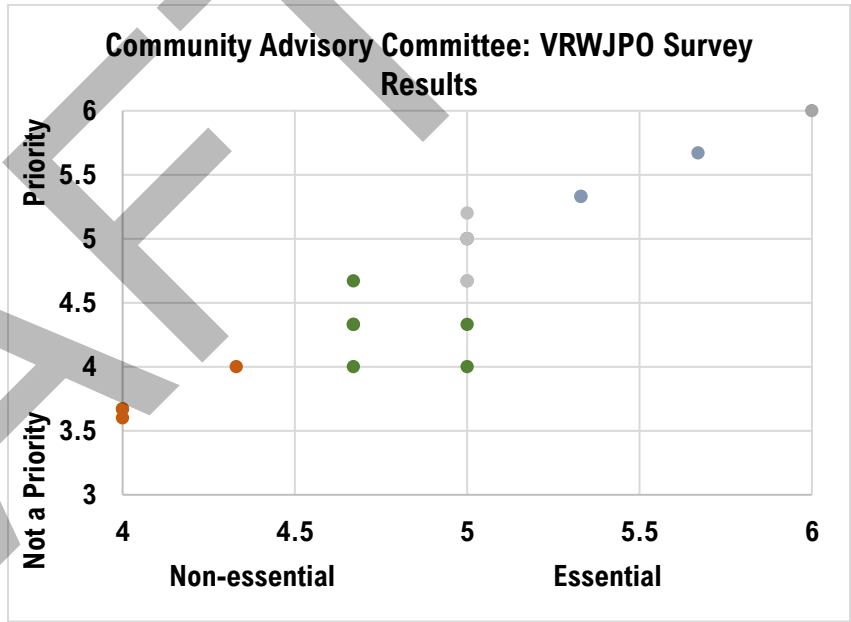
2. Watershed Plan Priority (Essential or Good for the JPO to address)

- High
- Medium
- Low

CAC members rated each issue on a scale of 3.0 to 6.0 for relevance and plan priority. The combined scores are in the following graph.

Note: Issues with identical rating scores are plotted at the same point in the graph. Points in the upper right quadrant were identified as highly relevant for the VRWJPO's work and high planning priorities.

Figure C-3: CAC Issue Prioritization Survey Results



Issues receiving a score of 4.5 (the midpoint value) or greater for relevance and priority included:

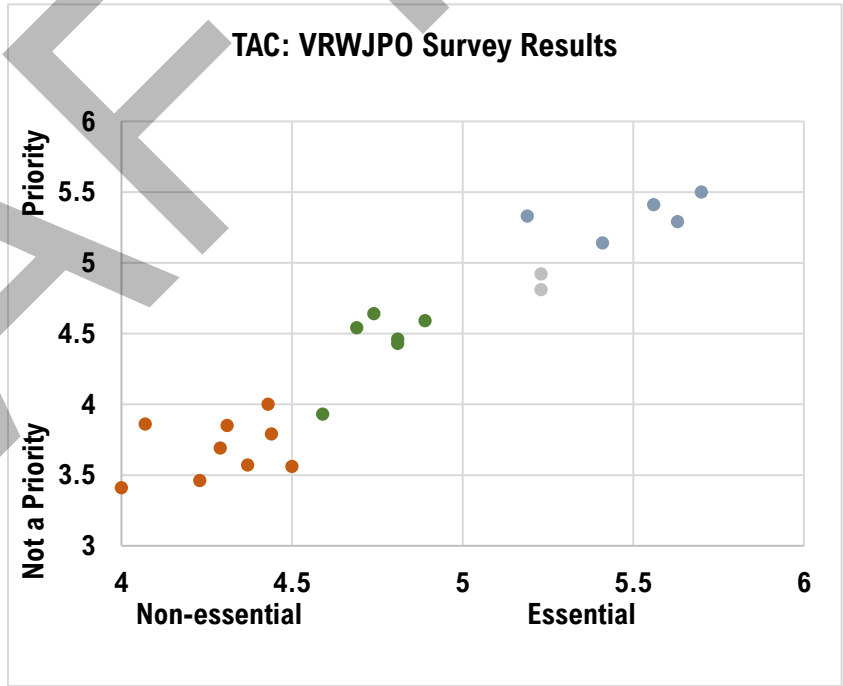
Table C-2: CAC Scoring of Proposed Issues

ISSUE (CAC Ratings)	Relevance	Priority	Average
Continue to evaluate, collaborate, and initiate projects that promote stream stability and natural channel restoration	6	6	6

ISSUE (CAC Ratings)	Relevance	Priority	Average
Monitor effectiveness of JPO's watershed strategies and activities	5.67	5.67	5.67
Continue efforts to evaluate, collaborate, and initiate projects that address nitrogen levels in surface water and groundwater	5.33	5.33	5.33
Continue efforts to evaluate, collaborate, and initiate projects that address phosphorus levels in surface water	5.33	5.33	5.33
Continue to evaluate, collaborate, and initiate projects that mitigate loss and preserve wetlands.	5.33	5.33	5.33
Improve collaboration and monitor effectiveness with LGUs on shared policies/standards, collaboration on beneficial projects, programs, and practices.	5	5.2	5.1
Continue efforts and collaborate on initiatives for chloride reduction (re: smart salting techniques)	5	5	5
Reevaluate floodplains and impacts in flood-prone areas	5	5	5
Develop broader environmental education and engagement using earned and paid media	5	5	5
Review current regulations and make adjustments that are reasonable and enforceable by rural LGUs	5	5	5
Evaluate and collaborate on groundwater sustainability	5	5	5

TAC members also rated each issue on a scale of 3.0 to 6.0 for relevance to the JPO and priority for the next plan update. Combined scores are in the following graph.

Figure C-4: TAC Issue Prioritization Survey Results



Issues receiving a score of 4.5 (the midpoint value) or greater for relevance and priority included:

Table C-3: TAC Scoring of Proposed Issues

ISSUE (TAC Ratings)	Relevance	Priority	Average
Monitor effectiveness of JPO's watershed strategies and activities	5.7	5.5	5.60
Continue to promote effective stormwater management	5.56	5.41	5.49
Continue to evaluate, collaborate, and initiate projects that address phosphorous levels in surface water	5.63	5.29	5.46
Continue to evaluate, collaborate, and initiate projects that promote stream stability and natural channel restoration.	5.41	5.14	5.28
Continue to evaluate, collaborate, and initiate projects that mitigate loss and preserve wetlands.	5.19	5.33	5.26
Improve collaboration and monitor effectiveness with LGU's on shared policies/standards, collaboration on beneficial projects, programs, and practices.	5.23	4.92	5.08
Continue to evaluate, collaborate, and initiate projects that address nitrogen levels in surface water and groundwater.	5.23	4.81	5.02
Collaborate on initiatives that assess water resource impacts from riparian land changes/uses that aren't addressed through existing regulatory requirements to protect and restore soil health.	4.89	4.59	4.74
Continue efforts and collaborate on initiatives for chloride reduction (re: smart salting techniques)	4.74	4.64	4.69
Continue to evaluate, collaborate, and initiate projects that address stormwater reuse.	4.81	4.46	4.64
Review current regulations and make adjustments that are reasonable and enforceable by rural LGUs	4.81	4.43	4.62
Evaluate and collaborate on groundwater sustainability.	4.69	4.54	4.62

Both advisory committees gave similarly high ratings (4.5 or greater, combined) to these issues:

- Projects for stream channel stability and restoration
- Monitoring the effectiveness of VRWJPO's watershed strategies and activities
- Projects to preserve wetlands and mitigate wetland loss
- Addressing nitrogen and phosphorus levels
- Promoting effective stormwater management
- Improving collaboration with LGUs
- Initiatives for chloride reduction
- Collaborating on groundwater sustainability
- Ensuring that regulations are enforceable by LGUs

- Stormwater reuse
- Assessing impacts from riparian land use changes
- Re-evaluating floodplains
- Broadening education and engagement with earned and paid media

These results were shared with the JPB at a Strategic Planning Session on March 21, 2024. The Commissioners provided direction for how to focus efforts in the Plan:

- Determine which actions have the most impact. The lowest-hanging fruit projects have been completed, so the VRWJPO should determine where the best value is now.
- Staff should place focus on achieving high-quality projects, rather than striving for quantity, and continue coordination and collaboration with local partners for the best outcomes. Implementation actions should reflect this approach.
- The VRWJPO Plan should "edge-match" with other plans, such as county groundwater plans, city capital improvement plans, SWCD comprehensive plans, and land conservation plans, so as not to duplicate work being done elsewhere.
- The Plan should be as simple and clear as possible for communicating to the public and show how their tax dollars make a positive impact.

C-3 Goal and Objective Development and Prioritization

Based on the top themes from stakeholder input and Board direction, VRWJPO staff chose six issue categories to structure the Plan around. Each issue category includes:

- Issue statements that define the overarching problems being faced.
- Goals establish the desired endpoint or results.
- Objectives help organize actions that will lead toward accomplishing desired goals.

The specific actions for each objective are listed in the Implementation Table on pages xx.

To keep the public apprised of efforts following the Strategic Planning Session, a web page (link) was published that included:

- Findings from initial outreach efforts
- A guide to the structure of the Plan
- A roadmap of the next steps in the planning process
- Information about Plan content as it was developed

Prioritization Survey (Survey 3)

To assess and prioritize identified issues and corresponding objectives, staff invited the TAC and CAC to participate in a survey meeting on September 25, 2024, at the Dakota County Extension and Conservation Center. Members were provided the draft issue categories, goals, and objectives before the meeting and were asked to rank objectives to inform Plan prioritization. In addition, staff formulated a list of topics of importance that related to each issue category and asked members of the TAC and CAC to rank them in a prioritization exercise after ranking the objectives.

Ranking schemes were provided to the VRWJPO as participants' answers were entered into a live polling program called Mentimeter. Mentimeter is an online polling service that allows participants to vote from anywhere while the session is live and displays real-time results as votes are submitted. This method created a platform for real-time responses and helped to prompt discussion among those in attendance.

Attendance

Twenty-five people participated in the survey. Most of these participants were in-person attendees, with a small number participating virtually.

Participating organizations included:

- The VRWJPO CAC
- Dakota County Environmental Resources Department
- DCSWCD
- City of Lakeville
- City of Rosemount
- City of Farmington
- Vermillion Township
- DNR
- MDH
- MDA
- BWSR
- MPCA
- MNDOT
- Metropolitan Council
- TCTU
- Minnesota Agriculture & Water Resources Coalition
- Emmons and Olivier Resources
- RES

Aligning TAC-CAC Prioritization with JPB and Staff

Following Survey 3, VRWJPO staff analyzed the collected results. Upon review, it was noted that the Mentimeter platform assigns priority based on a weighted scoring. To ensure the data collected was most representative of the full audience perspective, VRWJPO staff consulted with the Dakota County Office of Performance and Analysis to conduct additional statistical analyses on the prioritization results. This additional lens of review, coupled with staff understanding of VRWJPO roles, resulted in a few minor differences in recommendations from those presented by the Mentimeter survey outcomes.

On December 5, 2024, staff sought direction from the JPB on their priority levels of issue category objectives for inclusion in the Plan. Staff presented the information in a matrix that had a table for each respective issue category, organized with four columns. The columns for each table had the following content:

- Column 1 lists the objectives associated with each issue category
- Column 2 presents TAC and CAC input received during the September 25, 2024, survey meeting
- Column 3 presents staff recommendations based on expertise and statistical analyses
- Column 4 indicates the JPB priority recommendations from the December 5, 2024, meeting

The final matrix for prioritization of issue category objectives can be seen in the tables on pages C-17 through C-22. The prioritization levels are applied to actions included in the Implementation Table in Section 3 of the WMP.

C-4 Local Government Unit Capital Improvement Plan Review

To further edge-match the Watershed Management Plan with other relevant local efforts, staff met with the biggest LGUs in the watershed to learn about their visions for potential partnerships in 2026-2035, including where their priorities would be focused and

how they match with VRWJPO priorities. Partnership ideas included:

- Street sweeping studies
- Stormwater drain and pond improvements
- Agricultural BMPs
- Streambank stabilizations
- Wetland restorations
- Stormwater reuse
- Potential assessments and studies
- Filtration basins
- Hydrodynamic separators
- Reconnecting water bodies to historic floodplains
- Irrigation improvements

Participating LGUs included:

- City of Apple Valley
- City of Burnsville
- City of Empire
- City of Farmington
- City of Hastings
- City of Lakeville
- City of Rosemount
- Dakota County

C-5 Standards Review

As part of the Watershed Management Plan update, staff also found it prudent to update the Watershed Standards, which had not been updated since 2019.

Proposed revisions to the VRWJPO Standards, planned for inclusion in the Plan, were drafted following input received during prioritization surveys. Feedback from the stakeholder survey suggested that any regulations and criteria that are overly complicated, are not enforceable by the VRWJPO, and are not pertinent to engineering design should be removed from the Standards.

In response, VRWJPO staff drafted revisions to the Standards to the extent feasible for review and approval by the TAC. On March 13, 2025, VRWJPO staff met with the TAC to discuss the proposed revisions. Their input was incorporated into the final draft version of the revised Standards (attached Appendix A) with changes detailed as follows:

Sections 1-9:

- Text not related to engineering design has been removed.
- Minor text updates related to engineering design have been added or revised for clarification.
- Duplicative criteria that are already in other LGU or MPCA ordinances/standards have been removed.

Section 5: Wetland Alteration Standards

- Wetland banking criteria have been modified to align with VRWJPO administration policies.

Section 6: Buffer Standards

- Wetland Functional Assessment rules have been removed and replaced with language consistent with state wetland functional assessment protocols. Figure D-1 may be revised from time to time throughout the life of the Plan, depending on changing trout stream designations that the DNR regulates.

- The “Exceptions” text has been moved to either “Regulation” or “Criteria”.

Section 7: Erosion and Sediment Control Standards

- Land disturbing activities will be permitted through the MPCA (or LGU with an MS4 permit) since unincorporated areas (other than Eureka Township, where the VRWJPO currently issues permits) are challenged to implement or follow VRWJPO Standards for projects that will disturb less than one acre of land. The Standards are also consistent with those of the North Cannon River WMO, which some townships in the VRWJPO are also tributary to.
- Removed section titled “Exceptions”.

Section 8: Stormwater Management Standards

- Text has been reorganized to follow a typical engineering design workflow:
- Volume Control
- Rate Control
- Post-Construction Water Quality Criteria
- Removed sections on waivers, trading, and exceptions.

Section 10: Agricultural Standards

- Removed Section. Most routine ongoing agricultural activities are exempt from permitting under the Clean Water Act, and voluntary stewardship programs are managed through other organizations like SWCDs.

C-6 Draft Plan Comment Period

Staff got approval from the JPB to submit the draft Plan for the required 60-day review and comment period for the two counties, Metropolitan Council, state review agencies, SWCDs, all cities in the watershed, and all townships in the watershed. Dakota County reviewed the draft Plan for consistency with the County’s Groundwater Plan. The 60-day comment period took place from August to October 2025.

VRWJPO responded to stakeholder comments and hosted a public hearing on the draft Plan following the 60-day review and comment period.

Issue Category Information

Water quality has been a primary driver of work in the Vermillion River Watershed since the VRWJPO's inception. For this generation Watershed Management Plan (Plan), water quality encompasses both surficial and groundwater sources. Issue Statements can be found below.

- Surface water quality is threatened or impaired.
- Groundwater quality is threatened or impaired.

Water Quality Objectives	*CAC-TAC Input*	*Staff Recommendations* *(Based on Expertise & Statistical Analyses)*	*Board Recommendations*
Protect surface waters from impairments	High Priority	High Priority	High Priority
Support and implement projects, programs and practices to protect or improve groundwater quality	High Priority	Medium Priority	Medium Priority
Use surface water quality monitoring data to inform restoration and protection decisions	Medium Priority	High Priority	High Priority
Remove surface waters from the impaired waters list	Medium Priority	High Priority	High Priority
Coordinate with others to assess impacts to groundwater from the Vermillion River and its tributaries	Low Priority	Medium Priority	Medium Priority
Assist and coordinate groundwater quality work with lead groundwater organizations	Low Priority	Low Priority	Low Priority

Issue Category Information

The Plan is structured to address management of stormwater runoff through implementation actions that: promote conservation of features that naturally attenuate stormwater, expand on built practices that have the ability to improve stormwater quality and quantity, and capture and reuse stormwater where feasible. Issue Statements can be found below.

- Land alterations and lack of adequate stormwater management in the Watershed have increased the rate and volume of stormwater runoff, impacted water quality, degraded habitat and increased flood risk.
- Watershed Rules and Standards are challenging for some local government units to enforce.

Stormwater Management Objectives	*CAC-TAC Input*	*Staff Recommendations* *(Based on Expertise & Statistical Analyses)*	*Board Recommendations*
Promote and implement stormwater practices that manage the peak rate and volume of runoff from the landscape	High Priority	High Priority	High Priority
Promote and implement infiltration practices	High Priority	High Priority	High Priority
Assist in the development and implementation of policies and programs that promote green infrastructure and low impact development practices	Medium Priority	Medium Priority	Medium Priority
Promote protection of natural floodplain capacities	Medium Priority	Medium Priority	Medium Priority
Collaborate with technical experts and local governments when updating, revising, or changing watershed rules and standards	Medium Priority	Medium Priority	Medium Priority
Ensure watershed rules and standards can be administered by local governments	Low Priority	Low Priority	Low Priority
Assist local governments with navigating and understanding regulatory frameworks	Low Priority	Low Priority	Low Priority

Issue Category Information

While the VRWJPO is not a governing body for groundwater supply, impacts have implications for local water resources and Watershed communities. For this reason, the Plan incorporates groundwater supply implementation actions that: assist with groundwater conservation initiatives and lean on the expertise of groundwater supply leading agencies. Issue Statements can be found below:

- Groundwater aquifer supply is threatened due to increased and competing uses.
- Groundwater recharge rates are decreasing due to landscape alterations and climatic fluctuations.

Groundwater Supply Objectives	*CAC-TAC Input*	*Staff Recommendations* *(Based on Expertise & Statistical Analyses)*	*Board Recommendations*
Assist with and coordinate groundwater supply planning, protection, and improvement efforts with lead groundwater organizations	High Priority	High Priority	High Priority
Assist with and implement projects, programs and practices that reduce landscape and agricultural water use	Medium Priority	Medium Priority	Medium Priority
Assist with and implement projects programs and practices that promote infiltration	Low Priority	Low Priority	Low Priority

Climate Resilience

Issue Category Information

While the Watershed does not have a role in minimizing greenhouse gas reductions, water planning entities and local communities are tasked with fostering resilience on the build and natural landscapes. The Plan achieves this through implementation actions that: support engineering best practices for the built environment, improve historic infrastructure to account for climate deviations and promote resilience in the natural environment. Issue Statements can be found below.

- Climatic patterns are negatively impacting the Watershed's natural and built environment.
- Historic stormwater infrastructure is not adequate to manage climate patterns.

Climate Resilience Objectives	*CAC-TAC Input*	*Staff Recommendations* *(Based on Expertise & Statistical Analyses)*	*Board Recommendations*
Foster partnerships to implement projects, programs and practices that improve stormwater infrastructure's resilience to climate impacts	High Priority	High Priority	High Priority
Support LGUs in stormwater infrastructure adaption	High Priority	Low Priority	Low Priority
Foster partnerships to implement projects, programs, and practices to increase the amount of green infrastructure	Medium Priority	Medium Priority	Medium Priority
Support re-evaluation of watershed floodplains using updated data	Medium Priority	Medium Priority	Medium Priority
Promote reconnection to historic floodplains	Low Priority	High Priority	Medium Priority

Issue Category Information

The Watershed Management Plan supports Watershed growth in an environmentally responsible manner through implementation actions that: support native biodiversity, protect and improve local habitats and minimize impacts to local ecosystems. The Issue Statement relating to this category can be found below.

- Human-caused ecosystem disruptions decrease biological diversity, promote the proliferation of invasive species and have wide-reaching impacts to the Watershed's natural environment.

Natural Environments Objectives	*CAC-TAC Input*	*Staff Recommendations (Based on Expertise & Statistical Analyses)*	*Board Recommendations*
Coordinate with others to implement projects, programs and practices that protect the watershed's aquatic and riparian habitats	High Priority	High Priority	High Priority
Identify and improve high-priority water resource environments found to be significantly impacted by humans	High Priority	High Priority	High Priority
Coordinate with others to implement projects, programs, and practices that improve soil health	Medium Priority	Medium Priority	Medium Priority
Coordinate with others to implement projects, programs and practices that improve disturbed landscapes	Low Priority	Low Priority	Low Priority

Community Relationships

Issue Category Information

Establishing and nurturing relationships with individuals that live, work and play within the Watershed is essential for our success. The Plan will foster the longevity of meaningful community relationships through implementation actions that: articulate the impact local communities have on local water resources and natural environments; promote the engagement of individuals and groups in implementation of environmental stewardship projects, programs, and practices; and increase the understanding of the Watershed's role in various environmental realms. Issue Statements can be found below.

- Public awareness and understanding of the Watershed is limited.
- Community members in the Watershed lack awareness of opportunities to engage in the VRWJPO's work.

Community Relationships Objectives	*CAC-TAC Input*	*Staff Recommendations* *(Based on Expertise & Statistical Analyses)*	*Board Recommendations*
Create and support opportunities for stakeholder connection and engagement with the watershed's natural resources	High Priority	High Priority	High Priority
Consistently communicate and promote the work of the VRWJPO with partners and stakeholders	High Priority	High Priority	High Priority
Communicate with stakeholders regarding the environmental issues that directly impact the watershed	High Priority	High Priority	High Priority
Engage citizens to promote sustainable stewardship of lakes and streams	Medium Priority	Medium Priority	Medium Priority
Grow the amount of watershed stakeholders	Medium Priority	Medium Priority	Medium Priority
Maintain or increase ways for stakeholders to provide relevant input to the VRWJPO	Low Priority	Low Priority	Low Priority

Appendix D: Standards for the Vermillion River Watershed Joint Powers Organization

Forward

The following document presents the Standards for the Vermillion River Watershed Joint Powers Organization (VRWJPO).

Table of Contents

Last Updated: June 26, 2025

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Section 1: Policy Statement

The Vermillion River Watershed Joint Powers Organization (VRWJPO) is a watershed management organization as defined in the Metropolitan Surface Water Management Act (Minn. Statutes Chapter 103B). This Act provides the VRWJPO with the authority to accomplish its statutory purpose – to protect, preserve and manage surface and groundwater systems within the Vermillion River Watershed (Watershed).

The VRWJPO has adopted a Watershed Management Plan (Plan) pursuant to the Act and Minn. Rules Chapter 8410. As defined by Minn. Rules 8410.0105, the Plan must incorporate controls or performance standards relating to, at minimum, wetland management, management of stormwater runoff, flooding impacts, and a classification system for the management of waterbodies.

The Plan provides the management goals, objectives, and actions that the VRWJPO will use to protect, improve, preserve, and manage water resources in the Watershed, and the need and reasonableness for standards, rules, and ordinances to enforce the goals, objectives, and actions of the plan. Many of these Standards are intended to mitigate the potential for impacts to water resources in the Watershed from land development and other actions, essentially acting as a tool to protect, preserve, and manage water resources. In this way, the following Standards implement the plan's goals, objectives, and actions.

Watershed studies have documented streambank erosion where changes in land use and land management throughout the watershed have resulted in increased flow volume, intensity, and duration, combined with poor quality riparian vegetation, leading to bank instability. Unstable stream channels can depress land values, damage property, and endanger high value structures. Accelerated streambank erosion can also increase the rate and severity of stream channel migration and which could result in property loss. In addition, unstable channels undermine bridges, clog culverts, and can otherwise damage infrastructure, requiring costly repairs and ensuring legal issues for both public agencies and private individuals.

A number of sensitive habitats and communities exist in the watershed, including designated trout streams, natural communities, rare and endangered species, and wetlands. Trout and their habitats may be threatened by development without appropriate stormwater management or appropriate land management on agricultural lands. Other sensitive resources, such as natural communities, rare species, and wetlands, have been depleted or have been altered throughout the Watershed. This has increased the value of remaining natural communities and resources. Wetlands can be impacted directly by development and land disturbing activities, and indirectly by hydrologic and water quality changes that are sometimes associated with development and other land disturbing activities. Wetlands provide a variety of functions and values, which are important to the overall character and function of the Watershed.

Cities and residents throughout the Watershed derive their drinking water from groundwater. High nitrates have been documented in groundwater and wells in the eastern portions of the Watershed. The nitrates have largely been linked to agricultural activities. Future

activities without better management or adequate controls may further impact groundwater quality. Impacts to groundwater and water resources from agricultural resources are no longer addressed by these Standards, as the previous version of the Standards (2016) did not provide any tools for regulation or enforcement. The VRWJPO intends to work with partner agencies that are regulating agricultural activities to avoid overlapping requirements and work with partner agencies on proactive projects to improve land management and stewardship.

These Standards address the issues identified in the Plan to protect the public health, safety, welfare and natural resources of the VRWJPO by regulating the improvement or alteration of land and waters within the Watershed to reduce the severity and frequency of high water, to preserve floodplain and wetland storage capacity, to improve the chemical and physical quality of surface waters, to reduce sedimentation, to preserve the hydraulic and navigational capacities of waterbodies, to preserve and protect channels and drainageways, to promote and preserve natural infiltration areas, protect groundwater, and to preserve natural shoreline features. In addition to protecting natural resources, these Standards are intended to minimize future public expenditures and liability on issues caused by the improvement or alteration of land and waters.

Section 2: Relationship with Local Government Units

The VRWJPO recognizes that the control and determination of appropriate land use is the responsibility of the Local Governmental Units (LGUs; i.e., cities, townships, and counties). The VRWJPO can adopt Rules consistent with these Standards in the event it acquires the authority of a watershed district under Minn. Stat. § 103B.211, Subd. 1(a)(3).

LGUs are responsible for adopting Local Water Plans (LWPs) and Ordinances that implement the Plan. Pursuant to Minn. Stat. § 103B.235, The Vermillion River Watershed Joint Powers Board must approve LWP's. The standards in the LWP's must meet or exceed the VRWJPO's Standards and must implement the Standards. LGUs may elect to adopt the VRWJPO Plan by reference, though this option still requires creation of a local ordinance to meet these Standards.

In Dakota County, the cities are the LGUs within their corporate limits. The Townships are the planning and zoning authority in the unincorporated areas in Dakota County. Dakota County maintains permitting authority over development impacting Shoreland and Floodplain and may be the permitting authority for Individual Sewage Treatment Systems (depending on the Township or location within Shoreland and Floodplain). In Scott County, the County is the planning and zoning authority in addition to maintaining permitting authority over Shorelands and Floodplain and Individual Sewage Treatment Systems in unincorporated areas. Thus, in the Scott County portions of the Watershed, cities are the LGUs in incorporated areas and Scott County is the LGU in unincorporated areas.

The VRWJPO will evaluate local government official controls to determine if they match the VRWJPO Standards. If a local government's official controls are found to be insufficient (i.e., do not meet the VRWJPO Standards), the VRWJPO will implement a permitting program in that community.

If an LGU incorporates the VRWJPO Standards into its official controls, and demonstrates compliance with the VRWJPO Standards, that LGU will be responsible for permitting activities. The VRWJPO will require LGUs responsible for permitting to submit some proposed plans to the VRWJPO for review and comment on an as-needed basis. LGUs may also request assistance from the VRWJPO with the review of development plans or clarifications on Standards being implemented through local ordinances. Plans with the following conditions are particularly important to the VRWJPO for review and/or comment:

- Diversions which negatively affect downstream water courses
- Intercommunity flows (upon request from adjoining communities)
- Project site size of 40 acres or more
- Projects that are adjacent to or appear to impact watercourses or unique natural resources

All land alteration plans that require an amendment to, or a variance from, the adopted local water plan must be submitted to the VRWJPO for review and approval, or denial, as prescribed by Minn. Stat. § 103B.211.

The VRWJPO can enforce these Standards or Rules (if Rules are implemented) as allowed by Minn. Stat. § Chs. 103B and 103D and may evaluate LGU enforcement of Standards at any time. If these evaluations reveal non-compliance with the Standards, the VRWJPO will implement a permitting program for all applicable Standards that fall under the VRWJPO's direct enforcement authority in that community. In the event of implementing a permitting program, the VRWJPO will collect permit fees from applicants to offset the costs of implementing a permitting program.

These Standards present the VRWJPO's interpretation of how the goals, objectives, and actions in the Plan should be translated into Standards. LGUs may adopt more restrictive standards. The VRWJPO recognizes that LGUs have different authorities and different ways of implementing programs that will necessitate variation in language and approaches from those presented in the Standards. However, ordinances and official controls implementing the VRWJPO Standards must ultimately show compliance.

Section 3: Definitions

Unless the context clearly indicates otherwise, the following words and phrases shall have the meanings ascribed to them in this section. Unless specifically defined herein, terms used in these Standards shall have the same definition as provided in Minn. Stat. § Chs. 103B and 103D and Minn. R. Ch. 8410 as may be amended, and if not defined there, shall have common usage meaning. For purposes of these Standards, the words "must" and "shall" are mandatory, and the word "may" is permissive.

Agricultural Activity – The use of land for growing and/or production and wholesale distribution of field crops, livestock, and livestock products to produce income or own use, including but not limited to the following:

1. Field crops, including but not limited to, hemp, wheat, wheatgrass, barley, beans, corn, hay, oats, potatoes, rye, peas, sorghum, and sunflowers
2. Livestock, including but not limited to, dairy and beef cattle, goats, sheep, hogs, horses, poultry, game birds and other animals, including deer, rabbits, elk, alpaca, llama, and mink
3. Livestock products, including but not limited to, milk, butter cheese, eggs, meat, fur, and honey
4. Trees, shrubs, bushes, and plants for wholesale distribution
5. Sod farming
6. Orchards

Agricultural Preserve – A land area created and restricted according to Minn. Stat. § 473H.05 to remain in agricultural use.

Alteration or Alter – When used in conjunction with public waters or wetlands, any activity that will change or diminish the course, current or cross-section of public waters, public waters wetlands, or wetlands.

Bankfull Channel Width – The channel width of a stream, creek, or river at bankfull stage.

Bankfull Stage – The water level in a stream channel, creek, or river where the flow just begins to leave the main channel and enter the connected floodplain.

Base Flood Elevation – The computed elevation to which floodwater is anticipated to rise during a 100-year flood (a flood that has a 1% chance of occurring in any given year). It is determined by the Federal Emergency Management Association (FEMA) and used in floodplain management, insurance, and building regulations to establish safe construction practices.

Best Management Practices or BMPs – Techniques proven to be effective in controlling runoff, erosion and sedimentation, including those documented in the Minnesota Construction Site Erosion and Sediment Control Planning Handbook (BWSR, 1988); Protecting Water Quality

in Urban Areas (MPCA, 2000); the Minnesota Small Sites BMPs Manual (Metropolitan Council, 2001); the Minnesota Stormwater Manual (MPCA 2005); and, other sources as approved by the VRWJPO: as such documents may be amended, revised or supplemented.

BWSR – The Minnesota Board of Water and Soil Resources.

Buffer – An area of natural, minimally maintained, vegetated ground cover abutting or surrounding a watercourse, public waters wetland, or wetland.

Commercial Use Development – The development of property for use as a commercial business or office.

Compensatory Storage – Excavated volume of material below the floodplain elevation required to offset floodplain fill.

Dakota SWCD – The Dakota County Soil and Water Conservation District.

Dead Storage – The volume of space located below the overflow point of a basin, pond or landlocked basin.

Drain or Drainage – Any method for removing or diverting water from water bodies, including excavation of an open ditch, installation of subsurface drainage tile, filling, diking, or pumping.

Erosion – The wearing away of the ground surface as a result of wind, flowing water, ice movement, or land disturbing activities.

Erosion and Sediment Control Plan – A plan of BMPs or equivalent measures designed to control runoff and erosion and to retain or control sediment on land during the period of land-disturbing activities using standards adopted by the jurisdictional authority.

Excavation – The artificial removal of soil or other earth material.

Fill – The process of adding soil, gravel, or other materials to raise the ground level or create a stable foundation. Fill is used to build up low areas, level uneven terrain, or provide a base for construction projects such as roads, building pads, or embankments.

Filtration – A process by which stormwater runoff is captured, temporarily stored, and routed through a filter, vegetated strip, underdrain, or buffer to improve water quality.

Floodplain – Any land area susceptible to being inundated by floodwaters from any source. More specifically, FEMA's Special Flood Hazard Area (SFHA) refers to the area that has a 1% annual chance of flooding (also called the 100-year floodplain). Floodplains are categorized on Flood Insurance Rate Maps (FIRMs), which indicate flood risk and are used for insurance, building regulations, and disaster preparedness.

Floodplain Storage – The volume of space available for flood water volume within the floodplain.

Fragmentation – The breaking up of an organism's habitat into discontinuous components.

Grassed Waterway – A natural or constructed channel that is shaped or graded to required dimensions and established in suitable vegetation for the stable conveyance of runoff.

Green Acres – Real property or real estate that qualifies as agricultural property having agricultural use under the Minnesota Agricultural Property Tax Law, Minn. Stat. § 273.111.

Industrial Use Development – The development of property for industrial use as identified by the Standard Industrial Classification (SIC) codes or the North American Industry Classification System (NAICS code).

Infiltration – A process by which stormwater runoff is captured, temporarily stored, and routed through a filter, vegetated strip, or buffer to improve water quality while reducing the volume of stormwater runoff by transmitting runoff into the ground.

Impervious Surface – A constructed hard surface that either prevents or retards the entry of water into the soil and causes water to run off the surface in greater quantities and at an increased rate of flow than before development. Examples include rooftops, sidewalks, patios, driveways, parking lots, storage areas, and concrete, asphalt, or gravel roads.

Infrastructure – The system of public works for a county, state, or LGU, including, but not limited to, structures, roads, bridges, culverts, sidewalks, stormwater management facilities, conveyance systems and pipes, pump stations, sanitary sewers and interceptors, hydraulic structures, permanent erosion control and stream bank protection measures, water lines, gas lines, or electrical lines and associated facilities, and communication lines and supporting facilities.

Land Disturbing Activity – Any activity on property that results in a change or alteration in the existing ground cover (both vegetative and non-vegetative) and/or the existing soil topography. Land disturbing activities include, but are not limited to, development, redevelopment, demolition, construction, reconstruction, clearing, grading, filling, stockpiling, excavation, and borrow pits. The use of land for new and continuing agricultural activities and routine vegetation management activities shall not constitute a land disturbing activity under these Standards.

Landlocked Basin – A basin that is one acre or more in size and does not have a natural outlet at or below the existing 100-year flood elevation as determined by the 100-year runoff event.

Local Governmental Unit or LGU and/or Jurisdictional Authority – Any federal, state, city, county and township lying in whole or part within the Vermillion River Watershed having the authority to review and approve items related to development, redevelopment, improvement, or modification of the natural landscape.

Lot – A parcel of land designated by metes and bounds, subdividion plats, platted property, or other accepted means and separated from other parcels or portions by said description for the purpose of sale, lease, or separation thereof, as designated by Scott or Dakota County.

Lot of Record – Any lot that legally existed prior to the current adoption date of these Standards.

Meander – A sinuous bend of a river, stream, or creek.

Meander Belt – The area between lines drawn tangential to the extreme limits of fully developed meanders.

Minimum Impact Alignment – The alignment for a proposed road, street, utility, path or access that creates the smallest area of impact to a buffer, watercourse, or floodplain. For activities that cross a buffer, watercourse, or floodplain the minimum impact alignment is one that crosses perpendicular, or near perpendicular, to the longitudinal orientation of the buffer, watercourse, or floodplain as reasonable to serve the intended purpose of the improvement.

MPCA – The Minnesota Pollution Control Agency.

MS4 – A municipal separate storm sewer system (MS4) is a conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, storm drains, etc.) that is also owned or operated by a public entity (which can include cities, townships, counties, military bases, hospitals, prison complexes, highway departments, universities, sewer districts, etc.), designed or used for collecting or conveying stormwater, not a combined sewer, and not part of a publicly owned treatment works.

Native Vegetation – Plant species that are indigenous to Minnesota, or that expand their range into Minnesota without being intentionally or unintentionally introduced by human activity and are classified as native in the Minnesota Plant Database.

Natural Retention or Detention – Retention or detention storage of rainwater and runoff that occurs due to the natural landscape and is not artificially constructed.

New Development – The construction of any public or private improvement project, infrastructure, structure, street or road that creates more than 1 acre of new or additional impervious surface or, the subdivision of land.

Noxious Weeds – Any plant listed as a prohibited or restricted or secondary weed according to the Minnesota Department of Agriculture's Minnesota Noxious Weed List.

NPDES – National Pollutant Discharge Elimination System.

NRCS – United States Department of Agriculture Natural Resources Conservation Service.

Ordinary High Water (OHW) Level – The boundary of water basins, watercourses, public waters, and public waters wetlands pursuant to Minnesota Statues 103G.005, subd. 14.

Outlot – A parcel of land shown on a subdivision plat as an outlot, as designated by Scott or Dakota County, and designated alphanumerically, (for example – Outlot A.). Outlots are used to designate one of the following: Land that is part of the subdivision but is to be subdivided into lots and blocks at a later date; land that is to be used for a specific purpose as designated in a developer's agreement or other agreement between the Local Governmental Unit and the developer; or for a public purpose that may have restricted uses such as a buffer.

Plat – The drawing or map of a subdivision prepared for filing of record pursuant to Minn. Stat. § Ch. 505.

Pre-development Condition – The land use on a site that existed in 2005.

Public Waters Wetland – Any public waters wetland as defined in Minn. Stat. § 103G.005, subd. 15a.

Recreational Use Development – Any development of land for recreational use, including but not limited to, parklands, sporting facilities, golf courses, and other commercial or public facilities designed and used to provide recreational opportunities to the public.

Redevelopment – The rebuilding, repair, or alteration of a structure, land surface, road or street, or facility that creates less than 1 acre of new impervious surface, and disturbs, replaces, or alters more than 1 acre of existing impervious surface.

Right-Of-Way – A strip of land occupied or intended to be occupied by a street, railroad, electric transmission line, oil or gas pipeline, water main, sanitary or storm sewer main, or another special use, and dedicated to public use by the recording of the plat on which such right-of-way is established.

Runoff – Rainfall, snowmelt or irrigation water flowing over the ground surface.

Rural Preserves – Class 2a or 2b property that had been assessed under Minnesota Stat. § 2006, section 273.111, or that is part of an agricultural homestead under Minnesota Stat. § 2006, section 273.13, subdivision 23, paragraph (a).

Scott SWCD – The Scott Soil and Water Conservation District.

Sediment – Soil or other surficial material transported by surface water.

Sedimentation – The process or action of depositing sediment.

Sinuous – The curving patterns of a river, stream, or creek.

Stewardship Plan – A conservation plan completed for agricultural land and activities accepted by the Dakota SWCD, the Scott SWCD, or the VRWJPO.

Stream Type – One of numerous stream types based on morphology defined by Rosgen D., *Applied River Morphology*, 1996.

Stormwater Pollution Prevention Plan or SWPPP – A plan for stormwater discharge that includes erosion prevention measures and sediment controls that, when implemented, will decrease soil erosion on a parcel of land and decrease off-site nonpoint pollution.

Structure – Anything manufactured, constructed, or erected which is normally attached to or positioned on land, including portable structures, earthen structures, water and storage systems, drainage facilities, and parking lots.

Subdivision – The separation of an area, lot, or tract of land under single ownership into two or more parcels, tracts, or lots.

USDA – United States Department of Agriculture.

VRWJPO – Vermillion River Watershed Joint Powers Organization.

Watercourse – Intermittent and perennial streams identified on Map 1 attached to these Standards.

Wetland – Any wetland as defined in Minn. Stat. § 103G.005, subd. 19.

Wetland Conservation Act or WCA – The Minnesota Wetland Conservation Act of 1991, as amended.

Section 4: Floodplain Alteration Standards

Summary Of Purpose and Jurisdiction Guidance

Floodplain alteration involves land disturbing activities and projects that may impact the floodplain, or the area around waterbodies that is inundated during heavy rainfall or snowmelt events. Regulations exist for land disturbing activities and projects in floodplain areas to maintain floodplain storage, to minimize changes to upstream and downstream property and stream reaches, and to protect property and structures.

In Dakota County, cities are the LGUs in the incorporated areas that regulate floodplain activities and must be contacted for appropriate permits. Dakota County administers Shoreland and Floodplain requirements through its Ordinance 50 in the unincorporated townships and must be contacted for appropriate permits for activities within the floodplain. In Scott County, cities are the LGUs for incorporated areas while Scott County requires permits for the unincorporated areas that regulate floodplain activities and must be contacted for appropriate permits. The VRWJPO does not have a direct role in the implementation or oversight of floodplain activities as that is the responsibility of the jurisdictional authority.

4.1 Policy

It is the policy of the VRWJPO to:

- Protect the natural function of the Federal Emergency Management Agency (FEMA)-designated floodplain storage areas from encroachment.
- Maintain storage volumes in FEMA-designated floodplains.
- Require Local Plans to include a provision that restricts construction of new structures in FEMA-designated floodplains.
- Require Local Governments to adopt floodplain ordinances that are consistent with Dakota and Scott County water resources plans and ordinances.
- Require floodplain alterations result in “no net loss” of floodplain storage, including the preservation, restoration, and management of floodplain wetlands.
- Encourage local governments gain compensatory storage above direct replacement for new developments within the floodplain.

4.2 Regulation

No person or political subdivision shall obstruct flood flows, increase flood elevations, fill, excavate, or store materials or equipment below the Base Flood Elevation of any watercourse, public waters, public waters wetland, or other wetland without first obtaining a permit from the appropriate LGU.

4.3 Criteria

Development within the floodplain is regulated by the jurisdictional authority.

Section 5: Wetland Alteration Standards

Summary of Purpose and Jurisdiction Guidance

Wetlands are areas that collect and filter water and are defined by their soils, vegetation, and hydrology (the way water is held by and flows through them). Wetlands are critical resources for storage and treatment of surface water runoff and are extremely valuable to the watershed. LGUs are required to enforce the Wetland Conservation Act (WCA) in Minnesota. As a result, the VRWJPO does not have a direct role in the implementation or oversight of WCA, as that is the direct role of the jurisdictional authority.

In Dakota County, cities and townships are the LGUs for WCA enforcement and require wetland delineations and permit approvals if wetland impacts cannot be avoided. The Dakota SWCD is contracted to do wetland reviews for many of the townships and some cities in Dakota County. In Scott County, cities are the LGUs for incorporated areas, while Scott County reviews delineations and approvals for the unincorporated areas.

5.1 Policy

It is the policy of the VRWJPO to:

- Work to achieve no net loss of wetlands in the Watershed.
- Replace lost wetlands in the same subwatershed whenever possible.
- Provide equal or greater functions and values for lost wetlands at the replacement ratios dictated by the WCA.
- Avoid direct or indirect wetland disturbance per State and Federal requirements and approved local wetland management plans.
- Limit the use of high-quality wetlands for stormwater management where other alternatives exist.
- Avoid fragmentation of natural areas and corridors when feasible and mitigate when unavoidable.

5.2 Regulation

No person or political subdivision shall drain, fill, excavate, or otherwise alter a wetland or public waters wetland without first submitting a wetland application and obtaining approval from the LGU with jurisdiction over the activity.

5.3 Criteria

A. Wetland replacement/mitigation siting must follow the priority order below:
   1. Mitigation within the VRWJPO boundary (on-site if approved by the WCA Jurisdictional Authority)
   2. Mitigation within Dakota or Scott County

3. Within BWSR Wetland Bank Service Area 8
4. Within any other BWSR Wetland Bank Service Area

Section 6: Buffer Standards

Summary of Purpose and Jurisdiction Guidance

Buffers are areas of perennial vegetation surrounding watercourses, public waters wetlands, and wetlands that help protect water resources by limiting erosion and filtering runoff. These VRWJPO Buffer Standards will ensure placement of buffers upon development to protect watercourses and wetlands.

In Dakota County, cities and townships ensure that Buffer Standards are enforced through the platting, subdivision, and permitting process. In Scott County, cities ensure Buffer Standards are enforced through the platting, subdivision, and permitting process, while Scott County ensures buffer standards are enforced for subdivisions in the unincorporated areas.

6.1 Policy

It is the policy of the VRWJPO to:

- Work to establish buffers, acting as filter strips, around every wetland and watercourse based on its management classification.
- Avoid fragmentation of natural areas and corridors when feasible and mitigate when unavoidable.
- Protect wetlands and watercourses from chemical, physical, biological, or hydrological changes to prevent significant adverse impacts.

Based on program evaluation, water quality monitoring, and research, the VRWJPO may, in the future, modify standards to vary by subwatershed or require buffers on lands in addition to developing land to meet water quality management objectives.

6.2 Regulation

For any lot created after March 22, 2007, or the adoption of local ordinances implementing the VRWJPO standards, a buffer shall be maintained around the perimeter of all wetlands, watercourses, and public waters wetlands. Buffer strip establishment shall apply to all lots of the proposed subdivision, regardless of whether or not the watercourse, wetland, or public waters wetland is on a specific lot within a proposed development.

In areas where land use is zoned agricultural with one building eligibility per every quarter of a quarter section (40 acres) of property, the buffer requirement will not be exercised until such time as the land use zoning is changed to an alternate use zoning or a higher density of residential building eligibilities. At that time, the buffer requirement will be fully implemented.

The Buffer Standards do not apply to:

A. Lots created that are enrolled in Green Acres, Rural Preserves, Agricultural Preserves, or similar agricultural or rural preservation programs controlling or limiting the potential for future lot subdivision or development, as part of the subdivision process.
B. A lot of record as of March 22, 2007 until such lot is subdivided.
C. Wetland or public waters wetland with an applicable exemption listed under the WCA, and to those portions of wetlands that will be filled under approved wetland replacement plans per the WCA.
D. To existing outlots that received preliminary plat approval in the two-year period preceding March 22, 2007. Buffer standards in effect at the time of LGU approval of a development agreement shall remain in effect throughout the term of the agreement or for a ten-year period from the date of approval, whichever is less.

6.3 Criteria

A. LGU Comprehensive Wetland Management Plans, which prescribe required buffer widths shall be compliant with standards set by the VRWJPO; applicable ordinances, governing widths, restrictions, allowable uses, and monumentation must meet or exceed the requirements set by the VRWJPO.
B. Where a stream meandering project has been completed, the buffer width shall be established by the LGU.
C. Where acceptable natural vegetation exists in buffer areas, the retention of such vegetation in an undisturbed state is required unless approval to replace such vegetation is received. A buffer has acceptable vegetation if it:

    1. Has a continuous, dense layer of perennial grasses and forbs that has been uncultivated or unbroken for at least 5 consecutive years;
    2. Has an overstory of trees and/or shrubs that has been uncultivated or unbroken for at least 5 consecutive years;
    3. Contains a mixture of the plant communities in 1 and 2 above that has been uncultivated or unbroken for at least 5 years.

D. Buffers shall be staked and protected in the field prior to construction unless the vegetation and the condition of the buffer are considered inadequate by the jurisdictional authority. Existing condition vegetation will be considered unacceptable if:

    1. Physical condition of the buffer tends to channelize the flow of surface water.
    2. Vegetative cover is less than 90%.

E. Where buffer vegetation and conditions are unacceptable, or where approval has been obtained to replant, buffers shall be replanted and maintained according to the following Standards:

1. Buffers shall be planted with a native seed mix approved by the State of Minnesota, with the exception of a one-time planting with an annual nurse or cover crop. Plantings of native forbs and grasses may be substituted for seeding. All substitutions must be approved by the LGU. Groupings/clusters of native trees and shrubs, of species and at densities appropriate to site conditions, can also be planted throughout the buffer area.
2. The seed mix and planting shall be broadcast/installed according to the State of Minnesota specifications. The selected seed mixes and plantings for permanent cover shall be appropriate for the soil site conditions and free of invasive species.
3. Buffer vegetation (both natural and created) shall be protected by erosion and sediment control measures during construction.
4. During the first five full growing seasons, except where the LGU has determined vegetation establishment is acceptable, the owner or applicant must replant buffer vegetation where the vegetative cover is less than 90%. The owner or applicant must assure reseeding/or replanting if the buffer changes at any time through human intervention or activities.

F. The buffer shall be protected under a conservation easement, acceptable to the LGU, or include the buffer in a dedicated outlot as part of platting and subdivision approval, except where the buffer is located in a public transportation right-of-way. Buffers shall also be monumented to clearly designate the boundaries of all new buffers within new residential subdivisions. A monument shall consist of a post and a buffer strip sign approved by the LGU.
G. Alterations, including building, storage, paving, routine mowing, burning, plowing, introduction of noxious vegetation, cutting, dredging, filling, mining, dumping, grazing livestock, agricultural production, yard waste disposal, or fertilizer application are prohibited within any buffer. Periodic mowing or burning, or the use of fertilizers and pesticides for the purpose of managing and maintaining native vegetation is allowed with approval of the LGU. Noxious weeds may be removed and mechanical or spot herbicide treatments may be used to control noxious weeds, but aerial or broadcast spraying is not acceptable. Prohibited alterations would not include plantings that enhance the natural vegetation or selective clearing or pruning of trees or vegetation that are dead, diseased or pose similar hazards, or as otherwise clarified in Criteria F.
H. The following activities shall be permitted within any buffer, and shall not constitute prohibited alterations:

    1. The following activities are allowed within both the minimum and average buffer width areas:

        a. Use and maintenance of an unimproved access strip through the buffer, not more than 10 feet in width, for recreational access to the watercourse or wetland and the exercise of riparian rights.
        b. Structures that exist when the buffer is created.
        c. Placement, maintenance, repair, or replacement of public roads and utility and drainage systems that exist on creation of the buffer or are required to comply with any subdivision approval or building permit obtained from the LGU or county, so long as any adverse impacts of public road, utility, or drainage systems on the function of the buffer have been avoided or minimized to the extent practical.

d. Clearing, grading, and seeding are allowed, if part of an approved Wetland Replacement Plan or approved Stream Restoration Plan.
e. A multipurpose trail through an area protected by conservation easement or in a dedicated outlot, is allowed provided it is designed and constructed to minimize erosion and new impervious surfaces, and maintains an absolute minimum distance of at least fifteen feet as measured from the edge of the trail nearest the water resource to the wetland or public waters wetland edge, the bank of the watercourse, or the meander belt, and averages at least one-half the total VRWJPO identified buffer width. Where needed to cross the watercourse, the minimum impact alignment shall be used. The area between the trail and the water resource must be maintained in perennial vegetation in an undisturbed state excepting regular required maintenance of the buffer. Boardwalks and pedestrian bridges associated with a multipurpose trail must be approved by the LGU.
f. The construction of underground utilities such as water, stormwater, and sanitary sewers and pipelines provided the minimum impact alignment is used, the area is stabilized in accordance with Criteria C above.

2. The following activities are allowed within those portions of the average buffer width that exceed the minimum buffer width:

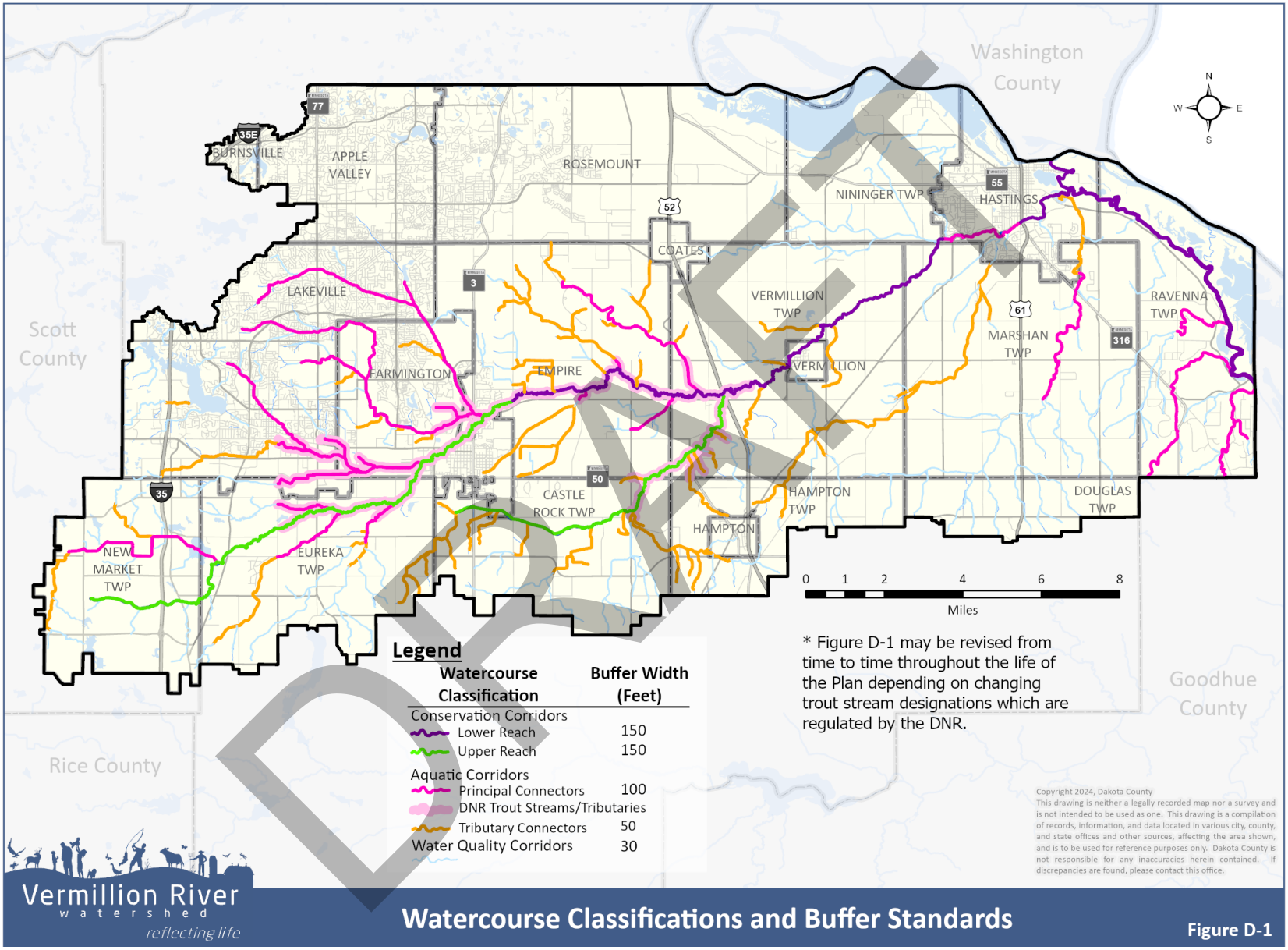
a. Stormwater management facilities, provided the land areas are stabilized in accordance with Criteria C above, and alterations prohibited in Criteria E above are upheld.
b. The area of shallow vegetated infiltration and biofiltration facilities, and water quality ponds not to exceed 50 percent of the pond area, adjacent to wetlands and watercourses may be included in buffer averaging provided the facilities do not encroach into the minimum buffer width, and the land areas are stabilized in accordance with Criteria C above, and alterations prohibited in Criteria E above are upheld.

I. A wetland functional assessment for vegetative diversity, using a functional assessment method approved by the BWSR, will be completed with each wetland and public waters wetland, delineated for a project and buffers established according to the management classification in the following table. LGUs may require more restrictive buffer widths for the protection of jurisdictional wetlands.

Buffer Requirement	Exceptional Quality Wetland (Preserve)	High Quality Wetland (Manage 1)	Medium Quality Wetland (Manage 2)	Low Quality Wetland (Manage 3)
Average Buffer Width	50 feet	40 feet	30 feet	25 feet
Minimum Buffer Width	30 feet	30 feet	25 feet	16.5 feet

J. Watercourse buffers shall be established adjacent to watercourses as shown and classified on Map 1 included in these Standards, and as described for the various classifications below:

Classification	Buffer Width Standard
Conservation Corridor	• Lower Reach (Vermillion River downstream of Biscayne Avenue) – 150-foot average, 100-foot minimum measured from the edge of the meander belt of the river. • Upper Reach (Vermillion River upstream of Biscayne Avenue and South Branch Vermillion River) – 150 foot average, 100-foot minimum measured from the edge of the meander belt of the river. If meander belt isn't present, buffer shall be measured from edge of streambank.
Aquatic Corridor – Principal Connector	• Required buffer width 100-foot average, 65-foot minimum measured from the edge of the meander belt of the river. If meander belt isn't present, buffer shall be measured from edge of streambank.
Aquatic Corridor – Principal Connector with Trout Stream Designation	• 100 foot, no averaging, as required by MN R100001 (NPDES General Construction Permit) issued by the Minnesota Pollutant Control Agency, August 1, 2003 or latest revision.
Aquatic Corridor – Tributary Connector	• 50-foot average, 35-foot minimum measured from the edge of the meander belt of the tributary. If meander belt isn't present, buffer shall be measured from edge of streambank.
Water Quality Corridor	• 30-foot average, 20-foot minimum where there is a flow path for concentrated surface runoff measured from the center line of the flow path.


Washington County
Scott County
Rice County
Goodhue County
BURNSVILLE
APPLE VALLEY
ROSEMOUNT
NININGER TWP
HASTINGS
COATES
LAKEVILLE
VERMILLION TWP
RAVENNA TWP
MARSHAN TWP
VERMILLION
FARMINGTON
EMPIRE
CASTLE ROCK TWP
HAMPTON
HAMPTON TWP
DOUGLAS TWP
NEW MARKET TWP
EUREKA TWP
N
W
E
S
0 1 2 4 6 8
Miles
Legend
Watercourse Classification
Buffer Width (Feet)
Conservation Corridors
Lower Reach 150
Upper Reach 150
Aquatic Corridors
Principal Connectors 100
DNR Trout Streams/Tributaries
Tributary Connectors 50
Water Quality Corridors 30
* Figure D-1 may be revised from time to time throughout the life of the Plan depending on changing trout stream designations which are regulated by the DNR.
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This drawing is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information, and data located in various city, county, and state offices and other sources, affecting the area shown, and is to be used for reference purposes only. Dakota County is not responsible for any inaccuracies herein contained. If discrepancies are found, please contact this office.
DRAFT
Vermillion River watershed reflecting life
Watercourse Classifications and Buffer Standards
Figure D-1

Section 7: Erosion and Sediment Control Standards

Summary of Purpose and Jurisdiction Guidance

Land disturbing activities, like building construction projects, expose soils to rainfall and runoff which can cause erosion of soil and deposition of sediment onto neighboring properties or in waterbodies and watercourses. Erosion and sediment control measures (e.g., a silt fence) keep soil on site during construction and help ensure soil does not permanently wash away.

In Dakota County, cities and townships are generally the LGUs for oversight of erosion and sediment control. Erosion and sediment control requirements are often incorporated into requirements for building, agricultural building, grading, or other local permits. In Scott County, cities are the LGUs for oversight of erosion and sediment control in incorporated areas, while Scott County requires erosion and sediment control measures for the unincorporated areas.

7.1 Policy

It is the policy of the VRWJPO to:

- Minimize the movement of soil within the landscape of the watershed.
- Reduce or mitigate the mechanisms that are the cause of soil movement to the extent practicable.
- Capture soil that does move as close to its point of origination as possible.
- Reduce the delivery of sediment to natural water bodies due to land disturbing activities to the extent practicable.

7.2 Regulation

No person or political subdivision shall commence a land disturbing activity encompassing one acre or more acre of land without first obtaining a land disturbing activity permit consistent with the NPDES General Construction Permit (MNR 100001) requirements.

MS-4 permitted LGU's may have stricter requirements for erosion and sediment control either by election or by other permitting requirements. Local permits must be obtained when required by the LGU. Non-MS-4 permitted LGU's must ensure implementation as required by NPDES.

7.3 Criteria

A. Land disturbing activities encompassing one acre or more acre of land or if a project is part of a common plan of development or sale that ultimately will disturb more than an acre are regulated under the MN R100001 (NPDES General Construction Permit).

B. Jurisdictional authorities must be provided a copy of an NPDES General Construction Permit associated with activities.

Section 8: Stormwater Management Standards

Summary of Purpose and Jurisdiction Guidance

When development and construction projects create new impervious surfaces like roofs and parking lots, they increase the amount of water and the speed of water that can leave the site as runoff. Stormwater management addresses the rate and volume of stormwater leaving sites through long-term practices like stormwater ponds and infiltration basins.

In Dakota County, cities and townships are generally the LGUs responsible for oversight of stormwater management requirements. Stormwater management requirements are often incorporated into requirements for building, agricultural building, grading, or other local permits. In Scott County, cities are the LGUs responsible for oversight of stormwater management in incorporated areas while Scott County ensures stormwater management requirements are met in the unincorporated areas.

8.1 Policy

It is the policy of the VRWJPO to:

- Manage stormwater to minimize erosion.
- Require land disturbing activities to address impacts on water resources, including cumulative impacts.
- Require development plans to consider impacts on local natural resources and corresponding receiving waters.
- Minimize impacts of runoff from land disturbing activities and preserve in-stream conditions supportive of a viable trout fishery by developing stormwater rate and volume control techniques.
- Develop standards that include requirements for controlling stormwater runoff by minimizing impervious surfaces, maximizing infiltration, requirements for cities and townships to control stormwater rates crossing municipal boundaries, and creating stormwater storage that addresses not only peak flows for extreme events, but takes into account the cumulative effects of runoff volume, and will include stormwater rate control requirements.
- Prevent further degradation of waterbodies in the watershed included on the MPCA impaired waters [303(d)] list so that these waterbodies can be removed from the list.
- Encourage use of existing natural retention and detention areas for stormwater management to maintain or improve existing water quality.
- Minimize water quality impacts (including thermal impacts) from land-disturbing activities.
- Ensure stormwater management systems are maintained.

8.2 Regulation

No person or political subdivision shall commence a land disturbing activity for “new development” or “redevelopment” (per Section 3: Definitions) without first obtaining a permit from an LGU.

8.3 Criteria

Stormwater management criteria are presented separately below for Runoff Volume Control, Peak Runoff Rate Control, and Water Quality Criteria.

A. Runoff Volume Control Criteria

1. New development or redevelopment must incorporate volume control practices into the design sufficient to prevent an increase in the runoff volume from the 2-year, 24-hour storm for site conditions prior to development. Determination of the necessary control volume to achieve this Standard is calculated on a site-by-site basis for each activity.
2. Runoff volume reducing practices in site design are the preferred method for meeting volume control requirements and shall be considered prior to the design of the required practices. Practices applying the Minnesota Minimal Impact Design Standards (MIDS) are allowed. Applicants must identify specific practices and provide documentation of the application of the MIDS calculator (or equivalent) in practice selection and site design. Stormwater volume-reducing BMPs other than those identified by MIDS, and their associated credits, must be approved by the LGU. Final crediting must be approved by the LGU before application to final design of site stormwater volume control facility requirements.
3. The water quality control volumes that meet NPDES General Construction Permit criteria using infiltration or filtration technologies can count toward the Volume Control requirements of these Standards.
4. Infiltration volumes and facility sizes shall be calculated using design criteria from the Minnesota Stormwater Manual.
5. Infiltration areas must be protected from disturbance before the land disturbing activity starts.
6. For sites with predominantly Type C and D soils, or where a shallow water table prevents construction of infiltration systems, the following additional criteria must be met in order of decreasing preference:
   a. Minimize connected impervious surfaces to the maximum extent practicable.
   b. Underdrains are used.
   c. Wet ponds are designed for zero discharge for the 2-year, 24-hour storm.
7. Ponds with overflows or outlets located below the seasonally high-water table are allowed only where it can be demonstrated that there is a reasonable need for such an outlet to control seepage damage to existing structures.

B. Peak Runoff Rate Control Criteria

1. A hydrograph method based on sound hydrologic theory will be used to analyze runoff for the design or analysis of flows and water levels.

2. Numerical flow standards must be adopted at intercommunity boundaries as identified in the VRWJPO Hydrologic Model (2009 as amended) for the communities of Burnsville, Apple Valley, Rosemount, Lakeville, Farmington, Hastings, and Elko-New Market. Those communities must apply the VRWJPO Hydrologic Model values in the calibration of their own local hydrologic models.
3. Runoff rates for proposed activities shall apply land cover conditions existing prior to development and shall not exceed existing runoff rates for the 1-year, 10-year, and 100-year 24-hour duration storm event.

C. Water Quality Criteria

1. Post construction stormwater runoff quality measures shall meet the standards of the General Permit Authorization to Discharge Storm Water Associated with Construction Activity under the NPDES General Construction Permit (MNR10001) issued by the Minnesota Pollution Control Agency, August 1, 2023, as amended; except where more specific requirements which are intended to address an increase in runoff temperature:

    a. Infiltration or other volume reduction practices are the preferred approach to minimize any increase in temperature in areas that drain to the trout stream portions of the Vermillion River and its tributaries from the 2-year 24-hour precipitation event where such areas do not first drain to a waterbody with 10 or more acres of open water.
    b. Vegetation used in conjunction with infiltration systems must be tolerant of urban pollutants, and the range of soil moisture conditions anticipated.
    c. Ponds with permanent wet pools are allowed in areas tributary to the trout stream portions of the Vermillion River and its tributaries where such areas do not first drain to a waterbody with 10 or more acres of open water provided no net increase in the temperature of the discharge for the 2-year 24-hour precipitation event.
    d. Plans and reports must include a narrative description of the temperature-sensitive practices incorporated.

8.4 Maintenance

All stormwater management infrastructure shall be maintained in perpetuity to assure function as originally designed. The responsibility for maintenance shall be assumed either by the city, township, or county with jurisdiction over the infrastructure; or by the applicant, their successors, or assigns entering into a maintenance agreement with the LGU.

8.5 Easements

The applicant may be required to establish, in a form acceptable to the LGU, temporary and perpetual easements, or dedicated outlots, for ponding, flowage, and drainage purposes over hydrologic features such as waterbodies and stormwater basins. The easements, or outlots, shall include the right of reasonable access for inspection, monitoring, maintenance, and enforcement purposes.

8.6 Covenants

The LGU may require that the land be subjected to restrictive covenants, a conservation easement, or easement in form acceptable to the LGU, to prevent the future expansion of impervious surfaces and the loss of infiltration capacity.

Section 9: Drainage Alteration Standards

Summary of Purpose and Jurisdiction Guidance

The intent of these drainage alteration standards is to provide a means for permitting significant drainage changes within the watershed that may have negative impacts for water resources.

There is no specific LGU that oversees drainage alteration permits, but LGUs should review proposed drainage alterations as part of subdivision reviews, building permits, grading permits, or other local controls. LGUs should provide land alteration plans to the VRWJPO for projects with proposed drainage alterations and are encouraged to contact the VRWJPO staff for assistance with drainage alteration concerns.

9.1 Policy

It is the policy of the VRWJPO to:

- Use existing natural retention and detention areas for stormwater management to maintain or improve existing water quality.
- Manage stormwater to minimize erosion.
- Allow outlets from landlocked basins, provided such outlets are consistent with State and Federal regulations, and the downstream impacts, floodway elevation impacts, riparian impacts, and habitat impacts of such outlets have been analyzed and no detrimental impacts result.
- Mitigate and reduce the impact of past increase in stormwater discharge on downstream conveyance systems.
- Address known flooding/erosion problems that cross jurisdictional boundaries and address other boundary issues and the diversion/alteration of watershed flows in local water plans.
- Address gully erosion problems in the watershed.
- Maximize upstream floodwater storage.

9.2 Regulation

No person or political subdivision shall artificially drain surface water or obstruct or divert the natural flow of runoff so as to affect a drainage system, or harm the public health, safety, or general welfare of the VRWJPO, without first obtaining authorization from the LGU or the VRWJPO.

9.3 Criteria

A. Outlets from landlocked basins with a tributary drainage area of 100 acres or more will be allowed, provided such outlets are consistent with other portions of these Standards, State and Federal regulations, and the downstream impacts, floodplain elevation impacts, riparian impacts, and habitat impacts of such outlets have been analyzed and no detrimental impacts result. The analysis and determination shall:
   1. Use a hydrograph method based on sound hydrologic theory to analyze runoff for the design or analysis of flows and water levels;
   2. Ensure a hydrologic regime consistent with the Peak Runoff Rate Control Criteria and the Runoff Volume Control Criteria of these Standards;
   3. Ensure the outlet does not create adverse downstream flooding or water quality conditions, or materially affect the stability of downstream watercourses;
   4. Maintain dead storage within the basin to the maximum extent practicable;
   5. Ensure that proposed development tributary to the land-locked basin has incorporated runoff volume control practices to the maximum extent practicable.

B. Artificial drainage, flow obstruction, and diversions involving watercourses, public waters, public waters wetlands, and wetlands with drainage areas of 640 acres or more, will be allowed provided such alterations or diversions are consistent with other portions of these Standards, State and Federal regulations, and the downstream impacts, riparian impacts, floodplain elevation impacts, and habitat impacts of such alterations or diversions have been analyzed and no detrimental impacts result. Proposals for drainage alterations and diversions shall demonstrate that:
   1. There is a reasonable necessity for such drainage alteration or diversion to improve or protect human health and safety, or to improve or protect aquatic resources;
   2. Reasonable considerations have been made and actions taken to avoid unnecessary injury to upstream and downstream land and water resources;
   3. The drainage alteration or diversion is being accomplished by improving and aiding the normal and natural system of drainage according to its natural carrying capacity, or, in the absence of a practicable natural drain, a reasonable and feasible artificial drainage system that does not create adverse impacts is being implemented.

C. Drainage alterations, diversions, and landlocked basin outlets shall be provided with stable outfalls and channels designed to withstand erosion during the 10-year, 24-hour precipitation event.

9.4 Exceptions

A. No authorization shall be required where it is demonstrated that the proposed drainage alteration or diversion does not cause off-site erosion, sedimentation, flooding, or other damage.

B. The LGU may waive the requirements regarding upstream and downstream flooding impacts if the applicant submits easements or other documentation in form acceptable to the LGU demonstrating and recording the consent of the owner of any land burdened by the proposed alteration.