North Dakota 2004 Integrated Section 305(b) Water Quality Assessment Report and Section 303(d) List of Waters Needing Total Maximum Daily Loads

Submitted to EPA
March 31, 2004

Approved
August 17, 2004

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
999 18TH STREET - SUITE 300
DENVER, CO 80202-2466
Phone 800-227-8917
http://www.epa.gov/region08

AUG 2 3

August 17, 2004

Ref: 8EPR-EP

Dennis R. Fewless, Director
Division of Water Quality
North Dakota Department of Health
1200 Missouri Avenue
P.O. Box 5520
Bismarck, ND 58506-5520

Re: Clean Water Act Section 303(d) Total Maximum Daily Load (TMDL) Waterbody List

Dear Mr. Fewless:

Thank you for your submittal of North Dakota's year 2004 Integrated Water Quality Assessment Report dated May 27, 2004. EPA has conducted a complete review of the Clean Water Act Section 303(d) waterbody list and supporting documentation and information included in the integrated report. Based on this review, EPA has determined that North Dakota's 2004 list of water quality limited segments (WQLSs) still requiring TMDLs meets the requirements of Section 303(d) of the Clean Water Act (CWA) and EPA's implementing regulations. Therefore, by this order, EPA hereby APPROVES North Dakota's Section 303(d) list. Please see the enclosure for a description of the statutory and regulatory requirements and a summary of EPA's review of North Dakota's compliance with each requirement.

EPA's approval of North Dakota's Section 303(d) list extends to all waterbodies in category 5 of the list (i.e., Tables VI-1 to VI-4) with the exception of those waters that are within Indian Country, as defined in 18 U.S.C. Section 1151. EPA is taking no action to approve or disapprove the State's list with respect to those waters at this time. EPA, or eligible Indian Tribes, as appropriate, will retain responsibilities under Section 303(d) for those waters.

The public participation process sponsored by the North Dakota Department of Health included publishing display ads in newspapers across the State requesting public input in developing the draft list and requesting water quality data, official public notices on the list availability, use of the North Dakota Department of Health website, and a mailing to many entities asking for both comments and additional data or information on waters. We commend the State for its thorough public participation process.

We wish to inform you that, in accordance with Section 7 of the Endangered Species Act, our office has received concurrence from the U.S. Fish and Wildlife Service for our biological evaluation written to address the approval of the State's year 2004 Section 303(d) waterbody list. In our biological evaluation we assessed the effects of our approval on the threatened, endangered, proposed, and candidate species throughout the State. Our conclusion was that our approval of the State's list would not likely have an adverse effect on the species of concern. Any effect of the list approval was seen as either insignificant or beneficial to the species.

Under current regulations, the next Section 303(d) list is required to be submitted on April 1, 2006. We suggest you stay abreast of EPA TMDL guidance development in the months to come in the event of any changes to that date. Although current regulations require lists to be submitted every 2 years, in April of even years, states may submit Section 303(d) lists more frequently as they deem necessary. All additions, deletions and modifications to the list will require EPA approval.

Again, thank you for the efforts related to the good job of developing the Section 303(d) TMDL waterbody list for the 2004-2006 biennium. If you have questions on any of the above information, feel free to give me, or Vern Berry (303-312-6234) of my staff, a call.

Sincerely,

Max H. Dodson
Assistant Regional Administrator
Office of Ecosystems Protection and
Remediation

Enclosure

North Dakota 2004 Integrated Section 305(b) Water Quality Assessment Report and Section 303(d) List of Waters Needing Total Maximum Daily Loads

John Hoeven, Governor
Terry Dwelle, M.D., State Health Officer

North Dakota Department of Health
Division of Water Quality
1200 Missouri Avenue
P.O. Box 5520
Bismarck, North Dakota 58506-5520

701.328.5210

CONTENTS

TABLES

FIGURES

PART I. EXECUTIVE SUMMARY

The Clean Water Act (CWA) contains several sections that require states to report on the quality of their waters. Section 305(b) (*State Water Quality Assessment Report*) requires a comprehensive biennial report and Section 303(d) requires, from time to time, a list of a state's water quality-limited waters needing total maximum daily loads or TMDLs. The primary purpose of the Section 305(b) *State Water Quality Assessment Report* is to assess and report on the extent to which beneficial uses of the state's rivers, streams, lakes, reservoirs and wetlands are met. Section 305(b) of the Clean Water Act requires states to submit this assessment report every two years; the information presented in this report is for the reporting period of 2002 through 2003. The Section 305(b) report is a summary report that presents information on use impairment and the causes and sources of impaired or threatened uses for the state as a whole. While the Section 305(b) report is considered a summary report, Section 303 and its accompanying regulations (CFR Part 130 Section 7) require each state to list individual waterbodies (i.e., lakes, reservoirs, rivers, streams and wetlands) that are considered water quality limited and that require load allocations, waste load allocations and TMDLs. This list has become known as the "TMDL list" or "Section 303(d) list."

The North Dakota Department of Health (hereafter referred to as the department) currently recognizes 224 lakes and reservoirs for water quality assessment purposes. Of this total, 134 are manmade reservoirs and 90 are natural lakes. All lakes and reservoirs included in this assessment are considered significantly publicly owned. Based on the state's Assessment Database, the 134 reservoirs have an areal surface of 542,868 acres. Reservoirs comprise about 76 percent of North Dakota's total lake/reservoir surface acres. Of these, 480,731 acres or 67 percent of the state's entire lake and reservoir acres are contained within the two mainstem Missouri River reservoirs (Lake Sakakawea and Lake Oahe). The remaining 132 reservoirs share 62,137 acres, with an average surface area of 471 acres. The 90 natural lakes in North Dakota cover 172,051 acres, with approximately 125,000 acres or 73 percent attributed to Devils Lake. The remaining 89 lakes average 523 acres, with half being smaller than 200 acres. There are 54,427 miles of rivers and streams in the state. Estimates of river stream miles in the state are based on the National Hydrography Dataset (NHD).

For purposes of 2004 Section 305(b) reporting and Section 303(d) listing, the U.S. Environmental Protection Agency (EPA) is encouraging states to submit an integrated report and to follow its integrated reporting guidance (EPA, 2001). Key to integrated reporting is an assessment of all of the state's waters and placement of those waters into one of five categories. The categories represent varying levels of water quality standards attainment, ranging from Category 1, where all of a waterbody's designated uses are met, to Category 5, where a pollutant impairs a waterbody and a TMDL is required.

Eighty-four percent (4,277 miles) of the rivers and streams assessed for this report fully support the beneficial use designated as aquatic life. Of the streams assessed as fully supporting aquatic life use, a little over 50 percent (2,156 miles) are considered threatened. In other words, if water quality trends continue, the stream may not fully support its use for aquatic life in the future. The remaining 16 percent of rivers and streams assessed for this report were assessed as not supporting aquatic life use.

Nonpoint source pollution (e.g., siltation/sedimentation and stream habitat loss or degradation) was the primary cause of aquatic life use impairment. Other forms of pollution causing impairment are trace element contamination, flow alteration and oxygen depletion. The primary sources of pollutants affecting aquatic life use in the state are cropland erosion and runoff, animal feeding operations, and poor grazing management. Other sources linked to aquatic life use impairment are point-source discharges, urban runoff, and hydrologic modifications (e.g., upstream impoundments, low-head dams, channelization, flow regulation and diversion, riparian vegetation removal and wetland drainage).

Recreation use was assessed on 6,648 miles of rivers and streams in the state. Recreation use was fully supporting, fully supporting but threatened, and not supporting on 2,794 miles, 2,664 miles, and 1,189 miles, respectively. Fecal coliform bacteria data collected from monitoring stations across the state were the primary indicators of recreation use attainment. For this reason, pathogens (as reflected by fecal coliform bacteria) are the primary cause of recreation use impairment in North Dakota . The primary sources of fecal coliform bacteria contamination are animal feeding operations and riparian area grazing.

Drinking water supply use is classified for 5,483 miles of rivers and streams in the state. Of the 401 miles assessed for this report, only 158 miles (39 percent) were assessed as threatened for drinking water supply use. The primary threats are taste and odor problems.

A total of 4,028 miles of rivers and streams were identified as capable of supporting a sport fishery from which fish could be used for consumption. Based on the EPA fish tissue of 0.3 μg methyl-mercury/gram of fish tissue, only the Red River of the North was assessed as not supporting fish consumption. While there are many potential sources of methyl-mercury, both anthropogenic and natural, to date there have been no specific causes or sources identified for the mercury present in North Dakota fish.

A total of 100 lakes and reservoirs (33 natural lakes and 67 reservoirs), representing 675,917 surface acres, were assessed for this report. The remaining 124 lakes and reservoirs not assessed represent 39,002 acres or only 5.4 percent of the total lake and reservoir acres in the state. Ninety-seven lakes and reservoirs, representing 675,745 acres, were assessed as fully supporting aquatic life use; in other words, they are considered capable of supporting and maintaining a balanced community of aquatic organisms. Of this total, 37 lakes and reservoirs representing 378,760 acres are considered threatened. A threatened assessment means that if water quality and/or watershed trends continue, it is unlikely these lakes will continue to support aquatic life use. If this trend continues, these lakes and reservoirs will begin to experience more frequent algal blooms and fish kills. They will display a shift in trophic status from a mesotrophic or eutrophic condition to a hypereutrophic condition. Only three lakes, totaling 172 acres, were assessed as not supporting aquatic life use. One of the primary causes of aquatic life impairment to the state's lakes and reservoirs is low dissolved oxygen in the water column. Low dissolved oxygen in lakes can occur in summer (referred to as summer kills) but usually occurs in the winter under ice-cover conditions. When fish kills occur, low dissolved oxygen-tolerant fish species (e.g., carp, bullhead and white suckers) will be favored, resulting in a lake dominated by these rough fish species. Pollutants that stimulate the production of organic matter, such as plants and algae, also can cause aquatic life impairment. Two such secondary pollutant causes

are excessive nutrient loading and siltation (Table V-5).

Major sources of nutrient loading to the state's lakes and reservoirs are erosion and runoff from cropland, runoff from animal feeding operations (e.g., concentrated livestock feeding and wintering operations), and hydrologic modifications. Hydrologic modifications - such as wetland drainage, channelization and ditching - increase the runoff and delivery rates to lakes and reservoirs, in effect, increasing the size of a lake's watershed.

Recreation use (e.g., swimming, waterskiing, boating, sailing and sunbathing) was assessed for 675,880 lake and reservoir acres in the state. Of this total, three lakes, representing 5,565 acres, were assessed as not supporting use for recreation. The primary cause of use impairment is excessive nutrient loading, which results in nuisance algal blooms and noxious aquatic plant growth. Sources of nutrients causing algal blooms and weed growth are erosion and runoff from cropland, runoff from animal feeding operations, and hydrologic modifications. Forty-four lakes and reservoirs, totaling 143,997 acres, were assessed as threatened.

Two-hundred and nine lakes and reservoirs, representing 701,189 acres, and 4,028 miles of rivers and streams were assigned the use for fish consumption. Of the three rivers and 15 lakes and reservoirs for which there were sufficient credible methyl-mercury data, only Devils Lake, Lake Sakakawea, the Missouri River (including Lake Oahe) and the Red River were assessed for the integrated report. The remaining lakes and reservoirs and rivers and streams that support a sport fishery were not assessed for this report. Sources of methyl-mercury in fish remain largely unknown. Potential sources of mercury include natural sources, atmospheric deposition, and runoff from cropland containing grain that was treated with a mercury-based fungicide. (Note: The use of these fungicides is now prohibited.)

Four reservoirs (Lake Sakakawea, Homme Dam, Bisbee Dam and Mt. Carmel Reservoir) are currently used either directly or indirectly as municipal drinking water supplies, while two others (Patterson Lake and Renwick Dam) serve as back-up water supplies in the event the primary water supplies fail. Homme Dam, Mt. Carmel Reservoir and Lake Sakakawea were assessed as fully supporting drinking water supply use. Drinking water supply use was not assessed for the remaining lakes and reservoirs.

Section 303(d) of the CWA and its accompanying regulations require each state to list waterbodies (i.e., lakes, reservoirs, rivers, streams, and wetlands) which are considered water quality-limited and require load allocations, waste load allocations and TMDLs. This list has become known as the "TMDL list" or "Section 303(d) list." A waterbody is considered water quality limited when it is known that its water quality does not meet applicable standards or is not expected to meet applicable standards. Waterbodies can be water quality limited due to point-source pollution, nonpoint-source (NPS) pollution, or both.

In considering whether or not applicable water quality standards are being met, the state should consider not only the narrative and numeric criteria set forth in the standards to protect specific uses, but also the classified uses defined for the waterbody and whether the use or uses are fully supported or not supported due to any pollutant source or cause. Where a waterbody is water quality limited, the state is required to determine, in a reasonable time frame, the reduction in

pollutant loading necessary for that waterbody to meet water quality standards, including its beneficial uses. The process by which the pollutant-loading capacity of a waterbody is determined and the load is allocated to point and nonpoint sources is called a total maximum daily load or TMDL. While the term TMDL implies that loading capacity is determined on a daily time scale, TMDLs can range from meeting an instantaneous concentration (i.e., an acute standard) to computing an acceptable annual phosphorus load for a lake or reservoir.

When a state prepares its list of water quality-limited waterbodies, it is required to prioritize waterbodies for TMDL development and to identify those waterbodies that will be targeted for TMDL development within the next two years. Factors to be considered when prioritizing waterbodies for TMDL development include (1) the severity of pollution and the uses that are impaired; (2) the degree of public interest or support for the TMDL, including the likelihood of implementation of the TMDL; (3) recreational, aesthetic and economic importance of the waterbody; (4) the vulnerability or fragility of a particular waterbody as an aquatic habitat, including the presence of threatened or endangered species; (5) immediate programmatic needs, such as wasteload allocations needed for permit decisions or load allocations for Section 319 NPS project implementation plans; and (6) national policies and priorities identified by EPA.

After considering each of the six factors, the state has developed a three-tiered priority ranking. Assessment units (AUs) listed as Priority 1 have been further categorized. Priority 1A are lakes and reservoirs and river and stream segments for which TMDLs are scheduled to be completed and submitted to EPA in the next two years. Priority 1B are lakes and reservoirs and river and stream segments for which TMDL development projects are scheduled to be started in the next two years. The majority of these Priority 1A and 1B AUs were identified as such based largely on their degree of public support and interest and the likelihood of implementation of the TMDL once completed. Priority 2 AUs are those river and stream segments and lakes and reservoirs that are scheduled for completion in the next 10 years. Waterbodies for which fish consumption use is impaired due to methyl-mercury are considered Priority 3.

The 2004 Section 303(3)(d) TMDL list for North Dakota has identified 65 waterbodies or 109 waterbody/pollutant combinations for TMDL completion in the next two years. These Priority 1A waterbodies are AUs for which the monitoring is either completed or near completion. The 2004 TMDL list also has targeted 32 waterbodies or 57 Priority 1B waterbody/pollutant combinations. These are waterbodies for which TMDL monitoring activities are scheduled to start in the next two years. These priority 1A and 1B waterbody/pollutant combinations represent more than 48 percent of all the priority 1A, 1B and 2 waterbody/pollutant combinations on the list. Based on an anticipated TMDL completion schedule of 22 additional waterbody/pollutant combinations per year following 2006, the department expects to complete TMDLs for all 2004 listed Priority 1A, 1B and 2 waters in 10 years. With the continued commitment to adequate TMDL development staffing and with a continuation in the growth of funding for TMDL development projects in the state, the department is confident it will meet its TMDL development schedule.

PART II. INTRODUCTION

The Clean Water Act (CWA) contains several sections that require states to report on the quality of their waters. Section 305(b) (*State Water Quality Assessment Report*) requires a comprehensive biennial report and Section 303(d) requires, from time to time, a list of a state's water quality-limited waters needing total maximum daily loads or TMDLs. In its regulations implementing Section 303(d), the U.S. Environmental Protection Agency (EPA) has defined "time to time" to mean April 1 of every even-numbered year. While due at the same time, states have historically submitted separate reports to EPA under these two sections. However, in a memorandum and guidance provided to the states by EPA on July 21, 2003, EPA suggested that states combine these two reports into one integrated report. The following is a brief summary of the requirements of each reporting section.

A. Section 305(b) Water Quality Assessment Report

The primary purpose of this *State Water Quality Assessment Report* is to assess and report on the extent to which beneficial uses of the state's rivers, streams, lakes, reservoirs and wetlands are met. Section 305(b) of the Clean Water Act requires states to submit this assessment report every two years; the information presented in this report is for the reporting period of 2002 through 2003. The Section 305(b) report is a summary report that presents information on use impairment and the causes and sources of impaired or threatened uses for the state as a whole.

This report is not a trends report, nor should the data or information in this report be used to assess water quality trends. Factors that complicate and prohibit comparisons between reporting years include changes in the number of sites, the quality of data upon which assessment information is based, and changes to the estimated river and stream miles.

B. Section 303(d) TMDL List of Water Quality-limited Waters

While the Section 305(b) report is considered a summary report, Section 303 and its accompanying regulations (CFR Part 130 Section 7) require each state to list individual waterbodies (i.e., lakes, reservoirs, rivers, streams and wetlands) that are considered water quality limited and that require load allocations, waste load allocations and TMDLs. This list has become known as the "TMDL list" or "Section 303(d) list."

A waterbody is considered water quality limited when it is known that its water quality does not or is not expected to meet applicable water quality standards. Waterbodies can be water quality limited due to point sources of pollution, nonpoint sources of pollution, or both.

In considering whether or not applicable water quality standards are being met, the state should consider not only the narrative and numeric criteria set forth in the standards to protect specific uses, but also the classified uses defined for the waterbody and whether the use or uses are fully supported or not supported due to any pollutant source or cause. Therefore, a waterbody could be considered water quality limited when it can be demonstrated that a beneficial use (e.g.,

aquatic life or recreation) is impaired, even when there are no demonstrated exceedances of either the narrative or numeric criteria. In cases where there is a use impairment and no exceedance of the numeric standard, the state should provide information as to the cause of the impairment. Where the specific pollutant (e.g., copper or phosphorus) is unknown, a general cause category (e.g., metals or nutrients) should be included with the waterbody listing.

Section 303(d) of the CWA and accompanying EPA regulations and policy require impaired and threatened waterbodies to be listed, and TMDLs developed, when the source of impairment is a pollutant. Pollution, by federal and state definition, is "any man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water." Based on the definition of a pollutant provided in Section 502(6) of the CWA and in 40 CFR 130.2(d), pollutants would include temperature, ammonia, chlorine, organic compounds, pesticides, trace elements, nutrients, biochemical oxygen demand (BOD), sediment and pathogens. Waterbodies impaired by habitat and flow alteration and the introduction of exotic species would not be included in the Section 303(d) TMDL list, as these impairment categories would be considered pollution and not pollutants. In other words, all pollutants are pollution, but not all pollution is a pollutant.

Where a waterbody is water quality limited, the state is required to determine, in a reasonable time frame, the reduction in pollutant loading necessary for that waterbody to meet water quality standards, including its beneficial uses. The process by which the pollutant loading capacity of a waterbody is determined and the load is allocated to point and nonpoint sources is called a total maximum daily load or TMDL. While the term TMDL implies that loading capacity is determined on a daily time scale, TMDLs can range from meeting an instantaneous concentration (i.e., an acute standard) to computing an acceptable annual phosphorus load for a lake or reservoir.

Section 303(d) requires states to submit their lists of water quality-limited waterbodies "from time to time." Federal regulations have clarified this language; therefore, beginning in 1992 and by April 1 of every even-numbered year thereafter, states are required to submit a revised list of waters needing TMDLs. North Dakota's last TMDL list was due to be submitted to EPA in April 2002.

This Section 303(d) list includes waterbodies not meeting water quality standards, waterbodies needing TMDLs, and waterbodies that have been removed from the 2002 list. Reasons for removing a waterbody from the 2002 list include (1) a TMDL has been completed for the waterbody and approved by EPA; (2) current data and/or information suggests the waterbody is now meeting water quality standards; (3) data and/or information used to list the waterbody as water quality limited has been determined to be insufficient and/or of poor quality; or (4) the assessment was made based on best professional judgement.

PART III. BACKGROUND

A. Atlas

Table III-1. Atlas

Topic	Value
State Population[1]	642,200
State Surface Area (Sq. Miles)	70,700
Total Miles of Rivers and Streams[2]	54,427.35
Total Miles of Rivers and Streams by Stream Class[3]	
Class I, IA, and II Streams	5,482.88
Class III Streams	48,944.47
Total Miles of Rivers and Streams by Basin	
Red River (including Devils Lake)	11,881.26
Souris River	3,645.00
Upper Missouri (Lake Sakakawea)	13,877.43
Lower Missouri (Lake Oahe)	22,271.01
James River	2,752.65
Border Miles of Shared Rivers and Streams[4]	427.03
Total Number of Lakes and Reservoirs[5]	224
Number of Natural Lakes	90
Number of Manmade Reservoirs	134
Total Acres of Lakes and Reservoirs	714,919.01
Acres of Natural Lakes	172,051.20
Acres of Manmade Reservoirs[6]	542,867.81
Acres of Freshwater Wetlands[7]	2,500,000

[1] Based on the 2000 Census

[2] Total miles are based on the National Hydrography Dataset (NHD).

[3] Stream classes are defined in the *Standards of Quality for Waters of the State* (North Dakota Department of Health., 2001). In general, Classes I, IA, and II streams are perennial, while Class III streams are intermittent or ephemeral.

[4] Includes the Bois de Sioux River and the Red River of the North

[5] Number includes only the lakes and reservoirs which are publicly owned and are in the Assessment Database.

[6] Estimates based on surface acreage at full pool elevation.

[7] Estimate provided by Dahl, T.E., *Wetlands - Losses in the United States: 1780's to 1980's*, Washington, D.C., U.S. Fish and Wildlife Service Report to Congress, 1990.

B. Total Waters

The North Dakota Department of Health (hereafter referred to as the department) currently recognizes 224 lakes and reservoirs for water quality assessment purposes. Of this total, 134 are manmade reservoirs and 90 are natural lakes. All lakes and reservoirs included in this assessment are considered significantly publicly owned.

Reservoirs are defined as waterbodies formed as a result of dams or dugouts constructed on natural or manmade drainages. Natural lakes are waterbodies having natural lake basins. A natural lake can be enhanced with outlet control structures, diversions or dredging. Based on the state's Assessment Database, the 134 reservoirs have an areal surface of 542,868 acres. Reservoirs comprise about 76 percent of North Dakota's total lake/reservoir surface acres. Of these, 480,731 acres or 67 percent of the state's entire lake and reservoir acres are contained within the two mainstem Missouri River reservoirs (Lake Sakakawea and Lake Oahe). The remaining 132 reservoirs share 62,137 acres, with an average surface area of 471 acres.

The 90 natural lakes in North Dakota cover 172,051 acres, with approximately 125,000 acres or 73 percent attributed to Devils Lake. The remaining 89 lakes average 523 acres, with half being smaller than 200 acres.

There are 54,427 miles of rivers and streams in the state. Estimates of river stream miles in the state are based on the National Hydrography Dataset (NHD). The NHD is based upon the content of the U.S. Geological Survey (USGS) Digital Line Graph (DLG) hydrography data, integrated with reach-related information from the EPA Reach File Version 3 (RF3). The NHD incorporates the DLG and RF3; it does not replace them.

In this report, the state has been divided into five basins: Red River (including Devils Lake), Souris River, Upper Missouri River (Lake Sakakawea), Lower Missouri River (Lake Oahe) and James River (Figure II-1). The atlas provided in Table II-1 provides a basin-by-basin estimate of total river and stream miles.

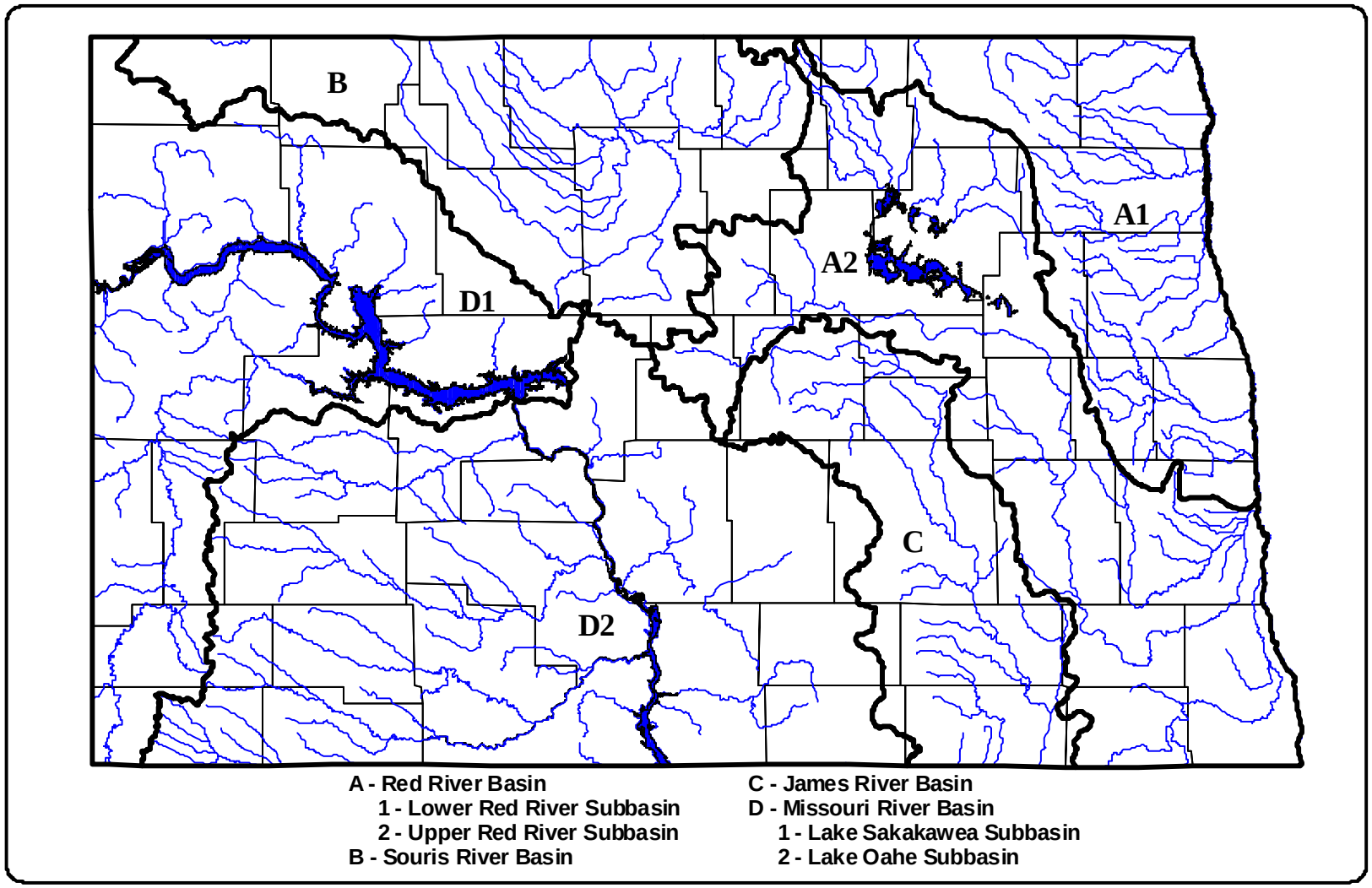

Figure II-1. Major Hydrologic Basins in North Dakota

PART IV. ASSESSMENT METHODOLOGY

A. Introduction

As stated earlier, for purposes of 2004 Section 305(b) reporting and Section 303(d) listing, EPA encouraged states to submit an integrated report and to follow its integrated reporting guidance (EPA, 2001). Key to integrated reporting is an assessment of all of the state's waters and placement of those waters into one of five categories. The categories represent varying levels of water quality standards attainment, ranging from Category 1, where all of a waterbody's designated uses are met, to Category 5, where a pollutant impairs a waterbody and a TMDL is required (Table IV-1). These category determinations are based on consideration of all existing and readily available data and information consistent with the state's assessment methodology. The purpose of this section is to describe the assessment methodology used in this integrated report. This information - which is summarized by specific lake, reservoir, river reach or sub-watershed - is integrated as beneficial use assessments that are entered into a water quality assessment "accounting"/database management system developed by EPA. This system, which provides a standard format for water quality assessment and reporting, is termed the Assessment Database (ADB).

As part of the integrated Section 305(b) and Section 303(d) reporting to EPA, the state also provides a copy of the ADB with the 2004 assessment cycle data. While the Section 303(d) TMDL list in Tables VI-1 through VI-6 provides all Category 5 waterbodies, the listing of all Category 1, 2, 3, 4A, 4B and 4C waterbodies are provided to EPA through the ADB.

B. Assessment Database (ADB)

North Dakota's ADB contains 1,688 discreet assessment units (AUs) representing 54,427 miles of rivers and streams and 224 lakes and reservoirs. Within the ADB, designated uses are defined for each AU (i.e., river or stream reach, lake, reservoir or wetland) based on the state's water quality standards. Each use is then assessed using available chemical, physical and/or biological data.

With an estimated 54,427 miles of rivers and streams and 714,919 acres of lakes, it is impractical to adequately assess each and every mile of stream or every acre of lake. However, the department believes it is important to (1) accurately assess those waters for which beneficial use assessment information is available and (2) account for those stream miles and lake acres that are not assessed or for which there is insufficient data to conduct an assessment. As a result, the department has adopted the ADB to manage water quality assessment information for the state's rivers, streams, lakes and reservoirs.

Developed by EPA, the ADB is an Access® based "accounting"/database management system that provides a standard format for water quality assessment information. It includes a software program for adding and editing assessment data and transferring assessment data between the personal computer and EPA. Assessment data, as compared to raw monitoring data, describes

the overall health or condition of the waterbody by describing beneficial use impairment and, for those waterbodies where beneficial uses are impaired or threatened, the causes and sources of pollution affecting the beneficial use.

Table IV-1. Assessment Categories for the Integrated Report

Assessment Category	Assessment Category Description
Category 1	All of the waterbody's designated uses have been assessed and are met.
Category 2	Some of the waterbody's designated uses are met, but there is insufficient data to determine if remaining designated uses are met.
Category 3	Insufficient data to determine whether any of the waterbody's designated uses are met.
Category 4	The waterbody is impaired or threatened, but a TMDL is not needed. This category has been further sub-categorized as: • 4A - waterbodies that are impaired or threatened, but TMDLs needed to restore beneficial uses have been approved or established by EPA; • 4B - waterbodies that are impaired or threatened, but do not require TMDLs because the state can demonstrate that "other pollution control requirements (e.g., BMPs) required by local, state or federal authority" [see 40 CFR 130.7(b)(1)(iii)] are expected to address all waterbody-pollutant combinations and attain all water quality standards in a reasonable period of time; and • 4C - waterbodies that are impaired or threatened, but the impairment is not due to a pollutant.
Category 5	The waterbody is impaired or threatened for at least one designated use and a TMDL is needed.

To create North Dakota's ADB, the state's 54,427 miles of rivers and streams and 224 lakes and reservoirs have been delineated into 1,688 discreet AUs. An AU can be an individual lake or reservoir, a specific river or stream reach, or a collection of stream reaches in a sub-watershed. North Dakota's ADB is currently represented by 1,464 river and stream AUs and 224 lake and reservoir AUs. Each of these AUs are then assessed individually, based on the availability of sufficient and credible data. In order to delineate and define AUs used in the ADB, the department followed a general set of guidelines:

1. Each AU is within the eight-digit USGS hydrologic unit.

2. Each river and stream AU was composed of stream reaches of the same water quality standards classification (I, IA, II, or III).

3. To the extent practical, each AU is within a contiguous Level IV ecoregion.

4. Mainstem perennial rivers were delineated as separate AUs. Where these rivers join with another major river or stream within the eight-digit hydrologic unit, the river was further delineated into two or more AUs.

5. Tributary rivers and streams, which are named on USGS 1:100,000 scale planimetric maps, were delineated as separate AUs. These AUs may have been further delineated, based on stream order or water quality standards classification.

6. Unnamed ephemeral tributaries to a delineated AU were consolidated into one unique AU. This was done primarily for accounting purposes so that all tributary stream reaches identified in the NHD are included in the ADB.

7. Stream reaches, which were identified in the NHD and on USGS 1:24,000 scale maps and which did not form either an indirect or direct hydrologic connection with a perennial stream, were not included in the ADB. This would include small drainages that originate and flow into closed basin lakes or wetlands. (Note: This delineation criteria does not apply to tributaries to Devils Lake.)

The ADB provides an efficient accounting and data management system. It also allows for the graphical presentation of water quality assessment information by linking assessments contained in the ADB to the NHD file through geographic information systems (GIS). In order to facilitate the GIS datalink, the department has "reach-indexed" each AU in the ADB to the NHD file. The product of this process is a GIS coverage that can be used to graphically display water quality assessment data entered in the ADB. An example can be seen in Figure IV-1, which depicts each of the reach-indexed AUs delineated in the Souris River Basin.

Assessments completed and entered into the ADB also form the basis for the state's Section 319 Nonpoint Source (NPS) Assessment Report and Management Plan. Because of the way the department's Surface Water Quality Management Program is structured, there is complete integration of the state's Section 305(b) Water Quality Assessment Report, the Section 303(d) TMDL List, and the Section 319 NPS Assessment Report and Management Plan.

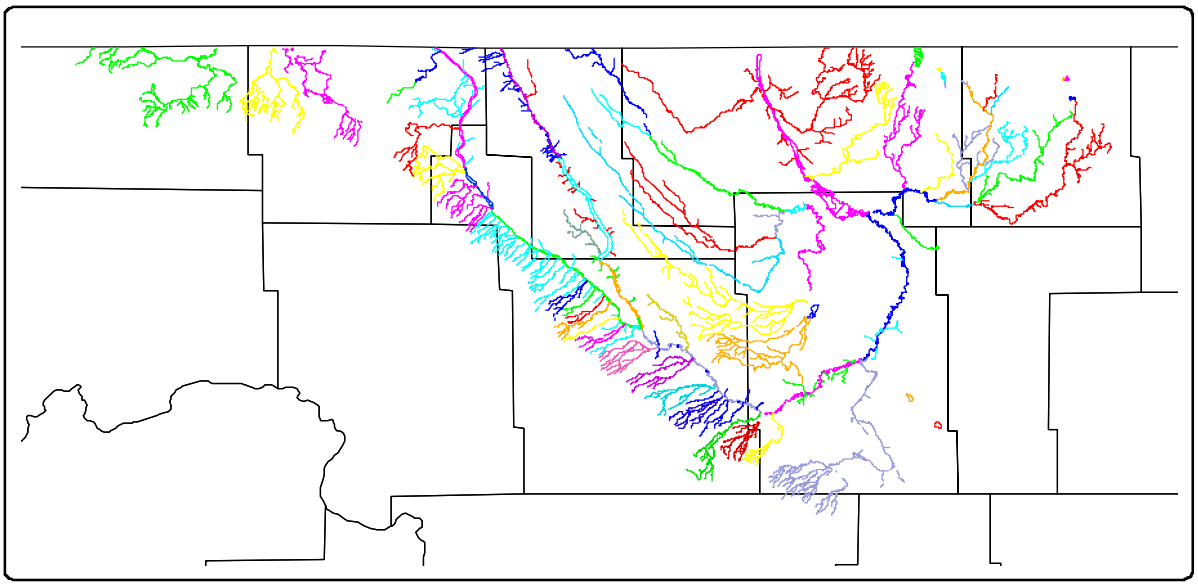

Figure IV-1. Map of Reach-Indexed Assessment Units Delineated in the Souris River Basin

C. Beneficial Use Designation

Water quality reporting requirements under Sections 305(b) and 303(d) of the CWA require states to assess the extent to which their lakes and reservoirs and rivers and streams are meeting water quality standards applicable to their waters, including beneficial uses as defined in their state water quality standards. In addition to beneficial uses, applicable water quality standards also include narrative and numeric standards and antidegradation policies and procedures. While Section 305(b) requires states and tribes to provide only a statewide water quality summary, Section 303(d) takes this reporting a step further by requiring states to identify and list the individual waterbodies that are not meeting applicable water quality standards and to develop TMDLs for those waters. Both Section 305(b) reporting and Section 303(d) listing accomplished this assessment by determining whether the waterbody or AU is supporting its designated beneficial uses.

Beneficial uses are not arbitrarily assigned to AUs, but rather are assigned based on the *Standards of Quality for Waters of the State*. These regulations define the protected beneficial uses of the state's rivers, streams, lakes and reservoirs. Four beneficial uses (aquatic life, recreation, drinking water and fish consumption) were assessed for purposes of Section 305(b)

reporting and Section 303(d) listing.

All waterbodies or AUs entered into the ADB and, therefore, all stream classes (I, IA, II and III) and all lake classes (1-5) are assigned aquatic life and recreation beneficial uses. All Class I, IA and II rivers and streams and all lakes are assigned the drinking water beneficial use.

While not specifically identified in state standards, fish consumption is protected through both narrative and numeric human health criteria specified in the state's water quality standards. Fish consumption has been assigned to all Class I, IA and II rivers and streams, to those Class III streams known to provide a sport fishery, and to all Class 1 through 4 lakes. The state's statewide fish consumption advisory applies to all waters known to provide a sport fishery.

Other beneficial uses identified in the state's water quality standards are agriculture (e.g., stock watering and irrigation) and industrial (e.g., washing and cooling). These uses were not assessed for either the Section 305(b) water quality assessment report or the Section 303(d) TMDL list.

D. Sufficient and Credible Data Requirements

For purposes of Section 305(b) assessment and reporting and 303(d) listing, the department will use only what it considers to be sufficient and credible data. Sufficient and credible data are chemical, physical and biological data that, at a minimum, meet the following criteria:

- Data collection and analysis followed known and documented quality assurance/quality control procedures.

- Water column chemical data were 10 years old or less for rivers and streams and 12 years or less for lakes, unless there was adequate justification to use older data (e.g., land use or climatic conditions have not changed). Fish tissue methyl-mercury data are five years old or less.

- There are a minimum of 10 fish tissue samples per species per lake, reservoir or river representing the range in size classes present in the waterbody.

- There are a minimum of 10 chemical samples or one biological (fish or macroinvertebrate) sample collected in the 10-year period. In the case of chemical samples, the 10 samples may consist of one sample collected in each of the 10 years or 10 samples collected all in one year. **Note: In a few cases, there may be overwhelming evidence to list a waterbody as impaired even though there may be fewer than 10 samples collected within a 10-year period. For example, if only four or five chemical samples were collected within a span of 10 years and all of them exceeded the water quality standard, then the waterbody would be listed as impaired based on this "overwhelming evidence."**

E. Existing and Available Water Quality Data

Chapter 1. River and Streams

Chemical Data

Since 1994, the department has operated a network of 26 to 27 ambient monitoring sites. Where practical, sites are co-located with USGS flow gauging stations, thereby facilitating the analysis of chemical data with stream hydrologic data. All of these sites are established as basin or subbasin integrator sites, where the chemical characteristics measured at each of these sites reflect water quality effects in the entire watershed. It is the department's intention to maintain these as long-term monitoring sites for the purpose of assessing water quality trends and to describe the general chemical character of the state's major river basins.

In 1997, the department began full implementation of its intensive survey approach to chemical monitoring and assessment. The approach complements the ambient water quality monitoring network maintained by the department and other program-monitoring activities (e.g., lake water quality assessments, NPS pollution monitoring and assessment and point-source compliance monitoring). The approach integrates chemical monitoring at targeted sites with biological monitoring at sites throughout the basin. The Souris River Basin, James River Basin and the upper Missouri River Basin were sampled in 1997, 1998 and 1999, respectively.

The department also uses data collected by the USGS. The USGS maintains and operates several water quality monitoring sites that provide data used for assessment purposes. Many of these sites are maintained by the USGS through cooperative agreements with other agencies (e.g., North Dakota State Water Commission, U. S. Bureau of Reclamation and U.S. Army Corps of Engineers), through international agreements (e.g., the Souris River Bilateral Agreement) or with the department itself.

An example of one such project is a cooperative study in the upper Red River Basin. This study, which was initiated in 1997 and concluded in September 1999, was a cooperative study of the USGS, the Minnesota Pollution Control Agency and the department. Objectives of the study were to determine loading contributions from different subbasins of the Upper Red River Basin and to evaluate the effects of constituent concentrations and loads on the aquatic community of the Red River. Physical, chemical and sediment data were collected from 11 sites on the Red River and its tributaries in 1997 and from eight sites in 1998 and 1999.

In addition to the 27-station ambient chemical monitoring network and the intensive basin survey program, the department cooperates with local project sponsors (e.g., soil conservation districts and water resource districts) in small watershed monitoring and assessment projects. The approach of these monitoring and assessment projects is similar to the highly successful Clean Lakes - Phase I Diagnostic/Feasibility Studies. These projects entail intensive water quality monitoring, stream flow measurements, land use assessments and biological assessments. Where lake water quality is a concern, lake monitoring also is included in the sampling and analysis plan. The goal of these small watershed monitoring projects is to estimate pollutant loadings to

the lake or stream and, where appropriate, set target load reductions necessary to improve beneficial uses (e.g., aquatic life and recreation). Most of these projects are followed by Section 319 NPS Pollution Management Program watershed implementation projects. Water quality data collected through these cooperative efforts also are used in assessment of waterbodies for the Section 305(b) report and the TMDL list.

Biological Data

In response to the growing need for better water quality assessment information, the department initiated a biological monitoring program in 1993 and 1994. This program, which was a cooperative effort with the Minnesota Pollution Control Agency and the USGS's Red River National Water Quality Assessment Program, involved approximately 100 sites in the Red River Basin. The result of this initial program was the development of the Index of Biotic Integrity (IBI) for fish in the Red River Basin. The program continued in the Red River Basin in 1995 and 1996. The Upper Red River Basin, including the Sheyenne River and its tributaries, was sampled in 1995, while the Lower Red River Basin was sampled in 1996. Following these initial monitoring efforts in the Red River Basin, biological monitoring was expanded statewide with sampling in the Souris River Basin in 1997, the James River Basin in 1998, the Lake Sakakawea subbasin of the Missouri River Basin in 1999 and the Lake Oahe subbasin of the Missouri River Basin in 2000. Beginning in 1995, biological monitoring was expanded to include macroinvertebrate sampling in addition to fish. For purposes of this integrated report, macroinvertebrate data collected throughout the state (Figure IV-2) were used for assessing aquatic life use, while only fish community data collected in the Red River Basin were used for assessing aquatic life use support.

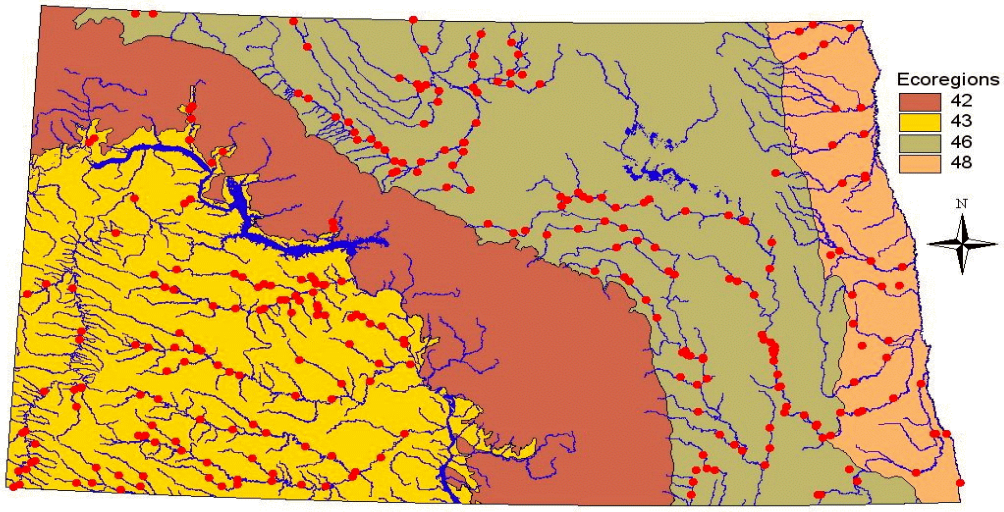

Figure IV-2. Macroinvertebrate Sampling Sites in North Dakota (1995-2000)
(Color-shaded areas are the Level III ecoregions in the state.)

Chapter 2. Lake and Reservoir Data

In 1991, through a grant from the EPA Clean Lakes Program, the department initiated the Lake Water Quality Assessment (LWQA) Project. Since that time, the department has completed sampling and analysis for 111 lakes and reservoirs in the state. The objective of the assessment project is to describe the general physical and chemical condition of the state's lakes and reservoirs.

The lakes and reservoirs targeted for assessment were chosen in conjunction with the North Dakota Game and Fish Department. Criteria used during the selection process were geographic distribution, local and regional significance, fishing and recreational potential, and relative trophic condition. Lakes without much historical monitoring information were given the highest priority.

The results from the LWQA Project have been prepared in a functional atlas-type format. Each lake report discusses the general description of the waterbody, general water quality characteristics, plant and phytoplankton diversity, trophic status estimates, and watershed condition.

One of the most useful measures of lake water quality is trophic condition. Trophic condition is a means of expressing a lake's productivity as compared to other lakes in a district or geographical area. In general, oligotrophic lakes are deep, clear lakes with low primary production, while eutrophic lakes are shallow and contain macrophytes and/or algae. Eutrophic lakes are considered moderately to highly productive.

The trophic condition or status is assessed for each of the lakes and reservoirs included in the LWQA. Accurate trophic status assessments are essential for making sound preservation or improvement recommendations. In order to minimize errors in classification, a multiple indicator approach was initiated.

Since trophic status indices specific to North Dakota waters have not been developed, Carlson's trophic status index (TSI) (Carlson, 1977) was chosen to delineate the trophic status of an LWQA Project lake or reservoir. To create a numerical TSI value, Carlson's TSI uses a mathematical relationship based on three indicators: secchi disk transparency in meters, surface total phosphorus in $\mu g\ L^{-1}$, and chlorophyll-a in $\mu g\ L^{-1}$.

This numerical value then corresponds to a trophic condition ranging from 0 to 100, with increasing values indicating a more eutrophic condition. Carlson's TSI estimates are calculated using the following equations:

- Trophic status based on secchi disk (TSIS):
  TSIS = 60 - 14.41 ln (SD)
  Where SD = Secchi disk transparency in meters.

- Trophic status based on total phosphorus (TSIP):
  TSIP = 14.20 ln (TP) + 4.15
  Where TP = Total phosphorus concentration in μg L^{-1}.

- Trophic status based on chlorophyll-a (TSIC):
  TSIC = 9.81 ln (TC) + 30.60
  Where TC = Chlorophyll-a concentrations in µg L^{-1}.

Trophic status using Carlson's TSI also is depicted graphically in Figure IV-3. A major drawback to using Carlson's TSI is that it was developed for lakes that are primarily phosphorus limited. Because most North Dakota lakes and reservoirs have an abundance of phosphorus, ancillary information (e.g., dissolved oxygen concentrations, frequency of nuisance algal blooms, phytoplankton community structure and macrophyte biomass) was combined with Carlson's numerical TSI to prevent misclassification. Due to variations in geological and ecological regions and lake type (manmade or natural), numerical trophic status assessments were not assigned to waterbodies during the LWQA Project. Instead, the general trophic condition of the waterbody (e.g., mesotrophic, eutrophic or hypereutrophic) is identified.

In addition to the chemical monitoring and analysis, a land-use assessment is completed for each lake assessment. Each lake's watershed is assessed to identify the major sources of point- and nonpoint-source pollution. Land use and land-use practices were inventoried by interviewing local Natural Resources Conservation Service (NRCS) field office staff and state NRCS personnel. This inventory was verified in the field in the late fall. An aerial watershed survey also was performed on approximately one-third of all lakes assessed.

Point-source assessments were accomplished for each watershed with the assistance of the department's National Pollutant Discharge Elimination System (NPDES) Permit Program staff. All contributing point sources were identified, and an estimate was made of the probable nutrient and organic loading to each lake or reservoir and its impact.

Beginning in 1997, LWQA Project activities were integrated into the department's rotating basin monitoring strategy. Lake Darling and the Upper Des Lacs Reservoir were sampled as the department focused its monitoring activities in the Souris River Basin in 1997. Pipestem Dam and Jamestown Reservoir were sampled in 1998; Lake Sakakawea was sampled in 1999; and Bowman-Haley Reservoir, Patterson Lake and Lake Tschida were sampled in 2000.

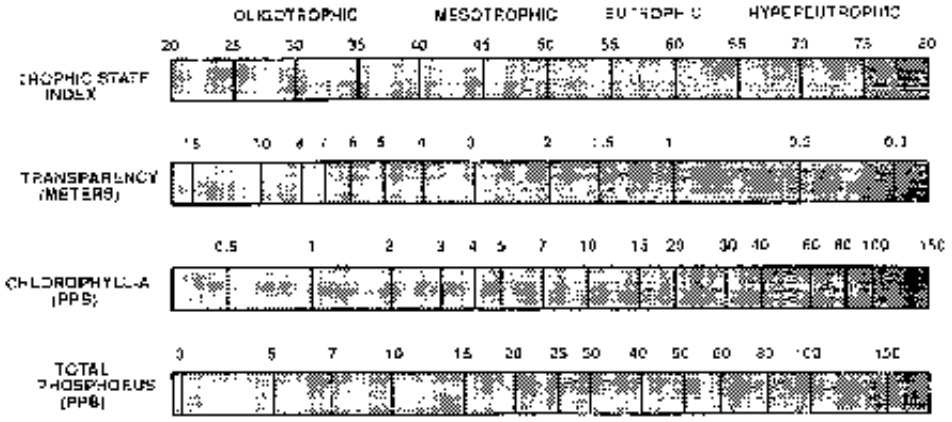

Figure IV-3. A Graphic Representation of Carlson's TSI

In addition to its inclusion in the annual LWQA Project, Devils Lake and Lake Sakakawea have received special attention. Devils Lake has increased in elevation 26 feet since 1993. In response to questions regarding water quality changes resulting from these water level increases, the department initiated a comprehensive water quality monitoring program in 1993 for Devils Lake. Devils Lake is sampled approximately five times per year, including once during the winter.

While Devils Lake has increased in elevation over the last 10 years, Lake Sakakawea's lake level has dropped significantly since 2002. This drop has been due to drought conditions in the upper Missouri River Basin of Montana resulting in reduced runoff and by the U.S. Army Corps of Engineers' operating policies, which favor downstream navigation interests over the health and condition of the upper Missouri River reservoirs. Of particular concern in North Dakota is the quality of Lake Sakakawea's cold water fishery. Since 2002, the department and the North Dakota Game and Fish Department have cooperated in a project to monitor the condition of the lake. Sampling consists of weekly dissolved oxygen (DO)/temperature profiles and water quality samples collected once each month at seven locations.

Chapter 3. Fish Tissue Data

The department has maintained an active fish tissue monitoring and contaminant surveillance program since 1990. As part of this program, individual fish tissue samples are collected from the state's major lakes, reservoirs and rivers and analyzed for methyl-mercury. These data are then used to issue annual species-specific fish advisories for the state's rivers, lakes and reservoirs. Three rivers and 15 lakes and reservoirs met the "sufficient credible data" requirements.

Chapter 4. Other Agency/Organization Data

In addition to the water quality data available through existing department programs and projects and that provided by the USGS, the department also requested data from other agencies and organizations. In a letter dated Nov. 10, 2003, the department requested all readily available and credible data from 23 agencies and organizations believed to have water quality data (Appendix A). In response to this request, the department received additional data from River Keepers and the Minnesota Pollution Control Agency. Others responding to the request had data that were deemed not readily available, or they had data that already had been provided to the department by the USGS.

F. Beneficial Use Assessment Methodology

Chapter 1. Rivers and Streams

The following is a description of the assessment methodology or decision criteria used to assess aquatic life, recreation and drinking water uses where they are assigned to rivers and streams in the state. The methodology used to assess the fish consumption use for both rivers and lakes is provided in section E.3.

All water quality assessments entered into the ADB for Section 305(b) reporting and Section 303(d) TMDL listing are based on "sufficient and credible" monitoring data. Physical and chemical monitoring data used for these assessments included conventional pollutants (e.g., DO, pH, temperature, ammonia and fecal coliform bacteria) and toxic pollutants (e.g., trace elements and pesticides) data collected between 1994 and 2003. Biological monitoring data used for this report included fish community data collected by the department from the Red River Basin between 1993 and 1996 and macroinvertebrate community data collected throughout the state between 1995 and 2000. If more than one site occurred within a delineated AU, data from all sites and for all years was pooled for analysis.

As stated previously, use impairment for the state's rivers and streams was assessed for aquatic life, recreation and drinking water. The following is the beneficial use decision criteria utilized for these assessments.

Aquatic Life

The department uses both chemical and biological data when assessing aquatic life use support for the state's rivers and streams. In some cases, both chemical data and biological data are used to make an assessment determination for an AU. Where both data are available, the department uses a weight-of-evidence approach in making an assessment decision. For example, if there are chemical data that do not show an aquatic life use impairment but the biological data show an impairment to the aquatic community, then the use-support decision will be to list the river or stream AU as "not supporting."

Chemical Assessment Criteria

In general, aquatic life use determinations utilizing chemical data were based on the number of exceedances of the *Standards of Quality for Waters of the State* for DO, pH and temperature and on the number of exceedances of the acute or chronic standards for ammonia, arsenic, cadmium, copper, cyanide, lead, nickel, selenium, silver, zinc and chromium. Where available, dissolved metals data were used to make use support decisions. Where total recoverable metals data were available, the total recoverable value was converted to a dissolved metals value using the recommended conversion factors provided in Table IV-2.

- *Fully Supporting:* For conventional pollutants: the standards of 5 milligrams per liter (mg/L) (minimum) for DO, 7.0 to 9.0 (Class I and IA streams and all lakes) and 6.0 to 9.0 (Class II and III streams) for pH, and 29.4 °C (85 °F) (maximum) for temperature were exceeded in less than 10 percent of the samples collected in the AU. For ammonia and other toxic pollutants (e.g., trace elements and organics): aquatic life is assessed as "fully supporting" if the acute or chronic standard was not violated at any time between 1994 and 2003.

- *Fully Supporting but Threatened:* For DO, pH, and temperature: one or more standards were exceeded in 11 to 25 percent of the measurements taken between 1994 and 2003. For ammonia and other toxic pollutants: the acute or chronic standard was exceeded one or more times, but in less than 10 percent of the samples within any consecutive three-year period between 1994 and 2003.

- *Not Supporting:* For DO, pH, and temperature: one or more standards were exceeded in more than 25 percent of the samples collected between 1994 and 2003. For ammonia and other toxic pollutants, the acute or chronic standard was exceeded in more than 10 percent of the samples collected between 1997 and 2001.

Table IV-2. Recommended Factors for Converting Total Recoverable Metal Criteria to Dissolved Metal Criteria

METAL	RECOMMENDED CONVERSION FACTORS	
	CMC[a]	CCC[a]
Arsenic (III)	1.000	1.000
Cadmium[b]		
Hardness = 50 mg/L	0.973	0.938
Hardness = 100 mg/L	0.944	0.909
Hardness = 200 mg/L	0.915	0.880
Chromium (III)	0.316	0.860[c]
Chromium (VI)	0.982	0.962
Copper	0.960	0.960
Lead[b]		
Hardness = 50 mg/L	0.892	0.892
Hardness = 100 mg/L	0.791	0.791
Hardness = 200 mg/L	0.690	0.690
Nickel	0.998	0.997
Selenium	0.922	0.922
Zinc	0.978	0.986

[a] CMC: Criterion Maximum Concentration
CCC: Criterion Continuous Concentration

[b] The recommended conversion factors (CFs) for any hardness can be calculated using the following equations:

Cadmium
CMC: CF = 1.136672 - [(In hardness) (0.041838)]
CCC: CF = 1.101672 - [(In hardness) (0.041838)]

Lead
CMC and CCC = 1.46203 - [(In hardness) (0.145712)]

where:
(In hardness) = natural logarithm of the hardness. The recommended CFs are given to three decimal places because they are intermediate values in the calculation of dissolved criteria.

[c] This CF applies only if the CCC is based on the test by Stevens and Chapman (1984). If the CCC is based on other chronic tests, it is likely that the CF should be 0.590, 0.376, or the average of these two values.

Source: Stephen, C. E., 1995

Biological Assessment Criteria

Aquatic-life use, or biological integrity, can be defined as "the ability of an aquatic ecosystem to support and maintain a balanced, integrated, adaptive community of organisms having a species composition, diversity and functional organization comparable to that of the natural habitats of the region." (Karr, 1981) When aquatic life is similar to that of natural habitats in the region, termed "reference condition," it is assessed as fully supporting. When it is not similar, it is assessed as either fully supporting but threatened or not supporting, depending upon the degree of impairment. Where biological assessment information or data were available but were inconclusive, aquatic-life use was assessed as having insufficient data.

While chemical data provides an indirect assessment of aquatic life use impairment, direct measures of the biological community are believed to be a more accurate assessment of aquatic-life use or biological integrity. The department began a stream biological monitoring and assessment program in 1993. Since then, fish and macroinvertebrate monitoring has been conducted throughout the entire state.

The department has adopted the "multi-metric" index approach to assess biological integrity or aquatic-life use support for rivers and streams. The multi-metric index approach assumes that various measures of the biological community (e.g., species richness, species composition, trophic structure and individual health) respond to human-induced stressors (e.g., pollutant loadings or habitat alterations). Each measure of the biological community, termed a "metric," is evaluated and scored on either a 1-, 3-, 5-point scale (fish) or on a scale of 0-100 (macroinvertebrates). Using this method, the higher the score, the better the biological condition and, presumably, the lower the pollutant or habitat impact.

Aquatic-life use support assessments based on the fish community were conducted only for the Lake Agassiz Plain Ecoregion, which is a part of the larger Red River of the North Basin. These assessments were based on a multi-metric index of biological integrity (IBI) for fish, which was published in the report entitled *Development of Index of Biotic Integrity Expectations for the Lake Agassiz Plain Ecoregion* (EPA, 1998). This IBI is based on 12 metrics and a 1, 3, 5 scoring criteria similar to Karr et al. (1986). This IBI results in a total possible score of 60. Table IV-3 provides a summary of the IBI scores, the related biological integrity classes (excellent, good, fair, poor and very poor), and the aquatic-life use support criteria (fully supporting, fully supporting but threatened and not supporting) associated with each IBI scoring range.

Table IV-3. Aquatic-Life and Biological Integrity Scoring Criteria for Fish in the Lake Agassiz Plain Ecoregion

Biological Integrity Class	Aquatic-Life Use	Fish IBI Score
Excellent	Fully Supporting	51-60
Good	Fully Supporting	41-50
Fair	Fully Supporting, but Threatened	31-40
Poor	Not Supporting	21-30
Very Poor	Not Supporting	12-20

Aquatic-life use support assessments are based, in part, on three draft stream macroinvertebrate community multimetric IBIs: (1) Northern Glaciated Plains Ecoregion [46], (2) Lake Agassiz Plains Ecoregion [48], and (3) Northwestern Great Plains Ecoregion [43] (North Dakota Department of Health 2004a, North Dakota Department of Health 2004b, and North Dakota Department of Health 2004c). Unlike the metrics used in the fish IBI, metrics used in each IBI for macroinvertebrates were based on metrics scaled from 0-100. The IBI is constructed by computing an average metric score. This results in a maximum possible metric score of 100.

Individual macroinvertebrate IBI scores were computed for a total of 368 sites (Figure IV-2). These results were pooled and the 10^{th} and 75^{th} percentile values computed from the data. These scores were used as the criteria for assigning biological integrity classes and aquatic-life use support assessment categories (Table IV-4). Sites with macroinvertebrate IBI scores greater than 54 are considered to have "good" biological integrity and were assessed as fully supporting aquatic life use. Sites with IBI scores of 21 or less were considered to have "poor" biological integrity and were assessed as not meeting aquatic life use. Sites that scored from 54 to 21 were classified as having "fair" biological integrity. Due to a lack of statistical significance between sites in the good category and the fair category and between sites in the fair category and the poor category, aquatic-life use support assessments in the fair category were not considered to have sufficient data.

While macroinvertebrate data were used to assess sites not previously assessed for aquatic life use, it is important to note that macroinvertebrate scores were not used as rationale to de-list AUs previously listed as impaired based on chemical or physical data.

Table IV-4. Aquatic-Life and Biological Integrity Scoring Criteria for Macroinvertebrates in the Northern Glaciated Plains (46), Lake Agassiz Plain (48) and Northwestern Great Plains (43) Ecoregions of North Dakota

Biological Integrity Class	Aquatic Life Use	Macroinvertebrate IBI Score
Good	Fully Supporting	54 - 100
Fair	Insufficient Data	21 - 53.9
Poor	Not Supporting	0 - 20.9

Recreation

Recreation use includes swimming, boating, wading or any recreational activity that relies on water. Recreation use in rivers and streams is considered fully supporting when there is little or no risk of illness through contact with the water. Recreation use determinations were made using fecal coliform data collected between 1994 and 2003. For each assessment based on fecal coliform data, the following criteria were used:

- Criterion 1: The geometric mean of the samples should not exceed 200 colony-forming units (CFUs) per 100 milliliters (mL).

- Criterion 2: Not more than 10 percent of the samples should have a density exceeding 400 CFUs per 100 mL.

The two criteria were then applied using the following use support decision criteria:

- *Fully Supporting:* Both criteria 1 and 2 are met.
- *Fully Supporting but Threatened:* Criterion 1 is met, but 2 is not.
- *Not Supporting:* Criterion 1 is not met, or Criteria 1 and 2 are not met.

Drinking Water Supply

Drinking water is defined as "waters that are suitable for use as a source of water supply for drinking and culinary purposes, after treatment to a level approved by the department." (*Standards of Quality for Waters of the State*)

Drinking water use was assessed by comparing chemical concentration data to the human health standards for Class I, IA and II rivers and streams. The human health standard for Class I, IA and II rivers and streams considers two means of exposure: (1) ingestion of contaminated aquatic organisms and (2) ingestion of contaminated drinking water. Therefore, any waterbody with contaminant levels exceeding the human health standard would be considered not fully supporting its drinking water use designation.

In order to make beneficial use determinations for drinking water, the following decision criteria were used:

- *Fully Supporting:* For each human health contaminant, greater than 50 percent of the samples had concentrations lower than the water quality standard, and there are no drinking water complaints on record.
- *Fully Supporting but Threatened:* For each contaminant, greater than 50 percent of the samples had concentrations lower than the standard; however, knowledge of taste and odor problems or increased treatment costs have been associated with pollutants.
- *Not Supporting:* For at least one contaminant, greater than 50 percent of the samples exceed the human health standard, and/or frequent taste and odor complaints are on record, or drinking water supply closure is on record within the period 1994 through 2003.

Chapter 2. Lakes and Reservoirs

The following is a description of the assessment methodology or decision criteria used to assess aquatic life, recreation and drinking water uses for lakes and reservoirs in the state. The methodology used to assess the fish consumption use for both rivers and lakes is provided in Section E, Chapter 3.

Aquatic Life and Recreation

The state's narrative water quality standards form the basis for aquatic life and recreation use assessment for Section 305(b) reporting and the Section 303(d) TMDL list. State water quality standards contain narrative criteria that require lakes and reservoirs to be "free from" substances "which are toxic or harmful to humans, animals, plants, or resident aquatic biota" or are "in sufficient amounts to be unsightly or deleterious." Narrative standards also prohibit the "discharge of pollutants" (e.g., nutrients or sediment), "which alone or in combination with other substances, shall impair existing or reasonable beneficial uses of the receiving waters."

Trophic status is the primary indicator used to assess whether a lake or reservoir is meeting the narrative standards. Trophic status is the measure of productivity of a lake or reservoir and is directly related to the level of nutrients (phosphorus and nitrogen) entering the lake or reservoir from its watershed. Highly productive lakes, termed "hypereutrophic," contain excessive phosphorus and are characterized by large growths of weeds, bluegreen algal blooms and low dissolved oxygen concentrations. These lakes experience frequent fish kills and are generally characterized as having excessive rough fish populations (carp, bullhead and sucker) and poor sport fisheries. Due to the frequent algal blooms and excessive weed growth, these lakes are also undesirable for recreational uses such as swimming and boating.

Mesotrophic and eutrophic lakes, on the other hand, have lower phosphorus concentrations, low to moderate levels of aquatic plant growth, and good DO concentrations throughout the year. Mesotrophic lakes do not experience algal blooms, while eutrophic lakes may occasionally experience algal blooms of short duration, typically a few days to a week.

Due to the relationship between trophic status and the aquatic community (as reflected by the fishery) or between trophic status and the frequency of algal blooms, trophic status becomes an effective indicator of aquatic life and recreation use support in lakes and reservoirs. For purposes of this report, it is assumed that hypereutrophic lakes do not fully support a sustainable sport fishery and are limited in recreational uses, whereas mesotrophic lakes fully support both aquatic life and recreation use. Eutrophic lakes may be assessed as fully supporting, fully supporting but threatened, or not supporting their uses for aquatic life or recreation. Eutrophic lakes are further assessed based on (1) information provided by local water resource managers and the public, (2) the knowledge of land use in the lake's watershed, and/or (3) the relative degree of eutrophication.

For example, a eutrophic lake, which has a well-balanced sport fishery and experiences infrequent algal blooms, is assessed as fully supporting. A eutrophic lake, which experiences periodic algal blooms and limited swimming use, would be assessed as not supporting recreation use. A lake fully supporting its aquatic life and/or recreation use, but for which monitoring has

shown a decline in its trophic status (i.e., increasing phosphorus concentrations over time), would be assessed as fully supporting but threatened.

It is recognized that this assessment procedure ignores the fact that, through natural succession, some lakes and reservoirs may display naturally high phosphorus concentrations and experience high productivity. While natural succession or eutrophication can cause high phosphorus concentrations, research suggests that these lakes are typically eutrophic and that lakes classified as hypereutrophic are reflecting external nutrient loading in excess of that occurring naturally.

Drinking Water

All lakes and reservoirs classified in the *State Water Quality Standards*, with the exception of Lake George in Kidder County, are assigned the drinking water beneficial use. While most lakes and reservoirs are assigned this use, few currently are used as a drinking water supply. Lake Sakakawea - the current drinking water supply for the Southwest Water Pipeline and the cities of Garrison, Parshall, Pick City and Riverdale - is assessed as fully supporting. All other lakes and reservoirs assigned the drinking water supply beneficial use were not assessed.

Chapter 3. Fish Consumption Assessment Methodology for Rivers and Lakes

Fish consumption use was assessed based on EPA guidance. To protect people from exposure to methyl-mercury, EPA recommends a fish tissue-based criterion of 0.3 μg methyl-mercury/gram of fish tissue. This criterion is based on national average consumption rates of fish by recreational users, adjusted for exposures due to consumption of commercial fish. To determine whether the fish tissue criterion of 0.3 μg/g has been exceeded in a lake, reservoir or river and therefore assessed as not supporting fish consumption, the average fish tissue concentration, weighted by distribution of consumption, is determined for each species in each lake, reservoir or lake.

The weighted average methyl-mercury concentration for each fish species in each lake or river is calculated by multiplying the average methyl-mercury concentration for fish size range by the relative proportion of that size class in the creel of fisherman catching and keeping fish from that lake or river. Data to estimate the proportion of each size class in the creel of fisherman were obtained from North Dakota Game and Fish Department creel survey reports. The weighted average concentration for each species in each lake or reservoir is then calculated by summing the average concentrations for each size class. Of the three rivers and 15 lakes and reservoirs for which there were sufficient credible methyl-mercury data, only Devils Lake, Lake Sakakawea, the Missouri River (including Lake Oahe) and the Red River were assessed for the integrated report. Creel survey reports were not available for the other lakes and rivers. Weighted average concentrations for each waterbody are presented in Appendices B-E.

PART V. SECTION 305(b) WATER QUALITY ASSESSMENT

A. Rivers and Streams

Chapter 1. Assessment Category Summary

In EPA's guidance for preparing the Integrated Report, the states were encouraged to report on their waters in each of five categories (Table IV-1). In broad terms, the five assessment categories are as follows:

- Category 1: All designated uses are met.
- Category 2: Some designated uses are met, but there is insufficient data to determine if remaining designated uses are met.
- Category 3: There is insufficient data to determine whether any designated uses are met.
- Category 4: Water is impaired or threatened, but a TMDL is not needed for one of three reasons: (a) a TMDL already has been approved for all pollutants causing impairment; (b) the state can demonstrate that "other pollutant control requirements required by local, state or federal authority" are expected to address all waterbody-pollutant combinations and attain all water quality standards in a reasonable period of time; or (c) the impairment or threat is not due to a pollutant.
- Category 5: The waterbody is impaired or threatened for at least one designated use and a TMDL is needed.

The ADB that has been submitted to EPA as part of this Integrated Report provides an assessment category for each lake, reservoir, river or stream AU.

Table V-1 provides a summary of the number of river and stream AUs and total miles of rivers and streams in each category that were assessed for this report. Two AUs, totaling 66 miles, were classified as Category 1, meaning all uses were assessed and fully supporting. Seventy-eight AUs totaling 2,890 miles were assessed as Category 2. These are AUs where at least one designated use was assessed as fully supporting, but the other uses were not assessed. A total of 53 AUs were assessed as Category 4 where at least one designated use was impaired or threatened, but where a TMDL is not required. Of these, 29 AUs do not need TMDLs because TMDLs have already been completed and approved by EPA. The remaining 24 Category 4 AUs do not need a TMDL because the cause of the impairment is not a pollutant. These are typically river and stream reaches where habitat degradation or flow alteration is causing an impairment to aquatic life use. A total of 164 AUs (5,619 miles) were assessed where at least one beneficial use is impaired and a TMDL is required. These Category 5 AUs are provided in a list in Tables VI-1 through VI-4. There were 11,189 river and stream AUs totaling 45,250 miles where there were either no data or insufficient data to assess any of the waterbody's designated uses.

Table V-1. Assessment Category Summary for Rivers and Streams in North Dakota.

Category	Description	Number AUs	Total Size (miles)
1	All uses met	2	66.52
2	Some uses met, others not assessed	79	2,924.47
3	No uses assessed	1,189	45,250.52
4A	Some or all uses impaired or threatened, but a TMDL(s) has been approved for all impaired uses.	28	566.22
4B	Some or all uses impaired or threatened, but other pollutant controls will result in water quality standards attainment.	0	0
4C	Some or all uses impaired or threatened, but impairment is not due to a pollutant.	24	502.07
5	Some or all uses impaired or threatened, and a TMDL is required.	164	5,619.62

Chapter 2. Water Quality Summary

Eighty-four percent (4,277 miles) of the rivers and streams assessed for this report fully support the beneficial use designated as aquatic life (Table V-2). Of the streams assessed as fully supporting aquatic-life use, a little more than 50 percent (2,156 miles) are considered threatened. In other words, if water quality trends continue, the stream may not fully support its use for aquatic life in the future. The remaining 16 percent of rivers and streams assessed for this report were assessed as not supporting aquatic life use (Table V-2).

Table V-2. Individual Use Support Summary for Rivers and Streams in North Dakota (Miles)

Use	Fully Supporting	Fully Supporting, but Threatened	Not Supporting	Not Assessed	Insufficient Information for Assessment	Total Size
Aquatic Life	2,121.07	2,156.19	787.46	44,331.03	5,031.60	54,427.35
Fish Consumption	0	0	399.23	3,628.60	0	4,027.83
Recreation	2,794.52	2,664.00	1,189.30	46,898.65	880.88	54,427.35
Drinking Water Supply	243.25	157.79	0	5,081.84	0	5,482.88

NPS pollution (e.g., siltation/sedimentation and stream habitat loss or degradation) was the primary cause of aquatic life use impairment (Table V-3). Other forms of pollution causing impairment are trace element contamination, flow alteration and oxygen depletion. Organic enrichment creates conditions in the stream that cause dissolved oxygen to be depleted. Rivers and streams impaired by siltation/sedimentation, organic enrichment, eutrophication due to excess nutrients and habitat degradation also will display a degradation in the biological community. Typically, species composition will shift from an aquatic community comprised of intolerant species (e.g., mayflies, caddisflies, stoneflies and darters) to an aquatic community dominated by tolerant species (e.g., midges, carp and bullheads).

Table V-3. Impairment Summary for Rivers and Streams in North Dakota

Impairment	Miles
Total Fecal Coliform	3,853.30
Physical Habitat Alterations	2,514.79
Sedimentation/Siltation	1,970.27
Oxygen Depletion	500.67
Mercury in Fish Tissues	399.23
Biological Indicators	372.44
Flow Alterations	272.04
Total Dissolved Solids	89.28
Nutrients	88.73
Trace Metals in the Water Column	52.63
Ammonia	34.50
Pesticides	21.62
Non-native Aquatic Plants	5.53

The primary sources of pollutants affecting aquatic-life use in the state are cropland erosion and runoff, animal feeding operations, and poor grazing management (Table V-4). Poor grazing management includes riparian grazing and season-long grazing, which result in the deterioration of the plant community or cause a shift in the plant community away from native grass and forbe species to non-native invader species. Evidence of poor grazing practices would include cattle trailing, gully erosion, poor water infiltration rates resulting from soil compaction, and severe streambank erosion. Other sources linked to aquatic-life use impairment are point-source discharges, urban runoff and hydrologic modifications (e.g., upstream impoundments, low-head dams, channelization, flow regulation and diversion, riparian vegetation removal and wetland drainage) (Table V-4).

Recreation use was assessed on 6,648 miles of rivers and streams in the state. Recreation use was fully supporting, fully supporting but threatened, and not supporting on 2,794 miles, 2,664 miles and 1,189 miles, respectively (Table V-2). Fecal coliform bacteria data collected from monitoring stations across the state were the primary indicators of recreation use attainment (see Part IV. Section E. "Beneficial Use Assessment Methodology"). For this reason, pathogens (as reflected by fecal coliform bacteria) are the primary cause of recreation use impairment in North Dakota (Table V-3). Other factors affecting the use of the state's rivers and streams for recreation would be eutrophication from excessive nutrient loading, resulting in nuisance algae and plant growth. The primary sources of fecal coliform bacteria contamination are animal feeding operations and riparian area grazing (Table V-4). Point-source discharges also have been linked to exceedances of the fecal coliform bacteria standard of 200 colonies per 100 mL. These exceedances occur when a municipality discharges from its sanitary sewer directly to the receiving stream, bypassing the wastewater treatment facility. These circumstances generally occurred in the spring when flooding problems cause infiltration to the sanitary sewer.

Drinking water supply use is classified for 5,483 miles of rivers and streams in the state. Of the 401 miles assessed for this report, only 158 miles (39 percent) were assessed as threatened for drinking water supply use (Table V-2). The primary threats are taste and odor problems. While the source of taste and odor has not been specifically identified, potential sources include agricultural field runoff, reservoir releases, wetland drainage and industrial and/or municipal discharges.

A total of 4,028 miles of rivers and streams were identified as capable of supporting a sport fishery from which fish could be used for consumption (Table V-2). The Red River of the North (399.23 miles) and the Missouri River from Garrison Dam to Lake Oahe are the only two rivers listed in the state's fish consumption advisory. Methyl-mercury data collected for these advisories were used, along with fish population estimates provided by the North Dakota Game and Fish Department, to estimate the weighted average methyl-mercury concentration for fish in each of these rivers (see Part IV. F., Chapter 3 and Appendices B-E). Based on the EPA fish tissue of 0.3 μg methyl-mercury/gram of fish tissue, only the Red River of the North was assessed as not supporting fish consumption. While there are many potential sources of methyl-mercury, both anthropogenic and natural, to date there have been no specific causes or sources identified for the mercury present in North Dakota fish (Tables V-3 and V-4).

Table V-4. Impairment Source Summary for Rivers and Streams in North Dakota

Source	Miles
Riparian Grazing	5,495.02
Animal Feeding and Handling Operations	3,840.68
Crop Production (Dryland)	2,616.48
Loss of Riparian Habitat	2,517.50
Stormwater Runoff	893.38
Source Unknown	746.27
Highway and Road Runoff	671.76
Streambank Modification	638.62
Channel Erosion/Incision from Upstream Hydromodifications	598.25
Rangeland/Pastureland Grazing	587.63
Wetland Loss (Drainage/Filling)	553.51
Upstream Impoundments	525.04
On-site Treatment Systems (Septic Systems)	380.48
Channelization	297.16
Hydrostructure Flow Regulation/Modification	296.77
Land Development	123.16
Flow Alteration for Water Diversion	103.35
Industrial Point Source Discharge	78.45
Source Outside State Jurisdiction or Border	59.56
Natural	52.63
Dam Construction	34.39
Irrigated Crop Production	21.62
Golf Courses	14.41

B. Lakes and Reservoirs

Chapter 1. Assessment Category Summary

Table V-5 provides an assessment category summary for lakes and reservoirs in the state. One lake was classified as Category 1, meaning all uses were assessed and were fully supporting. Forty-eight lakes and reservoirs totaling 156,655 acres were assessed as Category 2. These are lakes and reservoirs where at least one designated use was assessed as fully supporting, but the other uses were not assessed. A total of four lakes and reservoirs were assessed as Category 4A, meaning at least one designated use was impaired or threatened but a TMDL is not required because a TMDL already has been completed and approved by EPA. Forty-seven lakes and reservoirs totaling 516,442 acres were assessed where at least one beneficial use is impaired and a TMDL is required. These Category 5 lakes and reservoirs are provided in the state's TMDL list (Tables VI-1 through VI-4). There were 124 lakes and reservoirs with either no data or insufficient data available to assess any of the waterbody's designated uses.

Table V-5. Assessment Category Summary for Lakes and Reservoirs in North Dakota (Acres)

Category	Description	Number AUs	Total Size (acres)
1	All uses met	1	885.3
2	Some uses met, others not assessed	48	156,654.8
3	No uses assessed	124	39,001.81
4A	Some or all uses impaired or threatened, but a TMDL(s) has been approved for all impaired uses.	4	1,934.8
4B	Some or all uses impaired or threatened, but other pollutant controls will result in water quality standards attainment.	0	0
4C	Some or all uses impaired or threatened, but impairment is not due to a pollutant.	0	0
5	Some or all uses impaired or threatened and a TMDL is required.	47	516,442.3

Chapter 2. Water Quality Summary

A total of 100 lakes and reservoirs (33 natural lakes and 67 reservoirs), representing 675,917 surface acres, were assessed for this report. The remaining 124 lakes and reservoirs not assessed represent 39,002 acres or only 5.4 percent of the total lake and reservoir acres in the state.

For purposes of this report, the term "aquatic life use" is synonymous with biological integrity and is defined as the ability of a lake or reservoir to support and maintain a balanced, adaptive community of aquatic organisms (e.g., fish, zooplankton, phytoplankton, macroinvertebrates,

vascular plants) having a species composition, diversity and functional organization comparable to that of least-impaired reference lakes and reservoirs in the region (modified from Karr et al., 1981). Ninety-seven lakes and reservoirs, representing 675,745 acres, were assessed as fully supporting aquatic life use (Table V-6); in other words, they are considered capable of supporting and maintaining a balanced community of aquatic organisms. Of this total, 37 lakes and reservoirs representing 378,760 acres are considered threatened (Table V-6). A threatened assessment means that if water quality and/or watershed trends continue, it is unlikely these lakes will continue to support aquatic life use. The lakes and reservoirs will begin to experience more frequent algal blooms and fish kills. They will display a shift in trophic status from a mesotrophic or eutrophic condition to a hypereutrophic condition. Only three lakes, totaling 172 acres, were assessed as not supporting aquatic life use (Table V-6).

Table V-6. Individual Use Support Summary for Lakes and Reservoirs in North Dakota (Acres)

Use	Fully Supporting	Fully Supporting but Threatened	Not Supporting	Not Assessed	Insufficient Information for Assessment	Total Size
Aquatic Life	296,985.1	378,760.3	171.8	32,738.7	6,263.1	714,919.0
Fish Consumption	0	0	493,231	214,802.7	0	708,033.7
Recreation	526,318.6	143,996.8	5,565.0	36,612.8	2,425.8	714,919.0
Drinking Water Supply	368,762.0	0	0	338,635.7	226.0	707,623.7

One of the primary causes of aquatic life impairment to the state's lakes and reservoirs is low dissolved oxygen in the water column (Table V-7). Low dissolved oxygen in lakes can occur in summer (referred to as summer kills), but usually occurs in the winter under ice-cover conditions. Low dissolved oxygen conditions and winter kills occur when senescent plants and algae decompose, consuming available oxygen. Because the lake is ice covered, re-aeration is minimal, and the lake goes anoxic, resulting in a fish kill. While fish kills are the most apparent impact affecting sensitive fish species (e.g., walleye, trout, bass, bluegill, crappie, northern pike), other DO-sensitive aquatic organisms also may be affected. When fish kills occur, low dissolved oxygen-tolerant fish species (e.g., carp, bullhead, white suckers) will be favored, resulting in a lake dominated by these rough fish species.

Pollutants that stimulate the production of organic matter, such as plants and algae, also can cause aquatic life impairment. Two such secondary pollutant causes are excessive nutrient loading and siltation (Table V-7).

Major sources of nutrient loading to the state's lakes and reservoirs are erosion and runoff from cropland, runoff from animal feeding operations (e.g., concentrated livestock feeding and wintering operations), and hydrologic modifications (Table V-8). Hydrologic modifications, such as wetland drainage, channelization and ditching, increase the runoff and delivery rates to lakes and reservoirs, in effect, increasing the size of a lake's watershed. Nutrients, sediment and

organic matter that would be retained in wetlands under normal conditions become part of the lake's external budget.

Other sources of nutrient loading that affect lakes in the state are point source discharges from municipal wastewater treatment facilities, urban/stormwater runoff and shoreline development (Table V-8).

Table V-7. Impairment Summary for Lakes and Reservoirs in North Dakota

Impairment	Acres
Oxygen Depletion	377,169.5
Temperature	368,231.0
Nutrients	149,848.8
Sedimentation/Siltation	6,826.3
Turbidity	1,488.3
Total Dissolved Solids	36.8
Mercury in Fish Tissues	493,231.0

Shoreline or cabin development directly contributes nutrients to lakes in many ways. Typically, lake cabins or homes use septic systems (tanks and drain fields) to contain their wastewater. Many of these systems are poorly designed, poorly maintained or nonexistent. Poorly designed septic systems provide a direct path of nutrients from the cabin to the lake. In addition, cabins or homes along lakes can contribute nutrients through fertilizer runoff from lawns.

Shoreline development can indirectly lead to increased nutrient loading when development results in a loss of the natural vegetation surrounding the lake. This buffer, between the lake and its watershed, provides for the assimilation of nutrients and retention of sediments contained in the runoff from the surrounding landscape. When this buffer is lost or degraded due to development, nutrients, sediment and other chemicals (e.g., pesticides, road salts) are afforded a direct path to the lake.

The previously mentioned sources are considered external or watershed-scale sources of nutrient loading. Another source that can represent a significant portion of the nutrient budget at times is internal cycling, particularly in those lakes that periodically go anoxic either during ice cover or through thermal stratification in the summer. Under these circumstances, phosphorus and reduced forms of nitrogen (e.g., ammonia) can be released into the water column. The increased nutrient concentrations impair use by stimulating noxious weed growth and algal blooms.

Recreation use (e.g., swimming, waterskiing, boating, sailing, sunbathing) was assessed for 675,880 lake and reservoir acres in the state. Of this total, three lakes, representing 5,565 acres, were assessed as not supporting use for recreation (Table V-6). The primary cause of use impairment is excessive nutrient loading, which results in nuisance algal blooms and noxious

aquatic plant growth (Table V-7). Sources of nutrients causing algal blooms and weed growth were described earlier (Table V-8). Forty-four lakes and reservoirs, totaling 143,997 acres, were assessed as threatened (Table V-6). Nutrient loading also is linked to the negative water quality trends these lakes are experiencing. If left unchecked, these lakes will degrade to the point where frequent algal blooms and/or excessive weed growth will negatively affect recreation.

Two-hundred and nine lakes and reservoirs, representing 701,189 acres, were assigned the use for fish consumption (Table V-6). Lakes not assigned the fish consumption use are saline lakes that cannot support a sport fishery. These lakes are also not assigned the use for municipal drinking water supply.

Of the 209 lakes entered into the ADB and assigned a use for fish consumption, only Devils Lake and Lake Sakakawea had sufficient methyl-mercury fish tissue data and fish population survey data necessary to calculate weighted average concentrations and to assess fish consumption use. Based on these data (see Appendices B-E), both were assessed as not supporting fish consumption use (Table V-6). The remaining 207 lakes and reservoirs that support a sport fishery were not assessed for this report.

Sources of methyl-mercury in fish remain largely unknown. Potential sources of mercury include natural sources, atmospheric deposition, and runoff from cropland containing grain that was treated with a mercury-based fungicide. (Note: The use of these fungicides is now prohibited.) Results of a report prepared by the department show an increase in mercury concentrations in the fillets of walleye, northern pike and chinook salmon in Lake Sakakawea following the drought and recent filling of the lake (Pearson et al., 1997). One possible reason for the higher mercury concentrations in fish is that the lake may be experiencing an increase in the rate of mercury methylization due to greater amounts of organic matter in the lake following flooding. The drought of the late 1980s and early 1990s lowered the lake level, allowing vast areas of dry lake bed to re-vegetate. When the lake began refilling in 1993, the vegetation was flooded and began decomposing. The organic matter provided to the lake during this period is thought to have favored the methylization process. This is a microbial process whereby bacteria present in the lake convert elemental mercury to its more bioavailable methyl-mercury form. The increase in bioavailable mercury in the lake is reflected in higher mercury concentrations in fish.

Four reservoirs (Lake Sakakawea, Homme Dam, Bisbee Dam and Mt. Carmel Reservoir) are currently used either directly or indirectly as municipal drinking water supplies, while two others (Patterson Lake and Renwick Dam) serve as back-up water supplies in the event the primary water supplies should fail.

Homme Dam, Mt. Carmel Reservoir and Lake Sakakawea were assessed as fully supporting drinking water supply use (Table V-6). Drinking water supply use was not assessed for the remaining lakes and reservoirs.

Table V-8. Impairment Source Summary for Lakes and Reservoirs in North Dakota

Source	Acres
Source Unknown	493,267.8
Hydrostructure Flow Regulation/Modification	368,231.0
Crop Production (Dryland)	149,923.8
Anoxia Due to Thermal Stratification/ Eutrophication	148,726.8
Rangeland/Pastureland Grazing	134,005.5
Wetland Loss (Drainage/Filling)	133,217.9
Stormwater Runoff	125,796.6
Riparian Grazing	14,708.0
Animal Feeding and Handling Operations	13,716.7
On-site Treatment Systems (Septic Systems)	11,491.9
Sediment Resuspension	2,438.9
Upstream Impoundments	2,086.0
Internal Nutrient Recycling	2,086.0
Loss of Riparian Habitat	414.0
Land Development	414.0
Silviculture	414.0
Flow Alteration for Water Diversion	323.5
Highway and Road Runoff	297.3
Surface Mining	260.5
Streambank Modification	198.5
Land Application of Biosolids/Septage Disposal	55.2

Chapter 3. Trophic Status

Reservoirs and natural lakes were assessed for trophic status only if appropriate data were available. For purposes of this report, "trophic status" refers to the present condition or measure of eutrophication of the waterbody at the time of the assessment.

Accurate trophic status assessments are essential to making sound management decisions. In order to minimize errors in classification, all existing chemical, physical, quantitative and qualitative data were used in making final trophic status assessments.

Because there are no TSIs specific to North Dakota waters, Carlson's TSI (Carlson, R. E. 1977, "A Trophic State Index for Lakes," *Limnology and Oceanography*, 22(2):361-369) was chosen as the initial method to describe a lake's or reservoir's trophic status. Carlson's TSI was selected because it is commonly used by limnologists and because it was developed for Minnesota, a state geographically close to North Dakota.

An attempt was made to gather enough chemical and ancillary data to group as many of North Dakota's 224 lakes/reservoirs into one of four trophic states (Table V-9). The four trophic states, in order of increasing productivity, are oligotrophic, mesotrophic, eutrophic and hypereutrophic. Adequate data was available to assess the trophic status of 113 of the 224 lakes entered into the ADB database. The majority of the state's assessed lakes and reservoirs range from eutrophic to hypereutrophic. Twenty lakes and reservoirs were assessed as mesotrophic. There were no oligotrophic lakes assessed in the state.

Table V-9. Trophic Status of Lakes and Reservoirs in North Dakota

Trophic Status	Number of Lakes	Acreage of Lakes
Oligotrophic	0	0.0
Mesotrophic	20	503,299.51
Eutrophic	52	20,759.50
Hypereutrophic	51	156,144.60
Not Assessed	101	34,715.40
Total Number of Lakes	224	714,919.01

PART VI. SECTION 303(d) LIST OF WATER QUALITY-LIMITED WATERS NEEDING TMDLs

A. Background

Section 303(d) of the CWA and its accompanying regulations (CFR Part 130 Section 7) require each state to list waterbodies (i.e., lakes, reservoirs, rivers, streams and wetlands) that are considered water quality-limited and require load allocations, waste load allocations, and TMDLs. This list has become known as the "TMDL list" or "Section 303(d) list."

A waterbody is considered water quality limited when it is known that its water quality does not or is not expected to meet applicable standards. Waterbodies can be water quality limited due to point source pollution, NPS pollution or both.

In considering whether or not applicable water quality standards are being met, the state should consider not only the narrative and numeric criteria set forth in the standards to protect specific uses, but also the classified uses defined for the waterbody and whether the use or uses are fully supported or not supported due to any pollutant source or cause. Therefore, a waterbody could be considered water quality limited when it can be demonstrated that a beneficial use (e.g., aquatic life or recreation) is impaired, even when there are no demonstrated exceedences of either the narrative or numeric criteria. In cases where there is a use impairment but no exceedence of the numeric standard, the state should provide information as to the cause of the impairment. Where the specific pollutant (e.g., copper or phosphorus) is unknown, a general cause category (e.g., metals or nutrients) should be included with the waterbody listing.

Section 303(d) and accompanying EPA regulations and policy require only impaired and threatened waterbodies to be listed, and TMDLs developed, when the source of impairment is a pollutant. Pollution, by federal and state definition, is "any man-made or man-induced alteration of the chemical, physical, biological and radiological integrity of water." Based on the definition of a pollutant provided in Section 502(6) of the CWA and in 40 CFR 130.2(d), pollutants would include temperature, ammonia, chlorine, organic compounds, pesticides, trace elements, nutrients, biochemical oxygen demand (BOD), sediment and pathogens. Waterbodies impaired by habitat and flow alteration and the introduction of exotic species would not be included in the Section 303(d) TMDL list, as these impairment categories would be considered pollution and not pollutants. In other words all pollutants are pollution, but not all pollution is a pollutant.

Where a waterbody is water quality limited, the state is required to determine, in a reasonable time frame, the reduction in pollutant loading necessary for that waterbody to meet water quality standards, including its beneficial uses. The process by which the pollutant-loading capacity of a waterbody is determined and the load is allocated to point and nonpoint sources is called a total maximum daily load or TMDL. While the term TMDL implies that loading capacity is determined on a daily time scale, TMDLs can range from meeting an instantaneous concentration (i.e., an acute standard) to computing an acceptable annual phosphorus load for a lake or reservoir.

Section 303(d) requires states to submit their lists of water quality-limited waterbodies "from time to time." Federal regulations have clarified this language; therefore, beginning in 1992 and

by April 1 of every even-numbered year thereafter, states are required to submit a revised list of waters needing TMDLs. North Dakota's 2002 TMDL list was submitted to EPA in March 2003 and was approved in April 2003. This 2004 Section 303(d) list includes waterbodies not meeting water quality standards, waterbodies needing TMDLs, and waterbodies that have been removed from the 2002 list. Reasons for removing a waterbody from the 2002 list include (1) a TMDL has been completed for the waterbody and approved by EPA; (2) current data and/or information suggests the waterbody is now meeting water quality standards; (3) data and/or information used to list the waterbody as water quality limited has been determined to be insufficient and/or of poor quality; (4) the assessment was made based on best professional judgement; (5) the cause of the use impairment was related to a pollutant for which there is not clearly defined or scientifically defensible chemical criteria (e.g., nutrients); or (6) the water quality impairment is not due to a pollutant.

This listing report also corrects inconsistencies between the 1998 list and the 2002 list raised by EPA. Many of these inconsistencies were resolved by re-listing the waterbody in 2004 for the pollutant of concern originally listed in 1998. In other cases, the 1998 waterbody and the pollutant of concern have been included in the 2004 list of waterbodies to be de-listed. If a waterbody is included in the de-listed waterbodies, further clarification has been provided in the rationale for de-listing.

Along with the TMDL list, states are required to provide documentation to the EPA Regional Administrator in support of the state's decision to list or not list waterbodies. Information supporting North Dakota's 2004 TMDL list is provided in Part IV "Assessment Methodology." At a minimum, a state's supporting information should include (1) a description of the methodology used to develop the list; (2) a description of the data and information used to develop the list; (3) the rationale for any decision to not use this information; (4) the rationale for removing waterbodies previously listed as water quality limited; and (5) a summary of comments received on the list during the state's public comment period.

Following an opportunity for public comment, the state must submit its list to the EPA Regional Administrator. The EPA Regional Administrator then has 30 days to either approve or reject the state listings. If the EPA Regional Administrator rejects a state submittal, EPA then has 30 days to develop a list for the state. This list also is required to undergo public comment prior to finalization.

B. Prioritization of TMDL Listed Waters

When a state prepares its list of water quality-limited waterbodies, it is required to prioritize waterbodies for TMDL development and to identify those waterbodies that will be targeted for TMDL development within the next two years. Factors to be considered when prioritizing waterbodies for TMDL development include (1) the severity of pollution and the uses which are impaired; (2) the degree of public interest or support for the TMDL, including the likelihood of implementation of the TMDL; (3) recreational, aesthetic and economic importance of the waterbody; (4) the vulnerability or fragility of a particular waterbody as an aquatic habitat, including the presence of threatened or endangered species; (5) immediate programmatic needs, such as wasteload allocations needed for permit decisions or load allocations for Section 319 NPS project implementation plans; and (6) national policies and priorities identified by EPA.

After considering each of the six factors, the state has developed a three-tiered priority ranking. AUs listed as Priority 1 have been further categorized. Priority 1A are lakes and reservoirs and river and stream segments for which TMDLs are scheduled to be completed and submitted to EPA in the next two years. Priority 1B are lakes and reservoirs and river and stream segments for which TMDL development projects are scheduled to be started in the next two years. The majority of these Priority 1A and 1B AUs were identified as such based largely on their degree of public support and interest and the likelihood of implementation of the TMDL once completed. Priority 2 AUs are those river and stream segments and lakes and reservoirs that are scheduled for completion in the next 10 years.

Waterbodies for which fish consumption use is impaired due to methyl-mercury are considered Priority 3. These AUs are a low priority for TMDL development in the state. TMDL development for methyl-mercury-contaminated waterbodies is complicated by several factors, including: (1) uncertainty regarding the fate and transport of atmospheric sources of mercury; and (2) the complexity of the biological and geochemical interactions that affect the conversion of elemental mercury to methyl-mercury and its bioaccumulation rate in fish. Due to these complexities and the interstate and international nature of atmospheric mercury sources, it is the department's recommendation that EPA take the lead in developing mercury TMDLs.

C. Public Participation Process

Public comment was solicited on the draft 2004 TMDL list through a public notice published on March 25 and 29, 2004, in the daily newspapers located in Fargo, Grand Forks, Bismarck, Minot, Dickinson and Williston (Appendix F). The public notice encouraged interested parties to obtain a copy of the draft TMDL list by contacting the department in writing, by phone, or by accessing the list through the department's website at www.health.state.nd.

Comment on the draft TMDL list also was requested through mail or email from individuals and specific agencies and organizations. These included the South Dakota Department of Environment and Natural Resources, Minnesota Pollution Control Agency (Detroit Lakes Regional Office), the Natural Resources Conservation Service, the U.S. Fish and Wildlife Service, the U.S. Forest Service, the North Dakota Game and Fish Department, the State Water Commission, the Red River Basin Commission, individuals on the State Water Pollution Advisory Board, and EPA Region VIII. Comments were received only from EPA Region VIII. These comments and the department's response are provided in Appendix G. Where appropriate, these comments have been incorporated in this final 2004 Integrated Report.

D. Listing of Impaired Waters Needing TMDLs

As stated previously, for 2004 Section 305(b) reporting and Section 303(d) TMDL listing states were encouraged to follow the "Integrated Reporting Guidance"(EPA, 2003). This guidance suggests that states place their assessed waterbodies into one of five assessment categories (Table IV-1). Waterbodies (also referred to as AUs) assessed as Category 5 form the basis of the state's Section 303(d) TMDL list. Tables VI-1, VI-2, VI-3 and VI-4 provide a list of AUs in the Souris, Red, Missouri and James river basins respectively that are impaired and in need of TMDLs (i.e., Category 5). These impaired waters also are depicted graphically for the Souris River Basin

(Figure VI-1), the Upper and Lower Red River basins (Figures VI-2 and VI-3), the Lake Sakakawea and Lake Oahe sub-basins of the Missouri River Basin (Figures VI-4 and VI-5), and the James River Basin (Figure VI-6). The 2004 TMDL list is represented by 211 AUs (47 lakes and reservoirs and 164 river and stream segments) and 363 individual waterbody-pollutant combinations. For purposes of TMDL development, each waterbody-pollutant combination requires a TMDL.

While not specifically assessed for purposes of this report, the biotic community functions of isolated wetlands in the state currently are considered vulnerable to loss from filling and drainage and to contamination from chemical pollutants. For example, the department considers wetlands in the Lostwood National Wildlife Refuge and Wilderness Area to be particularly vulnerable to methyl-mercury contamination from nearby coal-fired power plants, which is exacerbated by the natural water level fluctuations and the burning of adjacent uplands. Assuming financial resources are available, this risk of contamination should be assessed through additional monitoring.

E. De-listing of 2002 Listed TMDL Waters

Table VI-5 provides a list of lakes, reservoirs, rivers and streams that were listed in the previous 2002 TMDL list but that have been removed from this year's Section 303(d) list submittal. Table VI-5 also contains further clarification for waterbodies listed in the 1998 TMDL list that were de-listed in 2002. AUs were removed from the TMDL list for a number of reasons. The following are the primary reasons for de-listing an AU:

- Based on most recent data, use is fully supported.
- Use impairment is due to a nonpollutant (habitat).
- Sufficient credible data and/or information is lacking to make a use support determination.

In most cases, when the original assessment was judged not to be representative of current water quality conditions due to a lack of sufficient credible data, one of the following usually occurred:

- The data used to conduct the assessment are now more than 10 years old for rivers and streams and 12 years old for lakes and reservoirs, and based on best professional judgement, the assessment is no longer believed to be valid. This would occur if it is believed that water quality has been altered due to significant changes in land use and/or due to climatic changes.
- The original assessment was based only on best professional judgement.
- The original assessment was based on data extrapolated from a monitoring station(s) located in an adjacent AU.

River and stream AUs listed during the last cycle as threatened or impaired due to nutrients also were de-listed. These AUs will remain off the TMDL list until scientifically defensible nutrient criteria are developed.

Table VI-1. 2004 List of Section 303(d) TMDL Waters for the Souris River Basin in North Dakota

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-09010001-001-L_00	Short Creek Dam	96.3 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrients/Eutrophication	1B
					Oxygen, Dissolved	1B
					Sedimentation/Siltation	1B
			Recreation	Fully Supporting but Threatened	Nutrients/Eutrophication	1B
ND-09010001-001-S_00	Souris River from the ND-Saskatchewan border downstream to Lake Darling	43.4 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrients/Eutrophication	1B
					Oxygen, Dissolved	1B
					Metals	1B
					Sedimentation/Siltation	1B
			Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1B
ND-09010001-002-S_01	Long Creek mainstem	25 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-09010001-006-S_00	Souris River from Lake Darling downstream to its confluence with the Des Lacs River	30.2 miles	Fish and Other Aquatic Biota	Not Supporting	Biological Indicators	2
ND-09010002-002-L_00	Northgate Dam	150.8 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrients/Eutrophication	1A
					Oxygen, Dissolved	1A
					Sedimentation/Siltation	1A
			Recreation	Fully Supporting but Threatened	Nutrients/Eutrophication	1A

Table VI-1. 2004 List of Section 303(d) TMDL Waters for the Souris River Basin in North Dakota (cont.)

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-09010003-001-L_00	Carbury Dam	130 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Oxygen, Dissolved	1A
					Sedimentation/Siltation	1A
			Recreation	Fully Supporting but Threatened	Nutrients/Eutrophication	1A
ND-09010003-001-S_00	Souris River from its confluence with Oak Creek downstream to its confluence with the Wintering River	51.7 miles	Fish and Other Aquatic Biota	Fully Supporting bu Threatened	Sedimentation/Siltation	2
ND-09010003-003-S_00	Wintering River, including tributaries	195.9 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Oxygen, Dissolved	2
					Sedimentation, Siltation	2
			Recreation	Not Supporting	Total Fecal Coliform	2
ND-09010003-005-S_00	Souris River from its confluence with the Wintering River downstream to its confluence with Willow Creek	76.2 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Oxygen, Dissolved	2
					Sedimentation/Siltation	2
ND-09010003-009-S_00	Boundary Creek, including tributaries	143.8 miles	Recreation	Not Supporting	Total Fecal Coliform	2
ND-09010004-001-S_00	Willow Creek from its confluence with Ox Creek downstream to its confluence with the Souris River	39.4 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-09010004-002-L_00	Long Lake	287 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrients/Eutrophication	2
					Oxygen, Dissolved	2

[1] Priority 1A are those AUs for which TMDLs are scheduled for completion in the next two years. Priority 1B are AUs for which TMDL development activities (e.g., monitoring or modeling) are scheduled to begin in the next two years. Priority 2 are those AUs which are scheduled for TMDL development in the next 10 years. AUs listed as Priority 3 are listed as impaired for fish consumption due to methyl-mercury. These AUs are a low priority for the state due to complexities related to the fate and transport of methyl-mercury and due to the interstate and international nature of atmospheric mercury sources. It is the department's recommendation that EPA take the lead in developing mercury TMDLs.

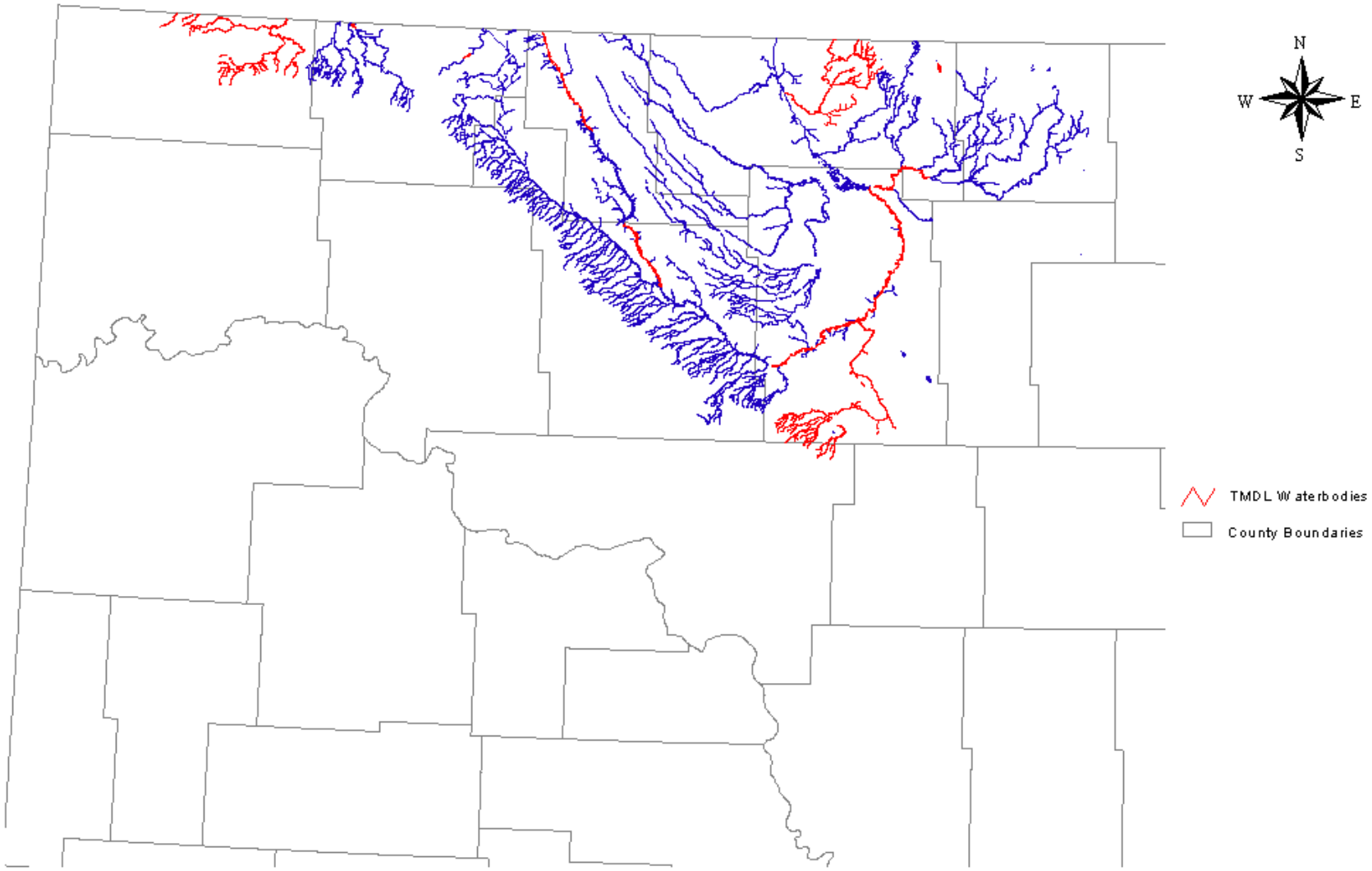

Figure VI-1. Graphical Depiction of 2004 List of Impaired Waters Needing TMDLs in the Souris River Basin

Table VI-2. 2004 List of Section 303(d) TMDL Waters for the Red River Basin in North Dakota

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-09020101-001-S_00	Bois De Sioux River from the ND-SD border downstream to its confluence with the Rabbit River	12.77 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	2
					Biological Indicators	2
ND-09020101-002-S_00	Bois De Sioux River from its confluence with the Rabbit River downstream to its confluence with the Ottertail River	15.03 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	2
					Biological Indicators	2
ND-09020104-001-S_00	Red River of the North from its confluence with the Ottertail River downstream to its confluence with Whiskey Creek	26.81 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
			Fish Consumption	Not Supporting	Methyl-mercury	3
ND-09020104-002-S_00	Red River of the North from its confluence with Whiskey Creek downstream to its confluence with the Wild Rice River	51.64 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
			Fish Consumption	Not Supporting	Methyl-mercury	3
ND-09020104-003-S_00	Red River of the North from its confluence with the Wild Rice River downstream to the 12th Ave bridge in Fargo, ND (just upstream from the Moorhead, MN wastewater discharge)	21 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1A
			Fish Consumption	Not Supporting	Methyl-mercury	3
ND-09020104-004-S_00	Red River of the North from the 12th Ave N bridge in Fargo, ND downstream to its confluence with the Sheyenne River	20.09 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Ammonia	1A
					BOD, carbonaceous	1A
					Oxygen, Dissolved	1A
			Recreation	Not Supporting	Total Fecal Coliform	1A
			Fish Consumption	Not Supporting	Methyl-mercury	3

Table VI-2. 2004 List of Section 303(d) TMDL Waters for the Red River Basin in North Dakota (cont.)

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-09020104-005-S_00	Red River of the North from its confluence with the Sheyenne River downstream to its confluence with the Buffalo River	10.45 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1A
			Fish Consumption	Not Supporting	Methyl-mercury	3
ND-09020105-001-L_00	Lake Elsie	260.5 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	2
					Turbidity	2
ND-09020105-001-S_00	Wild Rice River from its confluence with the Colfax watershed downstream to its confluence with the Red River of the North	38.01 miles	Fish and Other Aquatic Biota	Not Supporting	Sedimentation/Siltation	1B
					Biological Indicators	1B
			Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1B
ND-09020105-002-L_00	Mooreton Pond	36.8 acres	Fish and Other Aquatic Biota	Not Supporting	Total Dissolved Solids	1B
					Turbidity	1B
ND-09020105-003-S_00	Wild Rice River from its confluence with a tributary NE of Great Bend, ND downstream to its confluence with the Colfax watershed	51.8 miles	Fish and Other Aquatic Biota	Not Supporting	Sedimentation/Siltation	1B
					Organic Enrichment/ Oxygen, Dissolved	1B
ND-09020105-005-S_00	Antelope Creek downstream to its confluence with the Wild Rice River	40.09 miles	Fish and Other Aquatic Biota	Not Supporting	Sedimentation/Siltation	1B
					Temperature, water	1B
ND-09020105-009-S_00	Wild Rice River from Elk Creek downstream to its confluence with a tributary NE of Great Bend, ND	52.31 miles	Fish and Other Aquatic Biota	Not Supporting	Sedimentation/Siltation	1B
					Organic Enrichment/ Oxygen, Dissolved	1B
			Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1B

Table VI-2. 2004 List of Section 303(d) TMDL Waters for the Red River Basin in North Dakota (cont.)

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-09020105-012-S_00	Wild Rice River from its confluence with Shortfoot Creek downstream to its confluence with Elk Creek	44.78 miles	Fish and Other Aquatic Biota	Not Supporting	Sedimentation/Siltation	1A
			Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1A
ND-09020105-016-S_00	Shortfoot Creek from its confluence with the Wild Rice River upstream to the ND-SD border, including tributaries	16.16 miles	Recreation	Not Supporting	Total Fecal Coliform	1A
ND-09020105-017-S_00	Unnamed tributaries to the Wild Rice River (ND-09020105-015-S), including Crooked Creek	16.17 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1A
ND-09020105-018-S_00	Wild Rice River from its confluence with the Silver Lake diversion downstream to Lake Tewaukon	18.82 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1A
ND-09020105-019-S_00	Wild Rice River upstream from its confluence with Wild Rice Creek, including tributaries	57.06 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1A
ND-09020105-020-S_00	Wild Rice Creek from its confluence with the Wild Rice River upstream to the ND-SD border, including tributaries	118.17 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1A
ND-09020105-022-S_00	Wild Rice River from its confluence with Wild Rice Creek downstream to its confluence with the Silver Lake diversion	5.54 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1A

Table VI-2. 2004 List of Section 303(d) TMDL Waters for the Red River Basin in North Dakota (cont.)

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-09020107-001-S_00	Red River of the North from its confluence with the Buffalo River downstream to its confluence with the Elm River	29.4 miles	Fish Consumption	Not Supporting	Methyl-mercury	3
ND-09020107-006-S_00	Elm River from dam NE of Galesburg, ND downstream to its confluence with the South Branch Elm River	29.9 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	2
ND-09020107-008-S_00	Elm River from dam NW of Galesburg, ND downstream to dam NE of Galesburg	20.49 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	2
ND-09020107-011-S_00	North Branch Elm River downstream to its confluence with the Elm River	33.4 miles	Fish and Other Aquatic Biota	Not Supporting	Sedimentation/Siltation	2
ND-09020107-014-S_00	Red River of the North from its confluence with the Elm River downstream to its confluence with the Marsh River	29.83 miles	Fish Consumption	Not Supporting	Methyl-mercury	3
ND-09020109-001-S_00	Goose River from a tributary upstream from Hillsboro, ND downstream to its confluence with the Red River of the North	27.68 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-09020109-002-L_00	South Golden Lake	323.5 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrients/Eutrophication	2
					Oxygen, Dissolved	2
			Recreation	Fully Supporting but Threatened	Nutrients/Eutrophication	2
ND-09020109-007-S_00	North Branch Goose River downstream to its confluence with the Goose River	37.12 miles	Fish and Other Aquatic Biota	Not Supporting	Biological Indicators	2

Table VI-2. 2004 List of Section 303(d) TMDL Waters for the Red River Basin in North Dakota (cont.)

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-09020109-011-S_00	Goose River from its confluence with Beaver Creek downstream to its confluence with the South Branch Goose River	19.38 miles	Fish and Other Aquatic Biota	Not Supporting	Sedimentation/Siltation	2
ND-09020109-027-S_00	Beaver Creek downstream to the Golden Lake Diversion channel	37.01 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	2
ND-09020109-034-S_00	Little Goose River from Little Goose River National Wildlife Refuge downstream to the Goose River	28.64 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	2
ND-09020201-006-L_00	Devils Lake	125000 acres	Recreation	Fully Supporting but Threatened	Nutrients/Eutrophication	2
			Fish Consumption	Not Supporting	Methyl-mercury	3
ND-09020202-001-L_00	Warsing Dam.	53.4 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrients/Eutrophication	2
					Sedimentation/Siltation	2
					Oxygen, Dissolved	2
			Recreation	Fully Supporting but Threatened	Nutrients/Eutrophication	2
ND-09020202-001-S_00	Sheyenne River from its confluence with theWarsing Dam watershed downstream to the end of the hydrologic unit boundary	8.9 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	2
ND-09020202-002-L_00	Balta Dam	108 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrients/Eutrophication	2
					Oxygen, Dissolved	2
			Recreation	Fully Supporting but Threatened	Nutrients/Eutrophication	2
ND-09020202-004-S_00	Sheyenne River from its confluence with Big Coulee downstream to its confluence with the Warsing Dam watershed (ND-09020202-003-S)	40.37 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	2
ND-09020202-006-S_00	Sheyenne River from Harvey Dam downstream to its confluence with Big Coulee	35.06 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	2

Table VI-2. 2004 List of Section 303(d) TMDL Waters for the Red River Basin in North Dakota (cont.)

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-09020202-012-S_00	Sheyenne River from Coal Mine/Sheyenne Lakes downstream to Harvey Dam	6.19 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-09020203-001-L_00	Lake Ashtabula	5430 acres	Recreation	Not Supporting	Nutrients/Eutrophication	2
ND-09020203-002-S_00	Baldhill Creek from tributary watershed (ND-09020203-005-S) downstream to Lake Ashtabula	30.21 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1A
ND-09020203-004-L_00	Red Willow Lake	130 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrients/Eutrophication	2
					Oxygen, Dissolved	2
			Recreation	Fully Supporting but Threatened	Nutrients/Eutrophication	2
ND-09020203-004-S_00	Silver Creek, including Gunderson Creek and all tributaries	38.51 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-09020203-007-L_00	McVille Dam	33.4 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrients/Eutrophication	2
					Sedimentation/Siltation	2
					Oxygen, Dissolved	2
			Recreation	Fully Supporting but Threatened	Nutrients/Eutrophication	2
ND-09020203-008-L_00	Tolna Dam	152 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrients/Eutrophication	2
					Sedimentation/Siltation	2
					Oxygen, Dissolved	2
			Recreation	Fully Supporting but Threatened	Nutrients/Eutrophication	2
ND-09020203-008-S_00	Unnamed tributary watershed to Baldhill Creek (ND-09020203-007-S)	16.07 miles	Recreation	Not Supporting	Total Fecal Coliform	1A

Table VI-2. 2004 List of Section 303(d) TMDL Waters for the Red River Basin in North Dakota (cont.)

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-09020203-012-S_00	Pickerel Lake Creek, including tributaries	28.04 miles	Recreation	Not Supporting	Total Fecal Coliform	1A
ND-09020203-013-S_00	Unnamed tributary watershed to the Sheyenne River (ND-09020203-001-S)	33.92 miles	Recreation	Not Supporting	Total Fecal Coliform	1A
ND-09020203-018-S_00	Sheyenne River from the upstream end of the hydrologic unit boundary downstream to the Tolna Dam outlet	56.61 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	2
ND-09020204-003-L_00	Brewer Lake	128 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrients/Eutrophication	1B
					Oxygen, Dissolved	1B
					Sedimentation/Siltation	1B
			Recreation	Fully Supporting but Threatened	Nutrients/Eutrophication	1B
ND-09020204-003-S_00	Sheyenne River from its confluence with the Maple River downstream to its confluence with the Red River of the North	18.51 miles	Recreation	Not Supporting	Total Fecal Coliform	2
ND-09020204-004-S_00	Rush River from its confluence with an unnamed tributary watershed (ND-09020204-011-S) downstream to its confluence with the Sheyenne River	17.44 miles	Fish and Other Aquatic Biota	Not Supporting	Sedimentation/Siltation	1B
					Organic Enrichment	1B
ND-09020204-005-L_00	Dead Colt Creek Dam	124 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrients/Eutrophication	1A
					Oxygen, Dissolved	1A
					Sedimentation/Siltation	1A
			Recreation	Fully Supporting but Threatened	Nutrients/Eutrophication	1A
ND-09020204-007-S_00	Rush River downstream to unnamed tributary watershed (ND-09020204-011-S)	40.92 miles	Fish and Other Aquatic Biota	Not Supporting	Sedimentation/Siltation	1B
					Organic Enrichment	1B

Table VI-2. 2004 List of Section 303(d) TMDL Waters for the Red River Basin in North Dakota (cont.)

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-09020204-015-S_00	Sheyenne River from its confluence with tributary watershed (ND-09020204-016-S) downstream to tributary (ND-09020204-014-S)	27.68 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	2
ND-09020204-017-S_00	Sheyenne River from unnamed tributary (ND-09020204-018-S) downstream to unnamed tributary watershed (ND-09020204-016-S)	56.72 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	2
ND-09020204-022-S_00	Sheyenne River from tributary near Lisbon (ND-09020204-0024-S) downstream to its confluence with Dead Colt Creek(ND-09020204-021-S)	11.37 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1B
ND-09020204-023-S_00	Tiber Coulee, including tributaries	32.33 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-09020204-027-S_00	Sheyenne River from its confluence with a tributary watershed below Valley City (ND-09020204-028-S) downstream to its confluence with a tributary near Highway 46 (ND-09020204-026-S)	33.59 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	1B

Table VI-2. 2004 List of Section 303(d) TMDL Waters for the Red River Basin in North Dakota (cont.)

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-09020204-034-S_00	Sheyenne River from its confluence with a tributary above Valley City, near railroad bridge (ND-09020204-038-S) downstream to its confluence with a tributary below Valley City (ND-09020204-028-S)	13.18 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	1B
					Biological Indicators	1B
ND-09020204-040-S_00	Sheyenne River from Lake Ashtabula downstream to its confluence with a tributary above Valley City, near railroad bridge (ND-09020204-038-S)	4.13 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	1B
ND-09020205-001-S_00	Maple River from its confluence with Buffalo Creek downstream to its confluence with the Sheyenne River	27.02 miles	Fish and Other Aquatic Biota	Not Supporting	Sedimentation/Siltation	2
					Biological Indicators	2
			Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-09020205-010-S_00	Maple River from its confluence with tributary near Leonard (ND-09020205-011-S) downstream to its confluence with Buffalo Creek	13.96 miles	Fish and Other Aquatic Biota	Not Supporting	Sedimentation/Siltation	2
					Biological Indicators	2
ND-09020301-001-S_00	Red River of the North from its confluence with the Marsh River downstream to its confluence with Sandhill Creek	21.26 miles	Fish Consumption	Not Supporting	Methyl-mercury	3

Table VI-2. 2004 List of Section 303(d) TMDL Waters for the Red River Basin in North Dakota (cont.)

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-09020301-002-S_00	English Coulee from its confluence with a tributary upstream from Grand Forks, ND downstream to its confluence with the Red River of the North (lower reach)	5.53 miles	Fish and Other Aquatic Biota	Not Supporting	Sedimentation/Siltation	2
					Total Dissolved Solids	2
					Organic Enrichment	2
			Recreation	Not Supporting	Total Fecal Coliform	2
					Sedimentation/Siltation	2
ND-09020301-007-S_00	Red River of the North from its confluence with the Sand Hill River downstream to its confluence with Cole Creek	31.13 miles	Fish Consumption	Not Supporting	Methyl-mercury	3
ND-09020301-010-S_00	Red River of the North from its confluence with Cole Creek downstream to its confluence with the Red Lake River	8.06 miles	Fish Consumption	Not Supporting	Methyl-mercury	3
ND-09020301-014-S_00	Red River of the North from its confluence with the Red Lake River downstream to its confluence with English Coulee	4.02 miles	Fish Consumption	Not Supporting	Methyl-mercury	3
ND-09020306-001-S_00	Red River of the North from its confluence with English Coulee downstream to its confluence with Grand Marais Creek	8.65 miles	Fish Consumption	Not Supporting	Methyl-mercury	3
ND-09020306-003-S_00	Red River of the North from its confluence with Grand Marais Creek downstream to its confluence with the Turtle River	12.62 miles	Fish Consumption	Not Supporting	Methyl-mercury	3

Table VI-2. 2004 List of Section 303(d) TMDL Waters for the Red River Basin in North Dakota (cont.)

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-09020306-004-S_00	Red River of the North from its confluence with the Turtle River downstream to its confluence with the Forest River	31.94 miles	Fish Consumption	Not Supporting	Methyl-mercury	3
ND-09020306-005-S_00	Red River of the North from its confluence with the Forest River downstream to its confluence with the Park River	22.02 miles	Fish Consumption	Not Supporting	Methyl-mercury	3
ND-09020307-001-S_00	Turtle River from its confluence with Salt Water Coulee downstream to its confluence with the Red River of the North	30.36 miles	Fish and Other Aquatic Biota	Not Supporting	Cadmium	2
					Sedimentation/Siltation	2
					Selenium	2
					Total Dissolved Solids	2
ND-09020307-006-S_00	Turtle River from its confluence with Kelly Slough downstream to its confluence with Salt Water Coulee	0.65 miles	Fish and Other Aquatic Biota	Not Supporting	Cadmium	2
					Sedimentation/Siltation	2
					Selenium	2
					Total Dissolved Solids	2
ND-09020308-001-L_00	Fordville Dam	197 acres	Recreation	Fully Supporting but Threatened	Nutrients/Eutrophication	2
ND-09020308-001-S_00	Forest River from Lake Ardoch downstream to its confluence with the Red River of the North	16.17 miles	Fish and Other Aquatic Biota	Not Supporting	Biological Indicators	2
					Sedimentation/Siltation	2
					Total Dissolved Solids	2

Table VI-2. 2004 List of Section 303(d) TMDL Waters for the Red River Basin in North Dakota (cont.)

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-09020308-002-L_00	Whitman Dam	143 acres	Recreation	Fully Supporting but Threatened	Nutrients/Eutrophication	2
ND-09020308-003-L_00	Matejcek Dam	130 acres	Recreation	Fully Supporting but Threatened	Nutrients/Eutrophication	2
ND-09020310-001-L_00	Homme Dam	194 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrients/Eutrophication	2
					Sedimentation/Siltation	2
			Recreation	Fully Supporting but Threatened	Nutrients/Eutrophication	2
ND-09020310-001-S_00	Park River from its confluence with Salt Lake outlet (ND-09020310-009-S) downstream to its confluence with the Red River of the North	15.06 miles	Fish and Other Aquatic Biota	Not Supporting	Biological Indicators	2
					Sedimentation/Siltation	2
					Total Dissolved Solids	2
					Organic Enrichment	2
ND-09020310-010-S_00	Park River from its confluence with a tributary east of Grafton, ND (ND-09020310-012-S) downstream to its confluence with the outlet from Salt Lake (ND-09020310-009-S)	14.68 miles	Fish and Other Aquatic Biota	Not Supporting	Sedimentation/Siltation	2
					Total Dissolved Solids	2
					Organic Enrichment	2
ND-09020310-013-S_00	Park River from the confluence of the South Branch Park River and the Middle Branch Park River downstream to its confluence with a tributary east of Grafton, ND (ND-09020310-012-S)	6.83 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	2
					Total Dissolved Solids	2
					Organic Enrichment	2

Table VI-2. 2004 List of Section 303(d) TMDL Waters for the Red River Basin in North Dakota (cont.)

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-09020311-001-S_00	Red River of the North from its confluence with the Park River downstream to its confluence with a small tributary north of Drayton, ND	19.02 miles	Fish Consumption	Not Supporting	Methyl-mercury	3
ND-09020311-003-S_00	Red River of the North from its confluence with a small tributary north of Drayton, ND downstream to its confluence with Two River	30.3 miles	Fish Consumption	Not Supporting	Methyl-mercury	3
ND-09020311-005-S_00	Red River of the North from its confluence with Two River downstream to its confluence with the Pembina River	17.99 miles	Fish Consumption	Not Supporting	Methyl-mercury	3
ND-09020311-007-S_00	Red River of the North from its confluence with the Pembina River downstream to the US-Canada border	3.0 miles	Fish Consumption	Not Supporting	Methyl-mercury	3
ND-09020313-002-L_00	Renwick Dam	220 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	1B
			Recreation	Fully Supporting but Threatened	Nutrients/Eutrophication	1B
ND-09020313-006-S_00	Tongue River from its confluence with a tributary NE of Cavalier, ND downstream to its confluence with Big Slough	22.54 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	1B
ND-09020313-007-L_00	Lake Upsilon	414 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrients/Eutrophication	2
					Sedimentation/Siltation	2
					Oxygen, Dissolved	2
			Recreation	Fully Supporting but Threatened	Nutrients/Eutrophication	2

Table VI-2. 2004 List of Section 303(d) TMDL Waters for the Red River Basin in North Dakota (cont.)

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-09020313-009-S_00	Tongue River from Renwick Dam downstream to its confluence with a tributary NE of Cavalier, ND	15.91 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	1B
ND-09020313-011-L_00	Armourdale Dam	79.8 acres	Fish and Other Aquatic Biota	Not Supporting	Nutrients/Eutrophication	1A
					Oxygen, Dissolved	1A
					Sedimentation/Siltation	1A
			Recreation	Not Supporting	Nutrients/Eutrophication	1A
ND-09020313-021-S_00	Pembina River from its confluence with a tributary west of Neche, ND downstream to its confluence with the Tongue River	32.72 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	2
			Recreation	Fully Supporting, but Threatened	Total Fecal Coliform	2

[1] Priority 1A are those AUs for which TMDLs are scheduled for completion in the next two years. Priority 1B are AUs for which TMDL development activities (e.g., monitoring or modeling) are scheduled to begin in the next two years. Priority 2 are those AUs which are scheduled for TMDL development in the next 10 years. AUs listed as Priority 3 are listed as impaired for fish consumption due to methyl-mercury. These AUs are a low priority for the state due to complexities related to the fate and transport of methyl-mercury and due to the interstate and international nature of atmospheric mercury sources. It is the department's recommendation that EPA take the lead in developing mercury TMDLs.

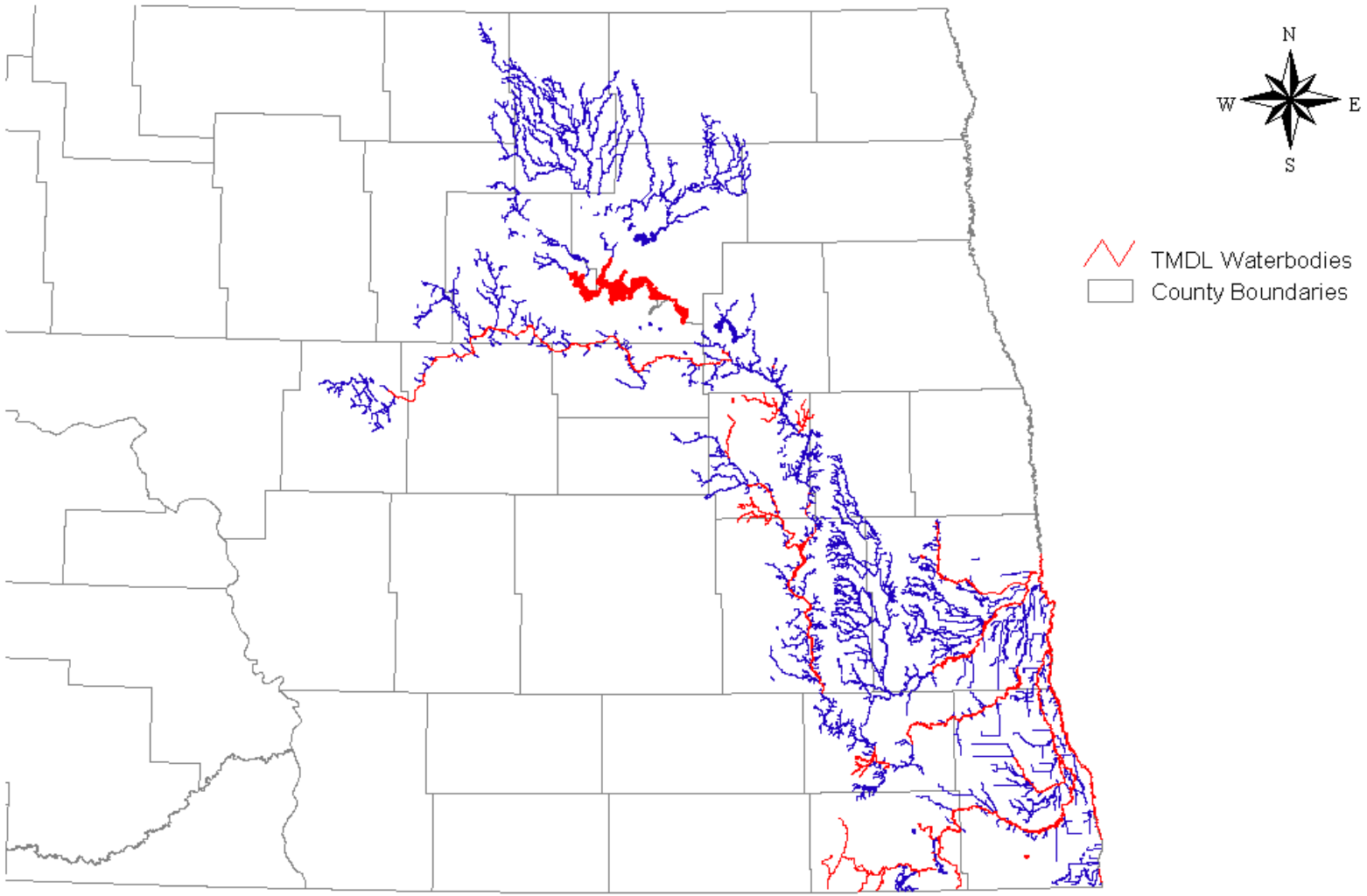

Figure VI-2. Graphical Depiction of 2004 List of Impaired Waters Needing TMDLs in the Upper Red River Basin

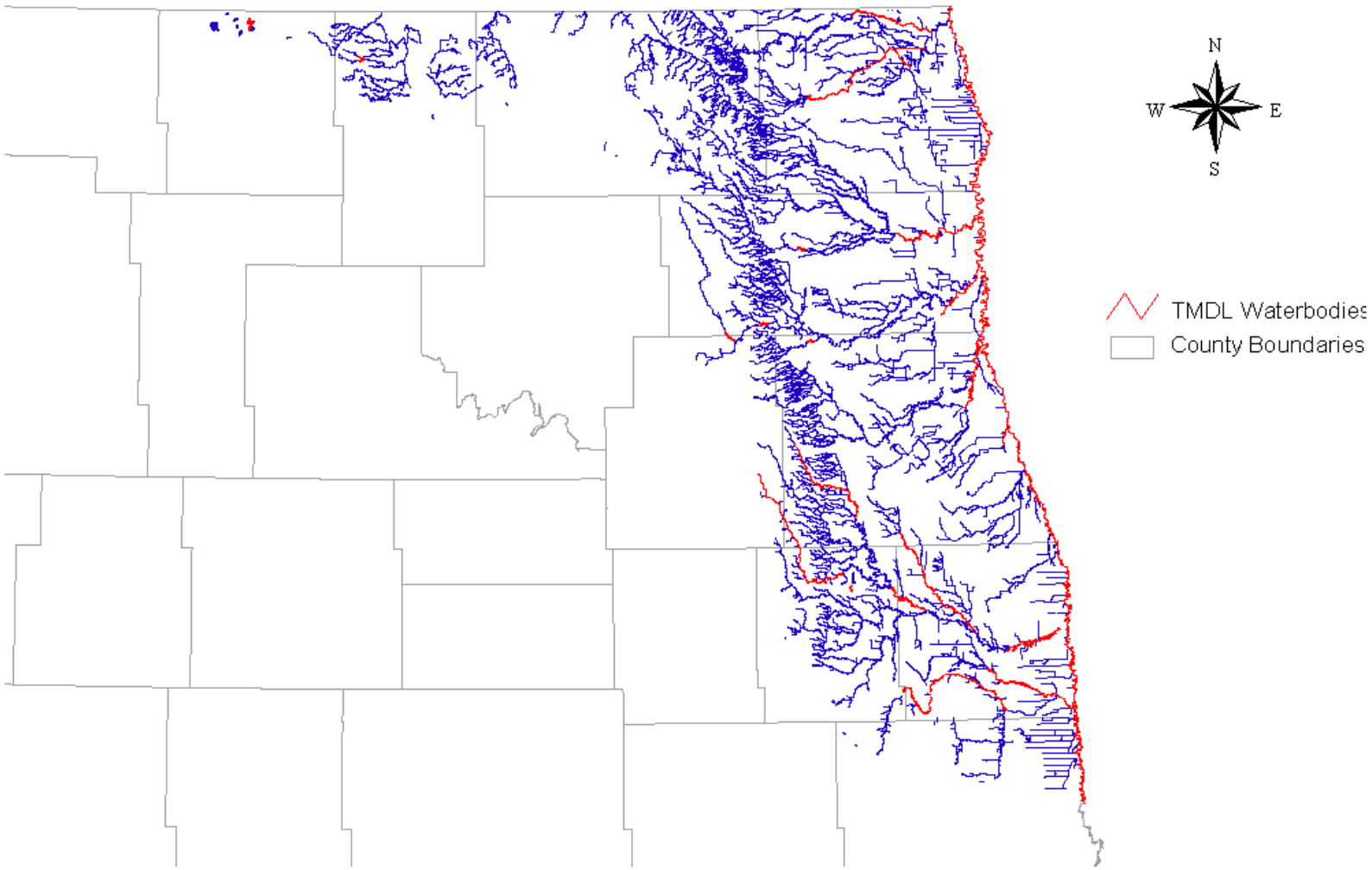

Figure VI-3. Graphical Depiction of 2004 List of Impaired Waters Needing TMDLs in the Lower Red River Basin

Table VI-3. 2004 List of Section 303(d) TMDL Waters for the Missouri River Basin in North Dakota

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-10100004-001-S_00	Yellowstone River from the ND-MT border downstream to its confluence with the Missouri River	21.62 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Trace Metals (e.g., copper, lead, selenium, zinc)	2
					Pesticides (e.g., atrazine, simazine)	2
ND-10110101-001-L_00	Powers Lake	950.6 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrient/Eutrophication	1A
					Oxygen, Dissolved	1A
					Sedimentation/Siltation	1A
			Recreation	Fully Supporting but Threatened	Nutrient/Eutrophication	1A
ND-10110101-013-S_00	Powers Lake watershed	71.97 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1A
ND-10110101-019-L_00	McGregor Dam	54.3 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrient/Eutrophication	1A
					Sedimentation/Siltation	1A
			Recreation	Fully Supporting but Threatened	Nutrient/Eutrophication	1A
ND-10110101-021-L_00	Lake Sakakawea	368,231 acres (based on lake surface area at full pool)	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Oxygen, Dissolved	1B
					Temperature	1B
			Fish Consumption	Not Supporting	Methyl-mercury	3

Table VI-3. 2004 List of Section 303(d) TMDL Waters for the Missouri River Basin in North Dakota

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-10110101-056-S_00	Handy Water Creek, including tributaries	42.41 miles	Fish and Other Aquatic Biota	Not Supporting	Biological Indicators	2
ND-10110101-080-S_00	Little Knife River from Stanley Reservoir downstream to Lake Sakakawea	45.44 miles	Recreation	Not Supporting	Total Fecal Coliform	2
ND-10110201-001-S_00	Little Muddy River from its confluence with East Fork Little Muddy River downstream to Lake Sakakawea	24.0 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-10110102-003-L_00	Blacktail Dam	160 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrient/Eutrophication	1A
					Oxygen, Dissolved	1A
					Sedimentation/Siltation	1A
			Recreation	Fully Supporting but Threatened	Nutrient/Eutrophication	1A
ND-10110203-001-S_00	Little Missouri River from its confluence with Little Beaver Creek downstream to its confluence with Deep Creek	75.79 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-10110205-001-S_00	Little Missouri River from its confluence with Beaver Creek downstream to Highway 85	58.94 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-10110205-033-S_00	Little Missouri River from Highway 85 downstream to its confluence with Cherry Creek	23.79 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-10130101-002-L_00	Brush Lake	200 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrient/Eutrophication	2
					Oxygen, Dissolved	2
			Recreation	Fully Supporting but Threatened	Nutrient/Eutrophication	2
ND-10130101-002-S_00	Square Butte Creek from its confluence with Otter Creek downstream to its confluence with the Missouri River	1.79 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	2
			Recreation	Not Supporting	Total Fecal Coliform	2

Table VI-3. 2004 List of Section 303(d) TMDL Waters for the Missouri River Basin in North Dakota (cont.)

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-10130101-003-L_00	Crooked Lake	375 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrient/Eutrophication	2
				Fully Supporting but Threatened	Oxygen, Dissolved	2
			Recreation	Fully Supporting but Threatened	Nutrient/Eutrophication	2
ND-10130101-004-L_00	Strawberry Lake	140 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrient/Eutrophication	2
					Oxygen, Dissolved	2
			Recreation	Fully Supporting but Threatened	Nutrient/Eutrophication	2
ND-10130101-006-S_00	Unnamed tributaries to Square Butte Creek (ND-10130101-005-S)	97.75 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-10130101-009-S_00	Square Butte Creek from Nelson Lake downstream to its confluence with Otter Creek	38.15 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	2
			Recreation	Not Supporting	Total Fecal Coliform	2
ND-10130103-003-L_00	Braddock Lake	69.5 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrient/Eutrophication	2
					Oxygen, Dissolved	2
					Sedimentation/Siltation	2
			Recreation	Fully Supporting but Threatened	Nutrient/Eutrophication	2
ND-10130103-007-S_00	Hay Creek downstream to its confluence with Apple Creek	15.78 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	1B
ND-10130103-010-L_00	Lake Isabel	805.7 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrient/Eutrophication	2
					Oxygen, Dissolved	2
			Recreation	Fully Supporting but Threatened	Nutrient/Eutrophication	2
ND-10130103-014-L_00	McDowell Dam	55.2 acres	Fish and Other Aquatic Biota	Not Supporting	Oxygen, Dissolved	1A
					Nutrient/Eutrophication	1A
			Recreation	Not Supporting	Nutrient/Eutrophication	1A

Table VI-3. 2004 List of Section 303(d) TMDL Waters for the Missouri River Basin in North Dakota (cont.)

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-10130104-001-L_00	Beaver Lake	953.1 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrient/Eutrophication	2
					Oxygen, Dissolved	2
					Sedimentation/Siltation	2
			Recreation	Fully Supporting but Threatened	Nutrient/Eutrophication	2
ND-10130104-001-S_00	Beaver Creek from its confluence with Sand Creek downstream to Lake Oahe	8.43 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1A
ND-10130104-003-S_00	Beaver Creek from its confluence with Spring Creek downstream to its confluence with Sand Creek	14.9 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1A
ND-10130104-004-S_00	Sand Creek, including tributaries	108.56 miles	Recreation	Not Supporting	Total Fecal Coliform	1A
ND-10130104-005-S_00	Spring Creek, including tributaries	63.14 miles	Recreation	Not Supporting	Total Fecal Coliform	1A
ND-10130104-007-S_00	Beaver Creek from its confluence with the South Branch Beaver Creek downstream to its confluence with Spring Creek	37.68 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1A
ND-10130104-008-S_00	Clear Creek, including tributaries	108.95 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1A
ND-10130104-010-S_00	Beaver Creek from Beaver Lake downstream to its confluence with the South Branch Beaver Creek	38.92 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1A
ND-10130104-012-S_00	Unnamed tributary which is at the south end of Beaver Lake	158.02 miles	Recreation	Not Supporting	Total Fecal Coliform	1A
ND-10130104-014-S_00	South Branch Beaver Creek from its confluence with the South Branch Beaver Creek watershed (ND-10130104-015-S) downstream to its confluence with Beaver Creek	43.45 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1A

Table VI-3. 2004 List of Section 303(d) TMDL Waters for the Missouri River Basin in North Dakota (cont.)

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-10130106-002-L_00	Green Lake	868.6 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrient/Eutrophication	2
					Oxygen, Dissolved	2
			Recreation	Fully Supporting but Threatened	Nutrient/Eutrophication	2
ND-10130106-003-L_00	Lake Hoskins	553.5 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrient/Eutrophication	1A
					Oxygen, Dissolved	1A
			Recreation	Fully Supporting but Threatened	Nutrient/Eutrophication	1A
ND-10130201-002-S_00	Knife River from its confluence with Antelope Creek downstream to its confluence with the Missouri River	19.83 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-10130201-003-S_00	Knife River from its confluence with Spring Creek downstream to its confluence with Antelope Creek	17.83 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-10130201-010-S_00	Otter Creek from its confluence with a tributary watershed (ND-10130201-012-S) downstream to its confluence with the Knife River	18.45 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-10130201-013-S_00	Otter Creek upstream from its confluence with a tributary watershed (ND-10130201-012-S), including tributaries	95.19 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-10130201-014-S_00	Antelope Creek from its confluence with East Branch Antelope Creek watershed (ND-10130201-016-S) downstream to its confluence with the Knife River	8.57 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2

Table VI-3. 2004 List of Section 303(d) TMDL Waters for the Missouri River Basin in North Dakota (cont.)

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-10130201-015-S_00	Unnamed tributaries to Antelope Creek (ND-10130201-014-S)	16.7 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-10130201-016-S_00	East Branch Antelope Creek upstream from Antelope Creek, including tributaries	83.04 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-10130201-017-S_00	Antelope Creek mainstem downstream to its confluence with East Branch Antelope Creek watershed	21.32 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-10130201-035-S_00	Knife River from its confluence with Coyote Creek downstream to its confluence with Spring Creek	14.65 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-10130201-042-S_00	Knife River from its confluence with branch of Knife River downstream to its confluence with Coyote Creek	35.99 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-10130202-001-L_00	Lake Tschida	5018 acres	Recreation	Fully Supporting but Threatened	Nutrient/Eutrophication	2
ND-10130202-004-L_00	Dickinson Dike	22 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrient/Eutrophication	1A
					Oxygen, Dissolved	1A
					Sedimentation/Siltation	1A
			Recreation	Fully Supporting but Threatened	Nutrient/Eutrophication	1A

Table VI-3. 2004 List of Section 303(d) TMDL Waters for the Missouri River Basin in North Dakota (cont.)

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-10130202-050-S_00	Heart River from Patterson Lake downstream to its confluence with the Green River	24.7 miles	Fish and Other Aquatic Biota	Not Supporting	Biological Indicators	2
ND-10130203-002-L_00	Crown Butte Dam	31.2 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrient/Eutrophication	1B
					Oxygen, Dissolved	1B
					Sedimentation/Siltation	1B
			Recreation	Fully Supporting but Threatened	Nutrient/Eutrophication	1B
ND-10130203-005-L_00	Sweetbriar Reservoir	270.6 acres	Recreation	Fully Supporting but Threatened	Nutrient/Eutrophication	1B
ND-10130203-007-L_00	Danzig Dam	147.5 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrient/Eutrophication	2
					Oxygen, Dissolved	2
					Sedimentation/Siltation	2
			Recreation	Fully Supporting but Threatened	Nutrient/Eutrophication	2
ND-10130204-001-L_00	Sheep Creek Dam	84.4 acres	Recreation	Fully Supporting but Threatened	Nutrient/Eutrophication	1B
ND-10130204-001-S_00	Cannonball River from its confluence with Snake Creek downstream to its confluence with Cedar Creek	34.16 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1A
ND-10130204-006-L_00	Indian Creek Dam	222 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrient/Eutrophication	1A
					Oxygen, Dissolved	1A
					Sedimentation/Siltation	1A
			Recreation	Fully Supporting but Threatened	Nutrient/Eutrophication	1A

Table VI-3. 2004 List of Section 303(d) TMDL Waters for the Missouri River Basin in North Dakota (cont.)

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-10130204-014-S_00	Thirtymile Creek from its confluence with Springs Creek downstream to its confluence with the Cannonball River	39.97 miles	Fish and Other Aquatic Biota	Not Supporting	Biological Indicators	2
			Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-10130204-017-S_00	Thirtymile Creek from tributary watershed (ND-10130204-019-S)	19.75 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-10130204-044-S_00	Dead Horse Creek, including tributaries	40.18 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-10130204-047-S_00	Cannonball River from its confluence with White Lake watershed (ND-10130204-049-S) downstream to its confluence with Philbrick Creek	33.25 miles	Recreation	Not Supporting	Total Fecal Coliform	1A
ND-10130204-051-S_00	Philbrick Creek from its confluence with Adobe Wall Creek downstream to its confluence with the Cannonball River	11.7 miles	Recreation	Not Supporting	Total Fecal Coliform	2
ND-10130205-001-S_00	Cedar Creek from its confluence with Hay Creek downstream to its confluence with the Cannonball River	40.3 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-10130205-003-L_00	Cedar Lake	198.5 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrient/Eutrophication	1A
					Oxygen, Dissolved	1A
					Sedimentation/Siltation	1A
			Recreation	Fully Supporting but Threatened	Nutrient/Eutrophication	1A
ND-10130205-006-S_00	Crooked Creek, including tributaries	40.68 miles	Recreation	Not Supporting	Total Fecal Coliform	1A
ND-10130205-012-S_00	Brushy Creek, including tributaries	49.99 miles	Recreation	Not Supporting	Total Fecal Coliform	1A
ND-10130205-017-S_00	Timber Creek from its confluence with Sheep Creek downstream to its confluence with Cedar Creek	23.57 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1A

Table VI-3. 2004 List of Section 303(d) TMDL Waters for the Missouri River Basin in North Dakota (cont.)

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-10130205-021-S_00	Plum Creek, including tributaries	79.34 miles	Recreation	Not Supporting	Total Fecal Coliform	2
ND-10130205-024-S_00	Cedar Creek from its confluence with Chanta Peta Creek downstream to its confluence with Duck Creek	67.56 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-10130205-033-S_00	Cedar Creek from Cedar Lake downstream to its confluence with Chanta Peta Creek	43.06 miles	Fish and Other Aquatic Biota	Not Supporting	Biological Indicators	2
			Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-10130205-042-S_00	Cedar Creek from its confluence with South Fork Cedar Creek downstream to Cedar Lake	30.86 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	1A
ND-10130205-043-S_00	North Fork Cedar Creek, including tributaries	14.5 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	1A
ND-10130205-044-S_00	Unnamed tributaries to Cedar Creek (ND-10130205-042-S)	81.25 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	1A
ND-10130205-045-S_00	South Fork Cedar Creek, including tributaries	21.99 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	1A
ND-10130205-046-S_00	Cedar Creek upstream from its confluence with South Fork Cedar Creek, including tributaries	49.23 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	1A
ND-10130205-047-S_00	North Cedar Creek, including tributaries	115.13 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	1A

Table VI-3. 2004 List of Section 303(d) TMDL Waters for the Missouri River Basin in North Dakota (cont.)

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-10130206-001-S_00	Cannonball River from its confluence with Dogtooth Creek downstream to Lake Oahe	20.83 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-10130206-007-S_00	Cannonball River from its confluence with a tributary watershed near Shields, ND (ND-10130206-028-S) downstream to its confluence with Dogtooth Creek	21.15 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-10130206-027-S_00	Cannonball River from Cedar Creek downstream to a tributary near Shields, ND	23.52 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2

[1] Priority 1A are those AUs for which TMDLs are scheduled for completion in the next two years. Priority 1B are AUs for which TMDL development activities (e.g., monitoring or modeling) are scheduled to begin in the next two years. Priority 2 are those AUs which are scheduled for TMDL development in the next 10 years. AUs listed as Priority 3 are listed as impaired for fish consumption due to methyl-mercury. These AUs are a low priority for the state due to complexities related to the fate and transport of methyl-mercury and due to the interstate and international nature of atmospheric mercury sources. It is the department's recommendation that EPA take the lead in developing mercury TMDLs.

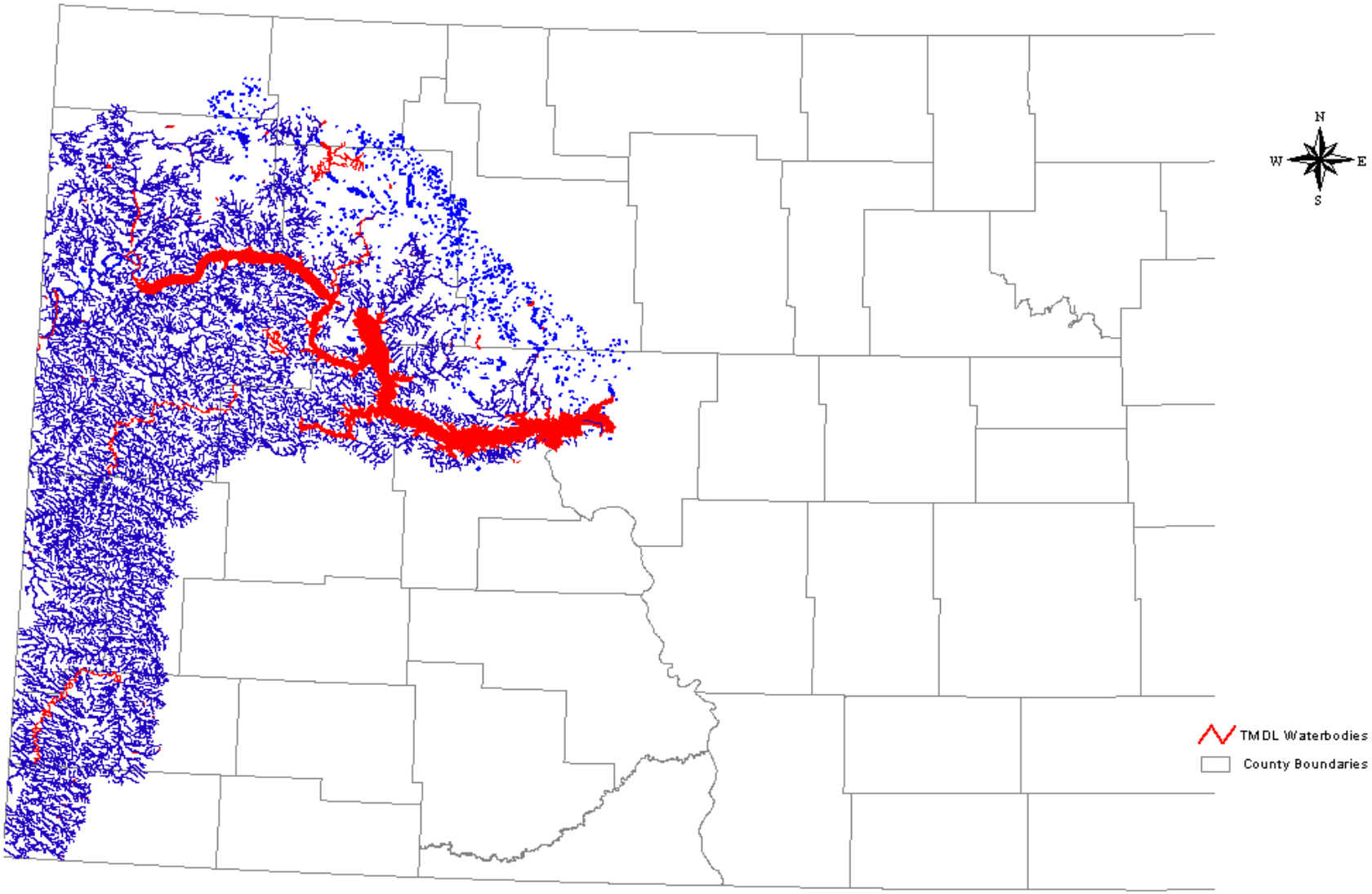

Figure VI-4. Graphical Depiction of 2004 List of Impaired Waters Needing TMDLs in the Lake Sakakawea/Missouri River Basin

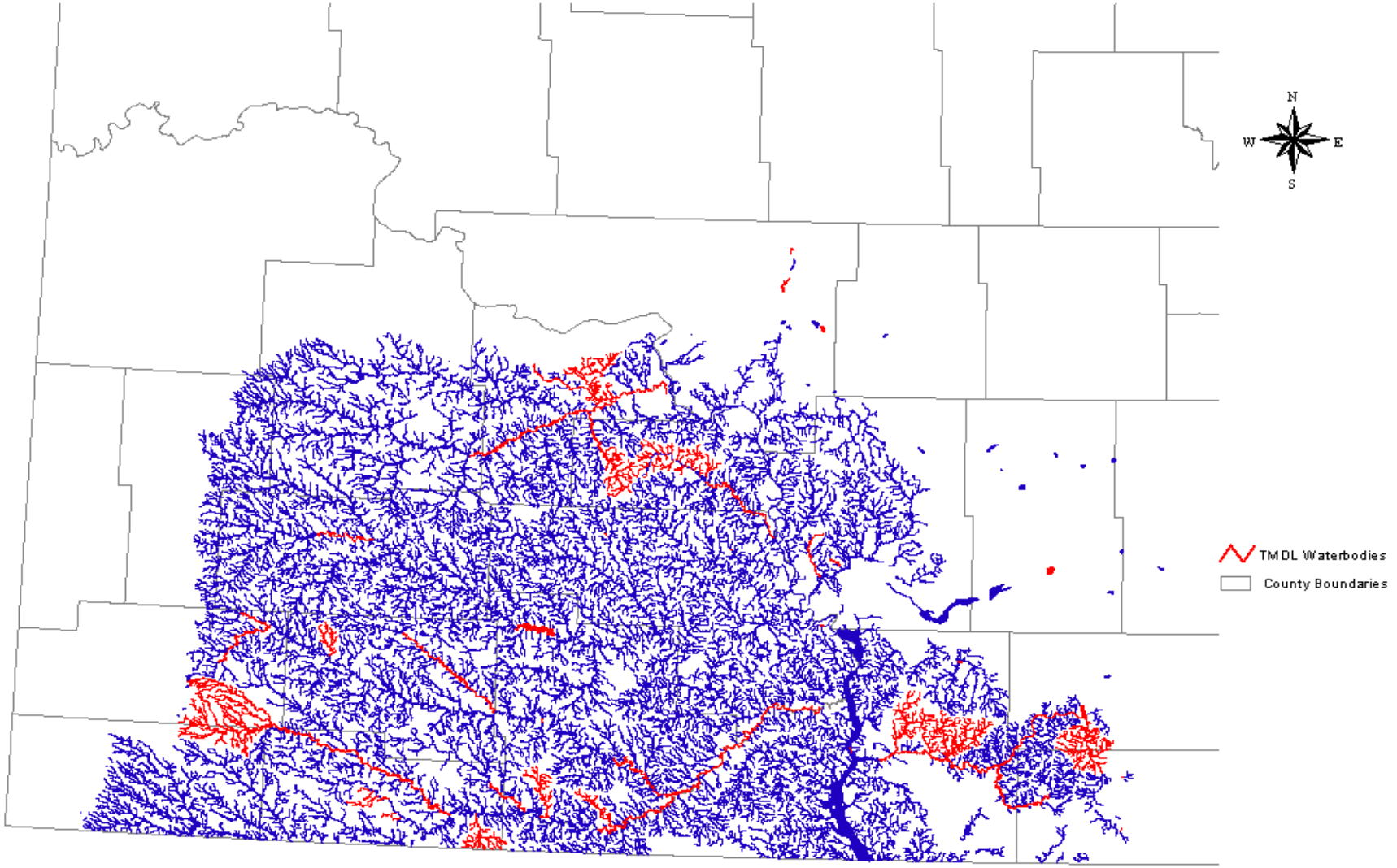

Figure VI-5. Graphical Depiction of 2004 List of Impaired Waters Needing TMDLs in the Lake Oahe/Missouri River Basin

Table VI-4. 2004 List of Section 303(d) TMDL Waters for the James River Basin in North Dakota

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-10160001-002-L_00	Jamestown Reservoir	2086 acres	Recreation	Fully Supporting but Threatened	Nutrient/Eutrophication	2
ND-10160001-002-S_00	James River from Jamestown Reservoir downstream to its confluence with Pipestem Creek	1.48 miles	Fish and Other Aquatic Biota	Not Supporting	Biological Indicators	2
					Oxygen, Dissolved	2
ND-10160001-003-S_00	James River from Arrowwood Lake downstream to Mud Lake	2.98 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Oxygen, Dissolved	2
ND-10160001-013-S_00	James River from its confluence with Big Slough downstream to its confluence with Rocky Run	20.47 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-10160001-021-S_00	Rocky Run downstream to its confluence with a tributary watershed west of Cathay, ND	24.17 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1B
ND-10160001-023-S_00	James River from its confluence with Rocky Run downstream to its confluence with Lake Juanita outlet	21.81 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1B
ND-10160002-001-L_00	Pipestem Reservoir	892 acres	Recreation	Fully Supporting but Threatened	Nutrient/Eutrophication	2
ND-10160002-001-S_00	Pipestem Creek downstream to Sykeston Dam (Lake Hiawatha)	25.21 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1B
ND-10160002-005-S_00	Pipestem Creek from Sykeston Dam downstream to small impoundment near Wells-Foster County line (ND-10160002-006-L)	10.53 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1B
ND-10160002-007-S_00	Pipestem Creek from Pipestem Dam #3 (ND-10160002-006-l) downstream to its confluence with Little Pipestem Creek	7.22 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1B

Table VI-4. 2004 List of Section 303(d) TMDL Waters for the James River Basin in North Dakota (cont.)

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-10160002-008-S_00	Little Pipestem Creek downstream to its confluence with Pipestem Creek	24.26 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1B
ND-10160002-010-S_00	Pipestem Creek from its confluence with Little Pipestem Creek downstream to Pipestem Dam #4 (ND-10160002-006-L)	28.95 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1B
ND-10160002-012-S_00	Unnamed tributary watershed to Pipestem Creek (ND-10160002-013-S)	39.7 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1B
ND-10160002-013-S_00	Pipestem Creek from Pipestem Dam #4 (ND-10160002-006-L) downstream to Pipestem Reservoir	20.52 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1B
ND-10160003-001-S_00	James River from its confluence with Pipestem Creek downstream to its confluence with Sevenmile Coulee	14.41 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Ammonia	1A
					Oxygen, Dissolved	1A
			Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1B
ND-10160003-003-S_00	Cottonwood Creek downstream to Lake LaMoure	66.69 miles	Recreation	Not Supporting	Total Fecal Coliform	1A
ND-10160003-025-S_00	Bone Hill Creek downstream to its confluence with the James River	38.87 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1A
ND-10160003-029-S_00	James River from its confluence with Bone Hill Creek downstream to its confluence with Cottonwood Creek	38.17 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	2
ND-10160003-032-S_00	Bear Creek from tributary watershed (ND-10160003-035-S) downstream to its confluence with the James River	29.34 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1A
ND-10160003-035-S_00	Unnamed tributary watershed to Bear Creek	30.07	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1A
ND-10160001-001-S_00	Elm River from Pheasant Lake downstream to the ND-SD border	5.27 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	1A

Table VI-4. 2004 List of Section 303(d) TMDL Waters for the James River Basin in North Dakota (cont.)

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-10160004-002-S_00	Maple River from its confluence with South Fork Maple River downstream to the ND-SD border	41.07 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1A
			Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	1A
ND-10160004-003-S_00	Weber Gulch, including tributaries	114.75 miles	Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1A
ND-10160004-005-L_00	Pheasant Lake	232.1 acres	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Nutrient/Eutrophication	1A
					Oxygen, Dissolved	1A
					Sedimentation/Siltation	1A
			Recreation	Fully Supporting but Threatened	Nutrient/Eutrophication	1A
ND-10160004-005-S_00	Elm River downstream to Pheasant Lake	13.4 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	1A
ND-10160004-006-S_00	Upper Elm River, including tributaries	14.95 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	1A
ND-10160004-007-S_00	Bristol Gulch, including tributaries	43.45 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	1A
ND-10160004-008-S_00	Unnamed tributaries to Elm River (ND-10160004-005-S)	21.2 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	1A
ND-10160004-009-S_00	Unnamed tributary to Pheasant Lake	2.38 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	1A
ND-10160004-013-S_00	Maple River from its confluence with Maple Creek downstream to its confluence with South Fork Maple River	15.79 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	1A
			Recreation	Fully Supporting but Threatened	Total Fecal Coliform	1A

Table VI-4. 2004 List of Section 303(d) TMDL Waters for the James River Basin in North Dakota (cont.)

Assessment Unit ID	AU Description	AU Size	Designated Use	Use Support	Impairment	TMDL Priority[1]
ND-10160004-015-S_00	South Fork Maple River from its confluence with three tributaries downstream to its confluence with the Maple River	14.53 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	1A
			Recreation	Not Supporting	Total Fecal Coliform	1A
ND-10160004-022-S_00	Maple Creek downstream to its confluence with the Maple River	33.91 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	1A
			Recreation	Not Supporting	Total Fecal Coliform	1A
ND-10160004-026-S_00	Maple River from Schlect-Thom Dam downstream to its confluence with Maple Creek	20.01 miles	Fish and Other Aquatic Biota	Fully Supporting but Threatened	Sedimentation/Siltation	1A

[1] Priority 1A are those AUs for which TMDLs are scheduled for completion in the next two years. Priority 1B are AUs for which TMDL development activities (e.g., monitoring or modeling) are scheduled to begin in the next two years. Priority 2 are those AUs which are scheduled for TMDL development in the next 10 years. AUs listed as Priority 3 are listed as impaired for fish consumption due to methyl-mercury. These AUs are a low priority for the state due to complexities related to the fate and transport of methyl-mercury and due to the interstate and international nature of atmospheric mercury sources. It is the department's recommendation that EPA take the lead in developing mercury TMDLs.

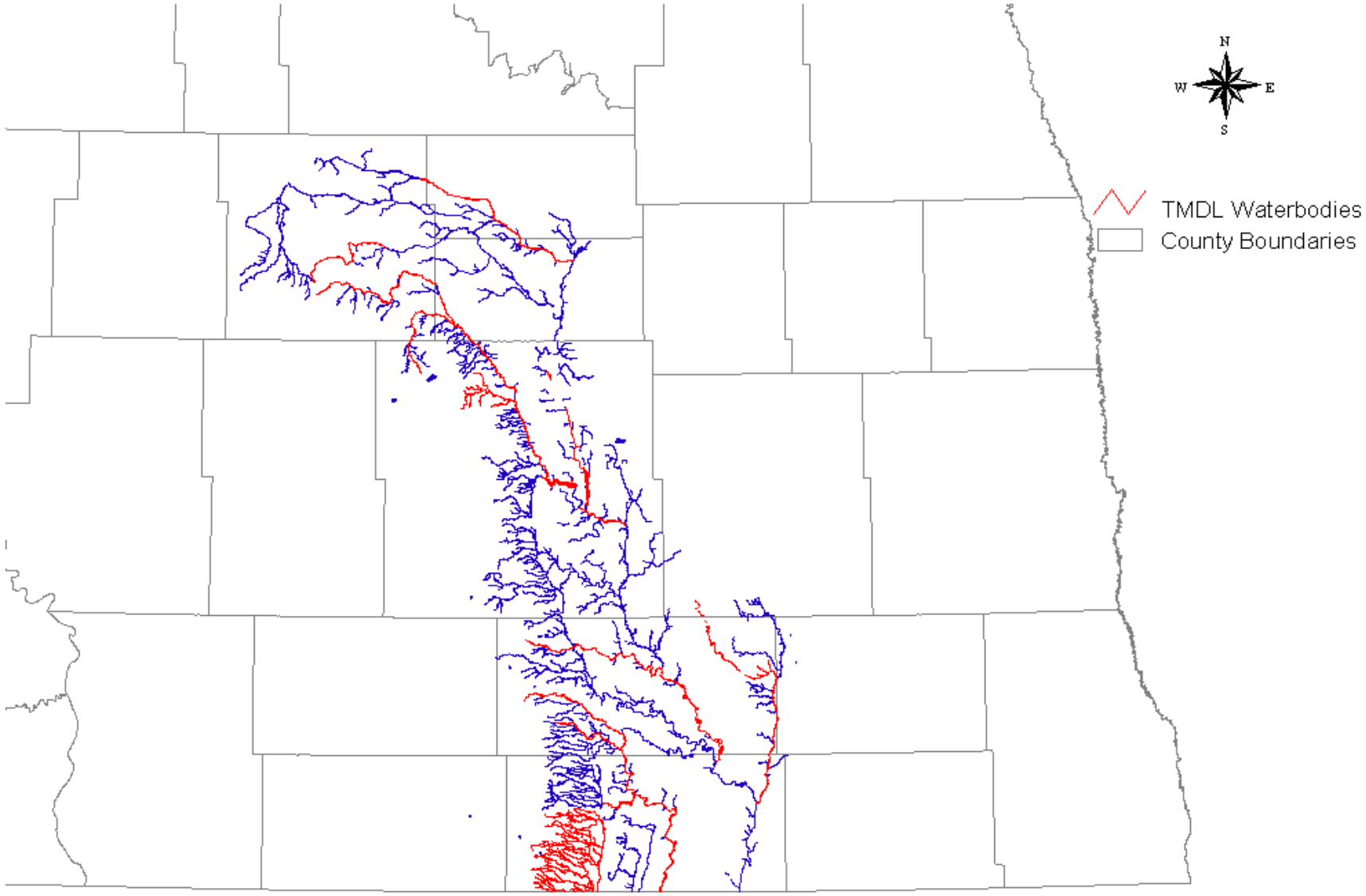

Figure VI-6. Graphical Depiction of 2004 List of Impaired Waters Needing TMDLs in the James River Basin

Table VI-5. 2002 Section 303(d) TMDL Waters in the State Which Have Been De-listed for 2004

Assessment Unit ID/Description	AU Size	Impaired Use	Rationale for De-listing
ND-09010003-001-S_00 Souris River from its confluence with Oak Creek downstream to its confluence with the Wintering River	51.7 miles	Recreation	In 1998, this reach originally was included in a 127.9-mile reach of the Souris River, which was listed for aquatic life and recreation use impairments. In 1998, aquatic life use impairments were listed due to nutrients and sediment, and recreation use impairment was due to bacteria. In 2002, the 127.9-mile reach was listed as two reaches. In addition to this reach, a 76.2-mile reach (ND-09010003-005-S_00) was listed for aquatic life. In 2002, the 76.2-mile reach was de-listed for bacteria. Based on 70 fecal coliform samples, the use assessment criteria shows recreation use is fully supporting.
ND-09020101-002-S_00 Bois De Sioux River from its confluence with the Rabbit River downstream to its confluence with the Ottertail River	15.03 miles	Recreation	Based on 32 fecal coliform samples, the use assessment criteria shows recreation use is fully supporting.
ND-09020107-006-S_00 ND-09020107-008-S_00 Elm River from dam NW of Galesburg, ND downstream to its confluence with the South Branch Elm River	50.39 miles	Fish and Other Aquatic Biota	In 1998, this reach originally was included in a 50.39-mile reach of the Elm River, which was listed as impaired for aquatic life impairment. In the state's 2002 Section 303(d) list, the 50.39-mile reach was divided into two reaches, ND-09020107-006-S and ND-09020107-008-S. The rationale for de-listing these AUs was that the impairment was due to habitat, which is considered a nonpollutant. All rivers and streams listed for nutrient impairments were categorically removed from the 2002 TMDL list due to a lack of scientific justification for a nutrient criteria. Both AUs remain listed in the 2004 list as impaired for aquatic life use due to sediment.

Table VI-5. 2002 Section 303(d) TMDL Waters in the State Which Have Been De-listed for 2004 (cont.)

Assessment Unit ID/Description	AU Size	Impaired Use	Rationale for De-listing
ND-09020202-006-S_00 ND-09020202-004-S_00 ND-09020202-001-S_00 ND-09020203-018-S_00 Sheyenne River from Harvey Dam downstream to Tolna Dam	140.94 miles	Fish and Other Aquatic Biota	In 1998, the Sheyenne River from Harvey Dam to Tolna Dam was listed as impaired for aquatic life due to nutrients, sediment, organic enrichment and habitat. The 1998 listing identified this reach as an 84.36-mile reach of the Sheyenne River. It is actually a 140.94-mile reach. In 2002, four separate AUs representing the 140.94-mile reach were de-listed. The rationale for de-listing assessment units ND-09020202-006-S, ND-09020202-004-S and ND-09020202-001-S was that the impairment was due to habitat, which is considered a nonpollutant. The rationale for de-listing assessment unit ND-09020203-018-S in 2002 was that "based on most recent data, aquatic life use is fully supporting." The rationale for de-listing these AUs for habitat remains valid for 2004 since habitat is considered a nonpollutant. All rivers and streams listed for nutrient impairments were categorically removed from the 2002 TMDL list due to a lack of scientific justification for a nutrient criteria. There are also no water quality data available to support the 1998 listing decisions in which these AUs were listed for organic enrichment. Nutrients and organic enrichment were listed based on best professional judgement. Therefore, these four AUs have been de-listed from the 1998 list for nutrients, organic enrichment and habitat and have been re-listed in 2004 for aquatic life use impairments due to sediment.
ND-09020204-031-S_00 Clausen Springs upstream from Clausen Springs Dam, including tributaries	14.73 miles	Fish and Other Aquatic Biota	In 1998, this AU was listed as impaired for aquatic life use due to habitat, nutrients and sedimentation/siltation. In 2002, the AU was de-listed for habitat, since habitat is not a pollutant, and all rivers and streams listed for nutrient impairments were categorically removed from the 2002 TMDL list due to a lack of scientific justification for a nutrient criteria. It was not de-listed at that time for sediment. However, there is no information or data to suggest that sediment is a cause of impairment to this AU; therefore, for the 2004 list, this AU has been de-listed for sedimentation/siltation. Aquatic life use is still considered impaired due primarily to habitat.

Table VI-5. 2002 Section 303(d) TMDL Waters in the State Which Have Been De-listed for 2004 (cont.)

Assessment Unit ID/Description	AU Size	Impaired Use	Rationale for De-listing
ND-09020205-001-S_00 ND-09020205-010-S_00 ND-09020205-012-S_00 ND-09020205-015-S_00 ND-09020205-021-S_00 ND-09020205-024-S_00 Maple River from its headwaters downstream to its confluence with the Sheyenne River	158.53 miles	Fish and Other Aquatic Biota	In 1998, the Maple River, from its headwaters to its confluence with the Sheyenne River, was listed as impaired for aquatic life due to habitat, sedimentation/siltation and nutrients. In 2002, six separate AUs representing the 158.53-mile reach were de-listed. The rationale for de-listing these AUs was that the impairment was due to habitat, which is considered a nonpollutant. All rivers and streams listed for nutrient impairments were categorically removed from the 2002 TMDL list due to a lack of scientific justification for a nutrient criteria. While the 2002 TMDL list did not include these AUs, they were not de-listed for sediment. Based on macroinvertebrate IBI scores and the resulting biological condition assessments conducted for the 2004 TMDL list, AUs ND-09020205-001-S and ND-09020205-010 have been assessed as not supporting aquatic life use. Therefore, these two AUs have been re-listed in 2004 as impaired for aquatic life use due to sediment using biological indicators. There are currently no water quality data available to support the 1998 listing decisions in which these AUs were listed for the pollutants nutrients and sediment. These pollutants were listed in 1998 based on best professional judgement. There are also no water quality data to support the 1998 listings of AUs ND-09020205-012-S and ND-09020205-015-S for sediment; therefore, these two AUs have been de-listed for the 2004 TMDL list. Based on a lack of sufficient credible data, the 2002 de-listing decisions for AUs ND-09020205-021-S and ND-09020205-024-S remain valid for the 2004 report.

Table VI-5. 2002 Section 303(d) TMDL Waters in the State Which Have Been De-listed for 2004 (cont.)

Assessment Unit ID/Description	AU Size	Impaired Use	Rationale for De-listing
ND-09020301-002-S_00 ND-09020301-005-S_00 ND-09020301-006-S_00 English Coulee from its headwaters downstream to its confluence with the Red River of the North	20.55 miles	Fish and Other Aquatic Biota Recreation	English Coulee is an intermittent stream that originates southwest of Grand Forks and flows through the city of Grand Forks to the Red River. In the headwater portion of the watershed, English Coulee has been dammed and channelized for flood protection. In the lower portion of its watershed, it has been channelized and dredged. It also receives significant stormwater contributions from the city of Grand Forks. In 1998, English Coulee, from its headwaters to the Red River, was listed as impaired for both aquatic life and recreation. Impairments to aquatic life identified in the 1998 list were nutrients, sediment, total dissolved solids, habitat degradation, flow alteration, exotic plants and organic enrichment. Impairments to recreation identified in the 1998 list were nutrients and sediment. In 2002, rationale was provided to de-list the upper 8.86-mile reach (ND-09020301-006-S) for both aquatic life and recreation use impairments. Rationale provided in 2002 for de-listing ND-09020301-006-S was a lack of credible data and/or information to make a use support determination. Rationale also was provided to de-list the middle 6.16-mile reach for recreation use impairment. A lack of credible data and/or information also was cited as the reason for this de-listing decision. The lower 5.53-mile reach remained listed for both aquatic life and recreation use impairments. In 2002, sediment was listed as the impairment for aquatic life use and total fecal coliform for recreation. Pollutants such nutrients, TDS and organic enrichment were not listed as impairments for aquatic life use in 2002. Nutrients and sediment were also not listed as an impairment cause for recreation in 2002. For this TMDL list, the department continues to support its decision to de-list the upper reach of English Coulee (ND_09020301-006-S) for aquatic life and recreation use impairments due to the pollutants listed in 1998 (i.e., nutrients, sediment, TDS and organic enrichment). This decision is based on a continued lack of credible data linking the beneficial use impairment to these pollutants. The department continues to recognize this reach as not supporting aquatic life use, but the impairments listed are nonpollutants (habitat degradation, flow alteration). For this TMDL list, the department also continues to support its decision in 2002 to de-list the middle reach of English Coulee (ND-09020301-005-S) for recreation use impairments. While this reach continued to be listed in 2002 for aquatic life use impairment due to sediment, the department is de-listing this reach for aquatic life use impairment in 2004. The rationale for de-listing this reach is the same as that for the upper reach. There continues to be a lack of credible data linking the beneficial use impairment to these pollutants. Again, the department will continue to recognize this reach as not supporting aquatic life use, but the impairments listed are nonpollutants (habitat degradation and flow alteration). Due to the known pollutant sources (i.e., stormwater runoff) to the lower reach (ND-09020301-002-S) and their effects on both aquatic life and recreation uses, this reach continues to be listed as impaired. Pollutants listed for aquatic life and recreation uses are those listed in both 1998 and 2002, with the exception of nutrients. For aquatic life, these are sediment, TDS and organic enrichment. For recreation, they are sediment and total fecal coliform. The rationale to de-list this AU as impaired for both aquatic life and recreation use due to nutrients has been made since all rivers and streams listed for nutrient impairments were categorically removed from the 2002 TMDL list due to a lack of scientific justification for a nutrient criteria

Table VI-5. 2002 Section 303(d) TMDL Waters in the State Which Have Been De-listed for 2004 (cont.)

Assessment Unit ID/Description	AU Size	Impaired Use	Rationale for De-listing
ND-09020307-001-S_00 ND-09020307-006-S_00 ND-09020307-019-S_00 Turtle River from its confluence with a tributary NE of Turtle River State Park downstream to its confluence with the Red River of the North	56.28 miles	Fish and Other Aquatic Biota	In 1998, the Turtle River from Turtle River State Park downstream to the Red River was listed as impaired for aquatic life use. Impairment causes identified in the 1998 listing were sediment, TDS, metals and habitat degradation. In 2002, the two upstream reaches (ND-09020307-006 representing 0.65 miles and ND-09020307-019 representing 25.27 miles) were de-listed. The rationale provided in 2002 for de-listing was that "based on most recent data, use is fully supporting." Based on macroinvertebrate IBI scores and the resulting biological condition assessments conducted for the 2004 TMDL list, the upper reach, ND-09020207-019-S, is assessed as fully supporting aquatic life use. This additional data supports the 2002 assessment decision to de-list the upper reach, ND-09020307-019-S. In 2002, the lower reach was listed as impaired for aquatic life use. Impairment causes listed in 2002 were metals, specifically cadmium and selenium, and sediment. TDS was not listed as an impairment cause in 2002. For the 2004 TMDL list, the lower reach again has been listed as impaired, with TDS included in the list of impairments. The middle reach has been re-listed. This reach is immediately below Kelly Slough, a suspected source of the impairment causes to the lower reach.
ND-09020308-001-S_00 Forest River from Lake Ardoch downstream to the Red River of the North	16.17 miles	Fish and Other Aquatic Biota Recreation	In 1998, this AU was listed as impaired for aquatic life and recreation. Causes of aquatic life use impairments listed in 1998 were nutrients, sediment, TDS, habitat and flow alteration. Fecal coliform bacteria was identified as the pollutant causing recreation use impairment. In 2002, this AU again was listed as impaired for aquatic life use. Sediment was the only pollutant listed as the cause of impairment in 2002. All rivers and streams listed for nutrient impairments were categorically removed from the 2002 TMDL list due to a lack of scientific justification for a nutrient criteria. While TDS was listed as a pollutant-causing impairment in 1998, it was not listed in 2002. It was also not de-listed as an impairment in 2002. Since Lake Ardoch is still believed to be a source of TDS loading to the lower Forest River, this pollutant has been listed as a pollutant in 2004. The aquatic life use support decision also is supported by the recently completed macroinvertebrate IBI and biological condition assessment for this AU. There are, however, no data to support the 1998 decision to assess recreation use as impaired due to fecal coliform bacteria. An analysis of all readily available and existing data for this reach did not yield any bacteria data. It is assumed that the assessment made in 1998 was based on best professional judgement. Therefore, the decision to de-list this AU in 2002 is still valid.

Table VI-5. 2002 Section 303(d) TMDL Waters in the State Which Have Been De-listed for 2004 (cont.)

Assessment Unit ID/Description	AU Size	Impaired Use	Rationale for De-listing
ND-09020310-001-S_00 ND-09020310-010-S_00 ND-09020310-013-S_00 Park River from its confluence with the South Branch Park River downstream to the Red River of the North	36.57 miles	Fish and Other Aquatic Biota	In 1998, these AUs were listed collectively as one waterbody and assessed as impaired for aquatic life use. Causes of use impairment listed in 1998 were nutrients, sediment, TDS, metals, organic enrichment and habitat degradation. In 2002, these three AUs were listed individually as impaired for aquatic life use. The only pollutant listed as a cause of impairment in 2002 was sediment. While nutrients were categorically de-listed as a cause of impairment to rivers and streams due to a lack of scientific justification for a nutrient criteria, TDS, metals and organic enrichment were not de-listed. Habitat degradation is considered a nonpollutant and, as such, is not included in the list of impairments to TMDL-listed waters. For purposes of the 2004 TMDL list, the pollutants TDS and organic enrichment, excluded from the 2002 list, have been included in the 2004 list. There are, however, no water quality monitoring data to suggest any trace metal is exceeding water quality standards for these three reaches. Therefore, metals has been de-listed from the 2004 TMDL list for these AUs.
ND-09020313-006-S_00 ND-09020313-009-S_00 Tongue River from Renwick Dam downstream to its confluence with Big Slough	38.45 miles	Fish and Other Aquatic Biota	In 1998, these AUs were listed collectively as one waterbody and assessed as impaired for aquatic life use. Causes of use impairment listed in 1998 were sediment and habitat degradation. In 2002, these two AUs were de-listed for the nonpollutant habitat degradation and were not listed in the 2002 TMDL list. They were not de-listed for sediment. For purposes of the 2004 TMDL list, assessment unit ND-09020313-006-S has been re-listed for aquatic life use impairment due to biological indicators and sediment, and assessment unit ND-09020313-009-S has been re-listed as impaired for aquatic life use due to sediment. The decision to re-list ND-09020313-009-S was made despite macroinvertebrate IBI scores for this AU in the "good" rating, suggesting a fully supporting use assessment.
ND-09020313-021-S_00 Pembina River from its confluence with a tributary west of Neche, ND downstream to its confluence with the Tongue River	32.72 miles	Fish and Other Aquatic Biota Recreation	In 1998, this AU was listed as impaired for aquatic life and recreation. Aquatic life use impairments listed in 1998 were nutrients, sediment and habitat degradation. In 2002, all rivers and streams listed for nutrient impairments, including this AU, were categorically removed from the 2002 TMDL list due to a lack of scientific justification for a nutrient criteria. In 2002, this AU was de-listed for the nonpollutant habitat degradation and was not listed in the 2002 TMDL list. It was not de-listed for sediment. In 2002, this AU was also de-listed for the recreation use impairment. At that time, available data supported a fully supporting use assessment. For purposes of the 2004 TMDL list, assessment unit ND-09020313-021-S has been re-listed for recreation use impairment due to total fecal coliform and for aquatic life use impairment due to sediment. The decision to re-list ND-09020313-021-S is made despite macroinvertebrate IBI scores for this AU in the "good" rating, suggesting a fully supporting use assessment.

Table VI-5. 2002 Section 303(d) TMDL Waters in the State Which Have Been De-listed for 2004 (cont.)

Assessment Unit ID/Description	AU Size	Impaired Use	Rationale for De-listing
ND-10110101-012-L_00 Rice Lake	185.5 acres	Fish and Other Aquatic Biota Recreation	A TMDL (TMDL Tracking System ID 9808) to address phosphorus loading for this waterbody was completed and approved by EPA Feb. 6, 2004. For purposes of 303(d) reporting, this waterbody is considered impaired for aquatic life and recreation use but is considered a category 4A, since a TMDL has been completed and approved. While the approved TMDL for this waterbody is for phosphorus, attainment of the TMDL targets for phosphorus (and nitrogen) will result in an improved trophic status and attainment of the dissolved oxygen standard. In 1998, this waterbody also was listed as impaired for aquatic life use due to sediment. This waterbody is being de-listed for sediment. The assessment data collected for TMDL development did not support sediment as a cause of impairment.
ND-10110203-025-S_00 ND-10110203-057-S_00 Little Missouri River from its confluence with Deep Creek downstream to its confluence with Government Creek	58.14 miles	Fish and Other Aquatic Biota Recreation	In 1998, these two AUs were listed collectively as impaired for aquatic life and recreation. Causes of aquatic life use impairments listed in 1998 were nutrients and metals. Fecal coliform bacteria was identified as the pollutant causing recreation use impairment. In 2002, these two AUs were de-listed individually for aquatic life impairment. All rivers and streams listed for nutrient impairments were categorically removed from the 2002 TMDL list due to a lack of scientific justification for a nutrient criteria. The rationale for de-listing these two AUs for the metals impairment included an analysis of dissolved metals data intensively collected in 1999 that showed no exceedances of acute or chronic water quality criteria. The decision to de-list these two AUs also is supported by results of the recently completed macroinvertebrate IBI and biological condition assessment. Macroinvertebrate IBI scores for ND-10110203-025-S are in the "good" rating, suggesting a fully supporting use assessment. These two AUs remained listed on the 2002 list for recreation use impairment. However, based on 48 fecal coliform samples collected from sites near the downstream extent of ND-10110203-025-S and the upstream extent of ND-10110203-057-S, the use assessment criteria shows recreation use is fully supporting; therefore, these two AUs have been de-listed from the 2004 TMDL list.
ND-10110205-001-S_00 ND-10110205-033-S_00 ND-10110205-059-S_00 Little Missouri River from its confluence with Beaver Creek downstream to Little Missouri Bay, Lake Sakakawea	103.76 miles	Fish and Other Aquatic Biota Recreation	In 1998, these three AUs were listed collectively as impaired for aquatic life and recreation. Causes of aquatic life use impairments listed in 1998 were habitat and metals. Fecal coliform bacteria was identified as the pollutant causing recreation use impairment. In 2002, these three AUs were de-listed individually for aquatic life impairment. The rationale for de-listing these three AUs for the metals impairment included an analysis of dissolved metals data intensively collected in 1999 that showed no exceedances of acute or chronic water quality criteria. These three AUs also were de-listed in 2002 for the nonpollutant habitat degradation. The upper 58.94-mile reach (ND-10110205-001-S) and the middle 23.79-mile reach (ND-10110205-033-S) remained listed on the 2002 list for recreation use impairment. The assessment is based on 48 fecal coliform samples collected from sites near the downstream extent of ND-10110205-001-S and the upstream extent of ND-10110205-033-S. Data from this site support a recreation use support decision as fully supporting, but threatened. The downstream reach (ND-10110205-059-S) was de-listed from the 2002 TMDL list based on a lack of sufficient credible data. The assessment decision to list this AU in 1998 was based on data extrapolated from a site more than 25 miles upstream of the reach.

Table VI-5. 2002 Section 303(d) TMDL Waters in the State Which Have Been De-listed for 2004 (cont.)

Assessment Unit ID/Description	AU Size	Impaired Use	Rationale for De-listing
ND-10130101-002-S_00 ND-10130101-009-S_00 Square Butte Creek from Nelson Lake downstream to its confluence with the Missouri River	39.94 miles	Fish and Other Aquatic Biota	In 1998, these two AUs were listed collectively as impaired for aquatic life. Aquatic life use impairments listed in 1998 were nutrients, sediment, flow alteration and habitat degradation. In 2002, all rivers and streams listed for nutrient impairments, including these two AUs, were categorically removed from the 2002 TMDL list due to a lack of scientific justification for a nutrient criteria. In 2002, these AUs were also de-listed for the nonpollutants flow alteration and habitat degradation. These two AUs were not de-listed for sediment in 2002 but have been re-listed in the 2004 list as impaired for aquatic life use due to sediment. The decision to re-list AU ND-10130101-009-S was made despite results from the recently completed IBI for macroinvertebrates and IBI assessments for two sites sampled in this reach showing a "good" condition rating.
ND-10130201-001-S_00 Spring Creek from its confluence with Goodman Creek downstream to its confluence with the Knife River	28.56 miles	Recreation	Based on 53 fecal coliform samples, the use assessment criteria shows recreation use is fully supporting.
ND-10130201-037-S_00 Coyote Creek from its confluence with Beaver Creek downstream to its confluence with the Knife River	17.24	Recreation	Based on 33 fecal coliform samples, the use assessment criteria shows recreation use is fully supporting.
ND-10130202-002-L_00 Patterson Lake	1,191 acres	Fish and Other Aquatic Biota Recreation	A TMDL (TMDL Tracking System ID 9809) to address phosphorus and sediment loading for this waterbody was completed and approved by EPA Feb. 6, 2004. For purposes of 303(d) reporting, this waterbody is considered impaired for aquatic life and recreation use but is considered a category 4A, since TMDLs for phosphorus and sediment/turbidity have been completed and approved. While the approved TMDL for this waterbody is for phosphorus, attainment of the TMDL targets for phosphorus (and nitrogen) will result in an improved trophic status and attainment of the dissolved oxygen standard.
ND-10130202-003-S_00 Heart River from its confluence with South Branch Heart River downstream to Patterson Lake	15.49 miles	Fish and Other Aquatic Biota	A TMDL (TMDL Tracking System ID 9811) to address phosphorus and sediment loading for this waterbody was completed and approved by EPA Feb. 6, 2004. For purposes of 303(d) reporting, this waterbody is considered impaired for aquatic life but is considered a category 4A, since TMDLs for phosphorus and sediment have been completed and approved. While the approved TMDL for this waterbody is for phosphorus and sediment, attainment of the TMDL targets for phosphorus (and nitrogen) also should result in a reduction in primary production and in organic enrichment.

Table VI-5. 2002 Section 303(d) TMDL Waters in the State Which Have Been De-listed for 2004 (cont.)

Assessment Unit ID/Description	AU Size	Impaired Use	Rationale for De-listing
ND-10130202-056-S_00 Heart River from its confluence with a tributary near Belfield downstream to its confluence with South Branch Heart River	14.88 miles	Fish and Other Aquatic Biota	A TMDL (TMDL Tracking System ID 9810) to address phosphorus and sediment loading for this waterbody was completed and approved by EPA Feb. 6, 2004. For purposes of 303(d) reporting, this waterbody is considered impaired for aquatic life but is considered a category 4A, since TMDLs for phosphorus and sediment have been completed and approved. While the approved TMDL for this waterbody is for phosphorus and sediment, attainment of the TMDL targets for phosphorus (and nitrogen) also should result in a reduction in primary production and organic enrichment.
ND-10130202-057-S_00 South Branch Heart River downstream to its confluence with the Heart River	12.75 miles	Fish and Other Aquatic Biota	A TMDL (TMDL Tracking System ID 9812) to address sediment loading for this waterbody was completed and approved by EPA Feb. 6, 2004. For purposes of 303(d) reporting, this waterbody is considered impaired for aquatic life but is considered a category 4A, since a TMDL sediment has been completed and approved.
ND-10130205-042-S_00 ND-10130205-043-S_00 ND-10130205-044-S_00 ND-10130205-045-S_00 ND-10130205-046-S_00 ND-10130205-047-S_00 Cedar Lake watershed (Cedar Creek upstream from Cedar Lake, including South Fork Cedar Creek and North Fork Cedar Creek and their tributaries)	312.96 miles	Fish and Other Aquatic Biota	In 1998, these six AUs were listed collectively as impaired for aquatic life and recreation. Causes of aquatic life use impairments listed in 1998 were nutrients, sediment, salinity and habitat. Fecal coliform bacteria was identified as the pollutant causing recreation use impairment. In 2002, all rivers and streams listed for nutrient impairments, including these six AUs, were categorically removed from the 2002 TMDL list due to a lack of scientific justification for a nutrient criteria. In 2002, these AUs also were de-listed for the nonpollutant habitat degradation. Also lacking is sufficient credible data to list salinity as an impairment. This listing was due to best professional judgement and lacks data supporting a link between salinity concentrations in the watershed and effects on the biological community. All six AUs in the Cedar Lake watershed will remain listed as impaired (fully supporting, but threatened) for aquatic life use due to sediment. All six AUs will remain de-listed for nutrients, salinity and habitat.
		Recreation	Based on fecal coliform samples collected from two sites in the watershed, one site located on the North Fork Cedar Creek and one located on Cedar Creek just upstream from Cedar Lake, the use assessment criteria shows recreation use as fully supporting. This assessment is based on 92 and 179 samples from the two sites, respectively. Since it is reasonable to assume that these results represent conditions upstream in the other four AUs, six AUs have been de-listed for recreation use impairment.
ND-10160001-002-L_00 Jamestown Reservoir	2,086 acres	Fish and Other Aquatic Biota	Water quality data collected in 1998 and the resulting trophic status assessment for Jamestown Reservoir show aquatic life use as fully supporting. Frequent algal blooms in the summer due to nutrients/eutrophication support the continued recreation use assessment as fully supporting, but threatened.

Table VI-5. 2002 Section 303(d) TMDL Waters in the State Which Have Been De-listed for 2004 (cont.)

Assessment Unit ID/Description	AU Size	Impaired Use	Rationale for De-listing
ND-10160004-026-S_00 Maple River from Schlect-Thom Dam downstream to its confluence with Maple Creek	20.01 miles	Recreation	Based on 74 fecal coliform samples, the use assessment criteria shows recreation use is fully supporting.

F. TMDL Development and Monitoring Schedule

The responsibility for TMDL development in North Dakota lies primarily with the department's Division of Water Quality Surface Water Quality Management Program. TMDL development staff are located in three regional field offices in Dickinson, Fargo and Towner, N. D. Technical support for TMDL development projects and overall program coordination are provided by Surface Water Quality Management Program staff located in Bismarck, N. D.

Historically, the technical and financial resources necessary to complete the state's TMDL development priorities have hampered the pace of TMDL development in the state. Recently, however, the state's TMDL program has seen an improvement in the financial resources available for TMDL development projects. While still significantly short of the funding necessary to meet the state's TMDL development schedule, EPA and the state of North Dakota have made available additional grants and funding to complete TMDLs. Examples of these new financial resources include the TMDL development grant available through EPA Regional VIII and state funding through the North Dakota Game and Fish Department's Save Our Lakes Program.

With the continued commitment to adequate TMDL development staffing and with a continuation in the growth of funding for TMDL development projects in the state, the department is confident it will meet its TMDL development schedule.

The 2004 Section 303(3)(d) TMDL list for North Dakota has identified 65 waterbodies or 109 waterbody/pollutant combinations for TMDL completion in the next two years. These Priority 1A waterbodies are AUs for which the monitoring is either completed or near completion. The 2004 TMDL list also has targeted 32 waterbodies or 57 Priority 1B waterbody/pollutant combinations. These are waterbodies for which TMDL monitoring activities are scheduled to start in the next two years. These Priority 1A and 1B waterbody/pollutant combinations represent more than 48 percent of all the Priority 1A, 1B and 2 waterbody/pollutant combinations on the list. Based on an anticipated TMDL completion schedule of 22 additional waterbody/pollutant combinations per year following 2006, the department expects to complete TMDLs for all 2004 listed Priority 1A, 1B and 2 waters in 10 years.

Other Monitoring Activities

In addition to this schedule for TMDL development monitoring, the department will maintain its network of 33 fixed-station chemical monitoring sites and its commitment to the Environmental Monitoring and Assessment Program (EMAP)-Western Pilot Project and the EMAP Great River Ecosystems Project. The department also will resume its rotating basin biological monitoring program in the Red River Basin in 2005. The following is a brief description of each of these monitoring activities.

> **Fixed Station Chemical Monitoring Network** – Since 1994, the department has operated a network of 26 to 33 ambient monitoring sites. Where practical, sites are co-located with USGS flow gauging stations, thereby facilitating the analysis of chemical

data with stream hydrologic data. All of these sites are established as basin or subbasin integrator sites, where the chemical character measured at each of these sites reflects water quality effects in the entire watershed. It is the department's intention to maintain these as long-term monitoring sites for the purpose of assessing water quality trends and to describe the general chemical character of the state's major river basins. Sites scheduled for sampling in 2004, 2005 and 2006 as part of the department's ambient monitoring network are shown in Table VI-6 and Figure VI-7.

Table VI-6. 2004-2006 Ambient Water Quality Monitoring Sites

Station ID	River	Location
380161	Souris River	above Minot
380021	Des Lacs River	at Foxholm
380095	Souris River	at Verendrye
385055	Bois de Sioux	near Doran, MN
380083	Red River	at Brushville, MN
380031	Wild Rice River	near Abercrombie
385040	Red River	near Harwood
380010	Sheyenne River	at Warwick
380009	Sheyenne River	3 mi E of Cooperstown
380153	Sheyenne River	below Baldhill Dam
380007	Sheyenne River	at Lisbon
385001	Sheyenne River	near Kindred
384155	Maple River	at Mapleton
380156	Goose River	at Hillsboro
384156	Red River	at Grand Forks
380037	Turtle River	at Manvel
380039	Forest River	at Minto
380157	Park River	at Grafton
380158	Pembina River	at Neche
384157	Red River	at Pembina
384130	James River	at Grace City
380013	James River	at Jamestown
380012	James River	at LaMoure
380022	Little Missouri River	at Medora
380059	Little Missouri River	S of Watford City on Hwy 85 bridge
384131	Knife River	near Golden Valley
380060	Spring Creek	at Zap
380087	Knife River	at Hazen
380160	Heart River	above Lake Tschida
380151	Heart River	near Mandan
380077	Cedar Creek	at Raleigh
380105	Cannonball River	near Raleigh
380067	Cannonball River	S of Breien

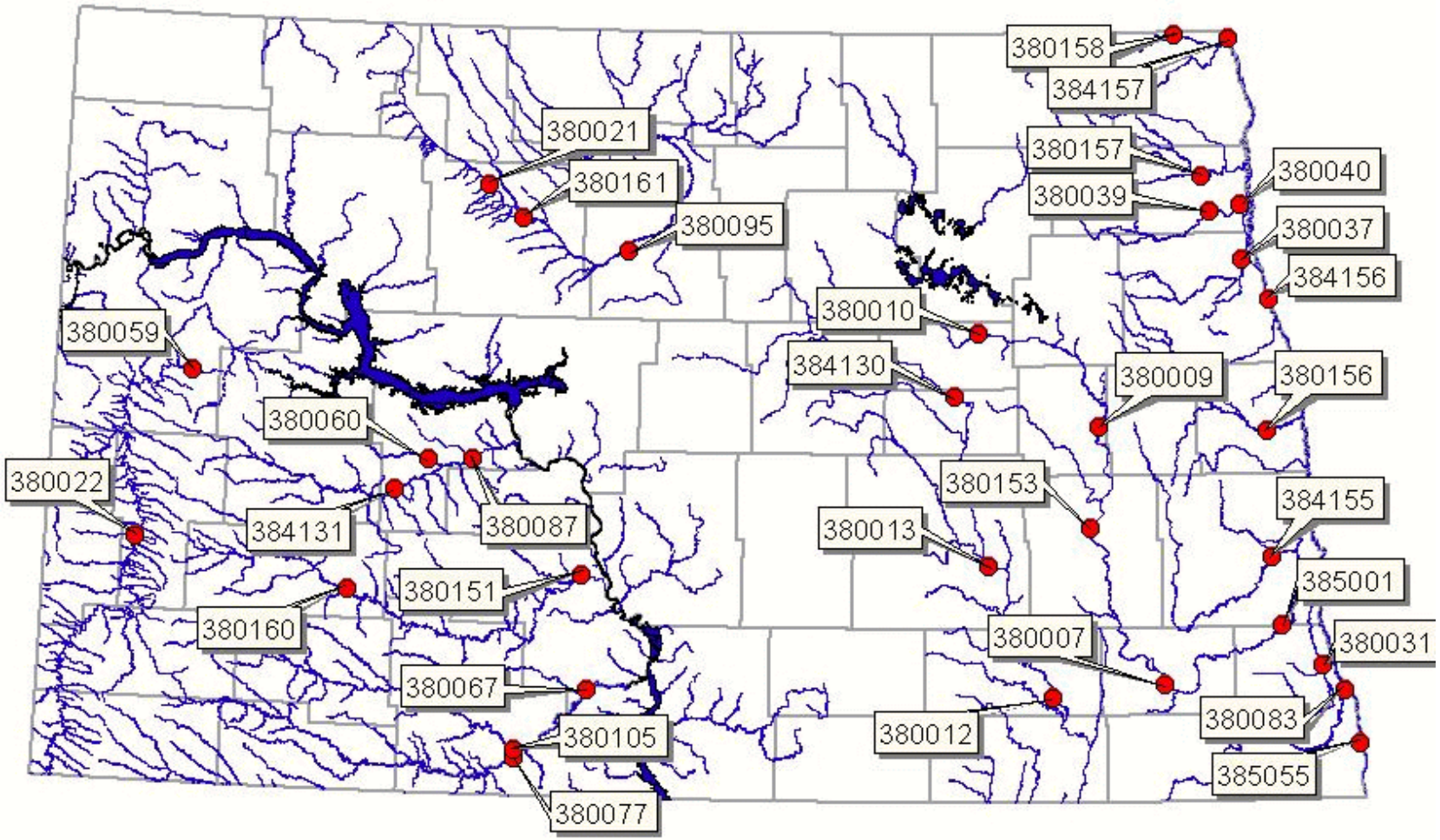

Figure VI-7. 2004-2006 Ambient Water Quality Monitoring Sites

EMAP Western Pilot Project – The U.S. EPA Environmental Monitoring and Assessment Program (EMAP) Western Pilot Project is the second regional pilot project within EMAP focusing on multiple resources. The first of these regional pilot projects focused on the mid-Atlantic region (Maryland, Delaware, Pennsylvania, Virginia and West Virginia). The Western Pilot is a five-year effort (2000-2004) targeted for the western conterminous United States. The pilot involves three EPA Regions (VIII, IX and X) and 12 states (North Dakota, South Dakota, Montana, Wyoming, Colorado, Utah, Arizona, Nevada, California, Washington and Oregon). The pilot has three main resource components: surface waters (rivers and streams), landscapes and near coastal (estuaries and coastal waters).

North Dakota is part of the Western Pilot's Surface Water Project. The stated purpose of this part of the pilot is (1) to develop the monitoring tools [e.g., biological indicators, stream survey design methods, and description(s) of reference condition] necessary to produce unbiased estimates of the ecological condition of rivers and streams that are applicable for the west; and (2) to demonstrate those tools in assessments of ecological condition of rivers and streams across multiple geographic regions in the west (U.S. EPA 1999). In addition to state- and regional-specific assessment questions, the goal of the EMAP Western Pilot's Surface Water Project is to provide answers to three general assessment questions: (1) What proportion of the perennial river and stream miles in the western United States are in acceptable [or poor] biological condition? (2) What is the relative importance of potential stressors [e.g., habitat modification, sedimentation, nutrients, temperature, toxic contaminants, grazing, urbanization] in rivers and streams across the west? and (3) With what stressors are perennial rivers and streams in poor condition associated? In addition to answering these questions for the western 12-state region of the United States, the EMAP sampling design will allow these questions to be answered in each of the three EPA regions in the west, in each participating state and in several more spatially-intensive "focus areas" in each region (Figure 1). Within North Dakota, these areas are the Upper Missouri River Basin and the Northern Glaciated Plains Ecoregion.

Field sampling for the project began in 2000 and will continue through 2004. Based on the EMAP study design, approximately 50 to 60 sites will be sampled within each state and focus area during the five-year monitoring period. Sites are chosen by EMAP staff based on a random site-selection process. By randomly selecting sites, results can be extrapolated to the entire resource population of concern (in this case, all perennial rivers and streams in the west, EPA Region VIII, North Dakota, the Missouri River Basin and the Northern Glaciated Plains Ecoregion). Ninety-eight sites were sampled in North Dakota through 2003. Sixty-three of these sites were randomly selected sites, and 35 were chosen as "targeted reference" sites. Reference sites exemplify river and stream reaches that are considered "least impaired" with respect to anthropogenic (human) disturbance or stress. An additional 12 reference sites are scheduled for sampling in 2004.

Another key objective of the Western EMAP Pilot is to build state and tribal capacity for

long-term monitoring through the development of monitoring tools, sampling designs and analytical capability, and by creating strong partnerships between states, tribes, EPA Region VIII, EPA's Office of Research and Development, and other federal resource agencies. In order to meet this objective, EPA has encouraged the states to take the lead in carrying out the monitoring component of the project. In North Dakota, the North Dakota Department of Health's Division of Water Quality is a partner in the project and has entered into a cooperative agreement with the North Dakota district of the U.S. Geological Survey to conduct sampling. It is anticipated that results from this project will become available beginning in 2005.

EMAP Great River Ecosystems (GRE) Project – The purpose of the EMAP-GRE Project is to demonstrate techniques to assess environmental conditions in the Upper Mississippi, Missouri and Ohio rivers. State-level sampling will be completed in 2004 and 2005 with the participation of federal, state and tribal partners. In North Dakota, the U.S. Geological Survey and the department have partnered and will be responsible for sampling two reaches of the Missouri River in North Dakota and Montana. They are the Garrison reach, which stretches from Garrison Dam to Lake Oahe, and the Ft. Peck reach, which extends from Ft. Peck Dam in Montana downstream to Lake Sakakawea in North Dakota.

The Great Rivers present significant challenges to assessment with their complex habitats and interstate borders. EMAP-GRE will assist regional offices and the states to report the condition of the rivers as mandated in the CWA. Sampling of mainstem, littoral and riparian habitats will be based on a system-wide and state-specific probability design. Estimates made from GRE condition will lead to more informed environmental decisions about Great River management, Gulf of Mexico hypoxia and restoration of ecological function.

Rotating Basin Biological Monitoring Program – In response to a recognized need for more and better water quality assessment information, the department initiated a biological monitoring program in 1993. This initial program, a cooperative effort with the Minnesota Pollution Control Agency and the USGS's Red River National Water Quality Assessment Program, was conducted in 1993 and 1994 and involved approximately 100 sites in the Red River Basin. The result of this initial program was development of the IBI for fish in the Red River Basin. This program continued in the Red River Basin in 1995 and 1996 with the sampling of an additional 100-plus biological monitoring sites – in the Souris River Basin in 1997, in the James River Basin in 1998, and in the Missouri River Basin in 1999 and 2000. The Upper Red River Basin, including the Sheyenne River and its tributaries, was sampled in 1995, while the Lower Red River Basin was sampled in 1996. Beginning in 1995, biological monitoring was expanded to include macroinvertebrate sampling in addition to fish. A habitat assessment also was conducted at each site following the Rapid Bioassessment Protocols published by EPA. The purpose of this biological monitoring program is to (1) develop an IBI for fish and macroinvertebrates; and (2) provide an assessment of aquatic life use attainment for those stream reaches that were assessed.

In 2001, the rotating approach to biological monitoring and assessment was discontinued while the department focused it resources in support of sampling for the EMAP Western Pilot Project. With sampling for the EMAP Western Pilot Project scheduled for completion in 2004, the department intends to begin biological monitoring of the state's rivers and streams through a rotating approach in 2005.

Working cooperatively with the Minnesota Pollution Control Agency and possibly with Manitoba Water Stewardship and Environment Canada, the department intends to begin biological monitoring for fish and macroinvertebrates in the Red River Basin in 2005. Sampling procedures for fish, macroinvertebrates and physical habitat will follow those employed by the EMAP Western Pilot, and sample sites will be selected based on a probablistic design. Targeted reference sites (i.e., best available) and impaired sites in the basin also will be selected based on an "a priori" screening process and sampled. The results from these sites will be used to refine existing multi-metric indices of biological integrity (IBIs).

REFERENCES

Bluemle, John P., 1991, *The Face of North Dakota,* Revised Edition, Educational Series 21, North Dakota Geological Survey.

Carlson, R.E., 1997, *A Trophic Status Index for Lakes, Limnology and Oceanography*, Vol. 22 (Issue 2), pp. 361-364.

EPA, 2003, *Guidance for 2004 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d) and 305(b) of the Clean Water Act*, July 21, 2003, Watershed Branch, Assessment and Watershed Protection Division, Office of Wetlands, Oceans, and Watersheds, Office of Water, United States Environmental Protection Agency, Washington, DC.

Haugerud, Neil, 2004, *Macroinvertebrate Index of Biotic Integrity for the Lake Agassiz Plain Ecoregion (48) of North Dakota,* North Dakota Department of Health, Bismarck, ND.

------ *Macroinvertebrate Index of Biotic Integrity for the Northern Glaciated Plains Ecoregion (46) of North Dakota*, North Dakota Department of Health, Bismarck, ND.

------ *Macroinvertebrate Index of Biotic Integrity for the Northwestern Great Plains Ecoregion (43) of North Dakota*, North Dakota Department of Health, Bismarck, ND.

Karr, J.R. and D. R. Dudley, 1981, *Ecological Perspectives on Water Quality Goals,* Env. Mgmt. 5:44-68.

North Dakota Department of Health, 2001, *Standards of Quality for Waters of the State,* North Dakota Century Code 33-16-02.1.

Pearson, Eric and M. J. Ell, 1997, *Effects of Rising Reservoir Water Levels Resulting from the 1993 Flood on the Methyl-Mercury Concentrations in Fish Tissues in Lake Sakakwea, ND*, North Dakota Department of Health, Bismarck, ND.

Stephen, C. E., 1995, *Derivation of Conversion Factors for the Calculation of Dissolved Freshwater Aquatic Life Criteria for Metals,* U.S. EPA, Environmental Research Laboratory, Duluth, MN.

Appendix A

Agency and Organization Data Request
Letter, Form and Contacts

November 10, 2003

Contact

Dear Agency/Organization:

The Clean Water Act requires states and tribes to monitor and assess the quality of its lakes, reservoirs, rivers, streams, and wetlands and to report on the status and condition of its surface waters every two years. The next report, which will be a consolidation of both the Section 305(b) Water Quality Assessment Report and the Section 303(d) List of Impaired Waters Needing Total Maximum Daily Loads, is due to the U.S. Environmental Protection Agency on April 1, 2004. The North Dakota Department of Health is the primary agency for water quality monitoring and assessment in the state of North Dakota and is therefore responsible for assessing the state's surface waters and preparing the consolidated report.

As part of its responsibility, the department maintains a network of water quality monitoring sites from which it collects data on chemical, physical, and biological quality. While these data will be used to provide an assessment of the state's surface water quality, the department is also requesting additional data that may be used for the 2004 report. If your agency or organization has chemical, physical, or biological water quality data that you believe would be beneficial to the state's water quality assessment, please fill out the attached form and return it to me at your earliest convenience.

If you have any questions concerning this request, please contact me at 701.328.5214. Your cooperation in this matter is appreciated.

Sincerely,

Michael J. Ell
Environmental Administrator
Division of Water Quality

Agency/Organization Contacts

Jeff Towner
Field Supervisor
North Dakota Field Office
US Fish and Wildlife Service
3425 Miriam Avenue
Bismarck, ND 58501

Dennis Breitzman
Dakotas Area Office
Bureau of Reclamation
PO Box 1017
304 East Broadway
Bismarck, ND 58502-1017

Dr. Mark Gonzalez
Soil Scientist/Hydrologist
Dakota Prairies Grasslands
US Forest Service
240 West Century Ave
Bismarck, ND 58503

Keith Weston
Water Quality Specialist
Natural Resources Conservation Service
220 East Rosser Avenue
PO Box 1458
Bismarck, ND 58502-1458

Dean Hildebrand
Director
North Dakota Game and Fish Department
100 North Bismarck Expressway
Bismarck, ND 58501-5095
cc. Terry Steinwand
Steve Dyke

Bob Backman
River Keepers
325 7th Street South
Fargo, ND 58103

Gerald Groenewold
EERC
University of North Dakota
PO Box 9018
Grand Forks, ND 58202-9018
cc. Wes Peck

Molly McGregor
Minnesota Pollution Control Agency
714 Lake Avenue, No. 220
Detroit Lakes MN 56501

Dr. John Watson
School of Engineering and Mines
University of North Dakota
PO Box 8155
Grand Forks, ND 58202-8155

Dr. Steven Kelsch
Department of Biology
University of North Dakota
PO Box 9019
Grand Forks, ND 58202-8155

Dr. Richard Crawford
Institute for Ecological Studies
University of North Dakota
PO Box 9019
Grand Forks, ND 58202-8155

Dr. Carolyn E. Grygiel
Natural Resources Management Program Director
Department of Animal and Range Sciences
North Dakota State University
Hultz Hall 163
Fargo, ND 58105

Dr. Frank Yazdani, Chairman
Department Civil Engineering and Construction
North Dakota State University
Civil and Industrial Engineering 201
Fargo, ND 58105

Dr. William Bleier, Chairman
Department of Biological Sciences
North Dakota State University
Stevens Hall, Room 218
Fargo, ND 58105

John Bluemle
North Dakota Geological Survey
600 East Boulevard Avenue
Bismarck, ND 58505-0840

Greg Wiche
US Geological Survey
821 East Interstate Avenue
Bismarck, ND 58503

Lance Yohe
Red River Basin Commission
119 5th Street South, #209
PO Box 66
Moorhead, MN 56561-0066

Col. Kurt F. Ubbelohde, Commander
US Army Corps of Engineers
Omaha District
106 S. 15th Street
Omaha, NE 68102-1618

Col. Robert L. Ball
US Army Corps of Engineers
St Paul District
190 5th Street East
St. Paul, MN 55101-1638

Bob Bukantis
Montana Department of Environmental Quality
Monitoring and Data Management Bureau
Metcalf Building Office
1520 E 6th Avenue
P.O. Box 200901
Helena, MT 59620

Jim Feeney
Watershed Protection Program
South Dakota Department of Environment and Natural Resources
Joe Foss Building
523 East Capitol Avenue
Pierre, SD 57501-3181

Don Rufledt
Bureau of Land Management
2933 3rd Ave West
Dickinson, ND 58601

Dale Frink
North Dakota State Water Commission
900 East Boulevard Avenue
Bismarck, ND 58505-0850

Water Quality Data Summary for North Dakota

Contact Person: _____

Address: _____

_____

_____

Phone: _____

Email: _____

Data Description: _____

_____

_____

_____

_____

_____

Data Period of Record: _____

_____

Were the data collected according to standard operating procedures and by following a documented quality assurance/quality control plan?

Yes No Other: _____

Data Availability (e.g., electronic, report): _____

If you have any questions concerning this information, please contact Mike Ell at 701.328.5214. Please return form to: Mike Ell, North Dakota Department of Health, Division of Water Quality, P.O. Box 5520, 1200 Missouri Ave, Bismarck, ND 58502-5520

Appendix B

Estimated Weighted Average Methyl-mercury Concentrations in Fish for Lake Sakakawea

Chinook Salmon			
Size Range (cm)	Average methyl-Hg Concentration (μg/g)[1]	Weighting Factor[2]	Weighted Concentration (μg/g)[3]
< 63	0.173	0.236	0.041
63-72	0.298	0.646	0.192
>73	0.270	0.128	0.035
Weighted Average[4]			0.268

Northern Pike			
Size Range (cm)	Average methyl-Hg Concentration (μg/g)[1]	Weighting Factor[2]	Weighted Concentration (μg/g)[3]
< 58	0.12	0.138	0.017
59-77	0.355	0.454	0.161
78-99	0.479	0.408	0.195
>99	0.895	0	0
Weighted Average[4]			0.373

Sauger			
Size Range (cm)	Average methyl-Hg Concentration (μg/g)[1]	Weighting Factor[2]	Weighted Concentration (μg/g)[3]
< 37	0.17	0.028	0.005
38-47	0.337	0.873	0.294
>47	0.72	0.099	0.071
Weighted Average[4]			0.37

[1] Based on the average methyl-mercury concentration for fish sampled in the size range.

[2] Estimated as the proportion of fish caught and kept by fisherman for that species and waterbody. Based on data obtained from the report entitled *Angler Use and Sport Fishing Catch Survey on Lake Sakakawea, North Dakota - May 1 Through October 24, 2000*, prepared by Larry Brooks and Jeff Hendrickson, submitted to North Dakota Game and Fish Department, Project F-2-R-47, Study 3, Number A-1275, Job C.

[3] Calculated by multiplying the average concentration per size range with the weighting factor for the size range.

[4] Calculated as the sum of the weighted concentrations for each size range.

Walleye			
Size Range (cm)	Average methyl-Hg Concentration (μg/g)[1]	Weighting Factor[2]	Weighted Concentration (μg/g)[3]
< 40	0.171	0.216	0.037
40-46	0.196	0.411	0.081
47-50	0.389	0.248	0.096
>50	0.508	0.125	0.064
Weighted Average[4]			0.278

[1] Based on the average methyl-mercury concentration for fish sampled in the size range.

[2] Estimated as the proportion of fish caught and kept by fisherman for that species and waterbody. Based on data obtained from the report entitled *Angler Use and Sport Fishing Catch Survey on Lake Sakakawea, North Dakota - May 1 Through October 24, 2000*, prepared by Larry Brooks and Jeff Hendrickson, submitted to North Dakota Game and Fish Department, Project F-2-R-47, Study 3, Number A-1275, Job C.

[3] Calculated by multiplying the average concentration per size range with the weighting factor for the size range.

[4] Calculated as the sum of the weighted concentrations for each size range.

Appendix C

Estimated Weighted Average Methyl-mercury Concentrations in Fish for Lake Oahe and the Missouri River

Walleye			
Size Range (cm)	Average methyl-Hg Concentration (μg/g)[1]	Weighting Factor[2]	Weighted Concentration (μg/g)[3]
< 36	0.15	0.218	0.033
36-39	0.152	0.505	0.077
40-51	0.243	0.264	0.064
>51	0.63	0.013	0.008
Weighted Average[4]			0.183

[1] Based on the average methyl-mercury concentration for fish sampled in the size range.

[2] Estimated as the proportion of fish caught and kept by fisherman for that species and waterbody. Based on data obtained from the report entitled *Angler Use and Sport Fishing Catch Survey on Lake Sakakawea, North Dakota - April 1 Through October 15, 2000,* prepared by Larry Brooks and Jeff Hendrickson, submitted to North Dakota Game and Fish Department, Project F-2-R-47, Study 3, Number A-1275, Job B.

[3] Calculated by multiplying the average concentration per size range with the weighting factor for the size range.

[4] Calculated as the sum of the weighted concentrations for each size range.

Appendix D

Estimated Weighted Average Methyl-mercury Concentrations in Fish for Devils Lake

Walleye			
Size Range (cm)	Average methyl-Hg Concentration (μg/g)[1]	Weighting Factor[2]	Weighted Concentration (μg/g)[3]
< 34	0.43	0.187	0.081
34-40	0.623	0.462	0.288
41-49	0.608	0.249	0.151
50-60	1.248	0.083	0.104
>60	1.79	0.019	0.034
Weighted Average[4]			0.658

Northern Pike			
Size Range (cm)	Average methyl-Hg Concentration (μg/g)[1]	Weighting Factor[2]	Weighted Concentration (μg/g)[3]
< 58	0.43	0.11	0.047
59-67	0.569	0.439	0.25
68-77	0.659	0.356	0.235
>77	1.153	0.095	0.11
Weighted Average[4]			0.642

[1] Based on the average methyl-mercury concentration for fish sampled in the size range.

[2] Estimated as the proportion of fish caught and kept by fisherman for that species and waterbody. Based on data obtained from the report entitled *Angler Use and Sport Fishing Catch Survey on Lake Sakakawea, North Dakota - May 1 Through October 31, 2001*, prepared by Larry Brooks and Randy Hiltner, submitted to North Dakota Game and Fish Department, Project F-2-R-49, Study 3, Number 2, October 2002.

[3] Calculated by multiplying the average concentration per size range with the weighting factor for the size range.

[4] Calculated as the sum of the weighted concentrations for each size range.

Yellow Perch			
Size Range (cm)	Average methyl-Hg Concentration (μg/g)[1]	Weighting Factor[2]	Weighted Concentration (μg/g)[3]
< 21	0.27	0.082	0.022
21-25	0.529	0.539	0.285
26-30	0.437	0.333	0.146
>30	0.62	0.046	0.029
Weighted Average[4]			0.482

White Bass			
Size Range (cm)	Average methyl-Hg Concentration (μg/g)[1]	Weighting Factor[2]	Weighted Concentration (μg/g)[3]
< 28	0.31	0.061	0.02
28-35	0.54	0.338	0.182
36-41	0.933	0.41	0.382
>41	1.31	0.191	0.25
Weighted Average[4]			0.834

[1] Based on the average methyl-mercury concentration for fish sampled in the size range.

[2] Estimated as the proportion of fish caught and kept by fisherman for that species and waterbody. Based on data obtained from the report entitled *Angler Use and Sport Fishing Catch Survey on Lake Sakakawea, North Dakota - May 1 Through October 31, 2001*, prepared by Larry Brooks and Randy Hiltner, submitted to North Dakota Game and Fish Department, Project F-2-R-49, Study 3, Number 2, October 2002.

[3] Calculated by multiplying the average concentration per size range with the weighting factor for the size range.

[4] Calculated as the sum of the weighted concentrations for each size range.

Appendix E

Estimated Weighted Average Methyl-mercury Concentrations in Fish for the Red River of the North

Walleye			
Size Range (cm)	Average methyl-Hg Concentration (μg/g)[1]	Weighting Factor[2]	Weighted Concentration (μg/g)[3]
< 41	0.74	0.484	0.36
41-63	0.885	0.484	0.428
>63	1.598	0.032	0.051
Weighted Average[4]			0.839

Channel Catfish			
Size Range (cm)	Average methyl-Hg Concentration (μg/g)[1]	Weighting Factor[2]	Weighted Concentration (μg/g)[3]
< 38	0.17	0.276	0.046
38-46	0.287	0.141	0.04
47-56	0.381	0.245	0.093
57-68	0.527	0.252	0.133
>68	0.814	0.086	0.07
Weighted Average[4]			0.382

[1] Based on the average methyl-mercury concentration for fish sampled in the size range.

[2] Estimated as the proportion of fish caught and kept by fisherman for that species and waterbody. Based on data obtained from the report entitled *Angler Use and Sport Fishing Catch Survey on Red River, North Dakota - March 15 Through October 31, 2000*, prepared by Larry Brooks and Lynn Schlueter, submitted to North Dakota Game and Fish Department, Project F-2-R-48, Study 3, June 2002.

[3] Calculated by multiplying the average concentration per size range with the weighting factor for the size range.

[4] Calculated as the sum of the weighted concentrations for each size range.

Appendix F

Public Notice Statement Requesting Public Comment on the State of North Dakota's Draft 2004 Section 303(d) List

PUBLIC NOTICE STATEMENT

Notice of submittal to the U.S. Environmental Protection Agency (EPA) and a request for public comment on the State of North Dakota's draft 2004 Section 303(d) List of Waters Needing Total Maximum Daily Loads (TMDLs).

1. Summary

Section 303(d) of the Clean Water Act (CWA) and its accompanying regulations (CFR Part 130 Section 7) requires each state to identify waterbodies (i.e., lakes, reservoirs, rivers, streams, and wetlands) which are considered water quality limited and requiring load allocations, waste load allocations, or total maximum daily loads. A waterbody is considered water quality limited when it is known that its water quality does not meet applicable water quality standards or is not expected to meet applicable water quality standards. Waterbodies can be water quality limited due to point sources of pollution, nonpoint sources of pollution, or both.

Section 303(d) of the Clean Water Act requires states to submit their lists of water quality-limited waterbodies "from time to time." Federal regulations have clarified this language; therefore, beginning in 1992 and by April 1st of every even-numbered year thereafter, states were required to submit a revised list of waters needing TMDLs. This list has become known as the "TMDL list" or "Section 303(d) list." The state of North Dakota last submitted its TMDL list to EPA in March 2003. This list, referred to as the "2002 list" was approved by EPA on April 17, 2003. The draft 2004 Section 303(d) list, which has been submitted to EPA as part of the integrated Section 305(b) water quality assessment report and Section 303(d) TMDL list, includes a list of waterbodies not meeting water quality standards and which need TMDLs, and a list of waterbodies which have been removed from the list submitted as part of the 2002 list.

Following an opportunity for public comment, the state must submit its list to the EPA Regional Administrator. The EPA Regional Administrator then has 30 days to either approve or disapprove the state listings. The purpose of this notice is to solicit public comment on the draft list prior to formally submitting the list to the EPA Regional Administrator.

2. Public Comments

Persons wishing to comment on the State's draft 2004 Section 303(d) List of Waters Needing TMDLs may do so, in writing, within thirty (30) days of the date of this public notice. Comments must be received within this 30-day period to ensure consideration in the EPA approval or disapproval decision. All comments should include the name, address, and telephone number of the person submitting comments, and a statement of the relevant facts upon which they are based. All comments should be submitted to the attention of the Section 303(d) TMDL Coordinator, North Dakota Department of Health, Division of Water Quality, 1200 Missouri Avenue, Bismarck, ND 58506-5520. The 2004 Section 303(d) TMDL list may be reviewed at the above address during normal business hours or by accessing it through the Department's web address (http://www.health.state.nd.us). Copies may also be requested by writing to the Department at the above address or by calling 701.328.5210.

Public Notice Number ND-2004-011

Appendix G

EPA Comments on the State of North Dakota's
Draft 2004 Section 303(d) List and the State's Responses

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
999 18TH STREET - SUITE 300
DENVER, CO 80202-2466
Phone 800-227-8917
http://www.epa.gov/region08

April 28, 2004

Ref: 8EPR-EP

Dennis Fewless, Director
Division of Water Quality
North Dakota Department of Health
P.O. Box 5520
Bismarck, ND 58505-5520

Re: Year 2004 Draft North Dakota Integrated Report for Sections 303(d) and 305(b) of the Clean Water Act

Dear Mr. Fewless:

We have reviewed the Department's draft 2004 Integrated Report for Sections 303(d) and 305(b) of the Clean Water Act and appreciate the opportunity to provide comment. We would like to commend the Department of Health for creating North Dakota's first integrated report (IR). The IR combines the Section 305(b) Water Quality Report to Congress and the Section 303(d) list of waterbodies not meeting water quality standards (i.e., waters in need of total maximum daily loads (TMDLs)) into one cohesive document. We also commend the Department for the detailed and thorough explanations provided with the waters proposed for delisting.

Our comments are provided as an enclosure to this letter. Please contact Vern Berry of my staff at 303-312-6234, should you have any questions with regard to our comments. Again we appreciate your diligent work on this report.

Sincerely,

/s/ by Karen Hamilton

Karen Hamilton, Chief
Water Quality Unit

Enclosure

EPA's Comments on the Draft North Dakota Integrated Section 305(b) Water Quality Assessment Report and Section 303(d) List of Waters Needing Total Maximum Daily Loads

Comments Related to Categories 1-4

Monitoring Schedule: The final integrated report (IR) needs to include a monitoring schedule as described in EPA's 2004 IR guidance (see pages 3, 18-19). The schedule should describe the State's monitoring plan for 2004-2006, and it should be consistent with the monitoring priorities identified in the State's monitoring strategy.

State Response: A monitoring strategy for TMDL development in the next two years as well as a description of programmatic monitoring scheduled for the next two years has been provided in Part VI. F. TMDL Development and Monitoring Schedule.

Summary of Waterbody Categorization: It would be helpful if the final 2004 IR included a summary table indicating the number of waters that are listed in each of the categories 1-5. This would provide the public with a rough idea of how North Dakota waters are categorized without having to review the ADB files.

State Response: An "Assessment Category Summary" section has been added to Part V. A. (Rivers and Streams) and Part V. B. (Lakes and Reservoirs). These narrative descriptions and associated tables provide summary information on the number of assessment units (AUs), streams miles and lake acres in each assessment category (1-5).

Comments Related to Category 5

• Page IV-4, Part V.D, Sufficient and Credible Data Requirements: EPA does not recommend that data be excluded from consideration solely on the basis of age, nor do we recommend the use of a rigid minimum sample size in the assessment process. For the 2006 listing cycle we recommend that ND develop criterion for making overwhelming evidence determinations using small data sets, rather than the current example of how an overwhelming test "could be" applied. Colorado, Montana and Utah have, or are in the process of, developing overwhelming evidence criterion for small data sets which could be used as a guide for North Dakota.

State Response: As suggested, the Department will consider this comment for the 2006 report.

• Page IV-7, Biological Data: EPA Region 8 would like to recognize the work of the North Dakota

Department of Health (NDDoH) staff in developing biological indices for North Dakota. We appreciate the opportunity to review and comment on the draft documents and look forward to working with the NDDoH to refine and improve the rigor of these assessment methods. Our detailed comments on the IBIs were provided separately (See the 4/27/04 email from Tom Johnson to Mike Ell).

Based on our IBI review, we recommend that the State address several of the critical technical issues before incorporating the indices into the NDDoH's process for making assessment determinations (fully supporting or listing). We recognize that the State has the discretion to proceed with implementation of the biological indices. However, EPA feels that many of these technical issues would improve the accuracy and rigor of the biological assessment.

We particularly recommend revisions to the listing thresholds presented in the 2004 draft IR. Rather than using the 25th and 75th percentiles of all sites in the state to determine good versus poor, it would be better to compare site scores to a population of reference sites. Another option would be to lower the percentile threshold for "poor"rankings (e.g., 10th percentile) which would result in fewer waters being assigned to category 5 and on the Section 303(d) list. We look forward to working with NDDoH to resolve some of the technical issues prior to the 2006 IR cycle.

State Response: The Department appreciates the comments provided by EPA, but feels confident the IBIs which have been developed for macroinvertebrates and fish are sufficiently rigorous to be used as an assessment tool for Section 305(b) assessment and Section 303(d) listing. The Department has revised its scoring criteria and has lowered the percentile threshold for "poor" rankings and impaired aquatic life use from the 25th percentile to the 10th percentile consistent with EPA's comments. The Department has also agreed to not de-list any previously listed waters which are impaired for aquatic life use, even if the IBI scores are in the upper 25th percentile ranking suggesting a "good" ranking or fully supporting aquatic life use.

• Pages VI-2 & 4, TMDL Prioritization and Development Schedule: Section 303(d) of the Clean Water Act (CWA) (see also 40 CFR §130.7(b)(4)) requires that state include a priority ranking of TMDL listed waters, and identification of waters targeted for TMDL development in the next two years. However, it does not require that TMDLs be developed for the highest ranked waters within the next two years (i.e., "targeted" waters can be a subset of "priority 1" waters). North Dakota's 2004 303(d) list identifies 122 waters as priority 1. It also defines priority 1 waters as those for which TMDLs are scheduled to begin in the next two years. We wonder if this is a realistic pace of TMDL development (approximately 5/month for the next 2 years)? Using a linear progression of TMDL development the State will need to completed approximately 40 TMDLs per year to meet the 13 year schedule suggested by EPA. We recommend that the State consider identifying a smaller subset of the priority 1 waters as those that will be targeted for TMDL development in the next two years.

State Response: The Department has revised its Section 303(d) list of impaired waters and has divided its priority 1 AUs into priority 1A and 1B AUs. Based on this prioritization, the Department has committed to completing TMDLs for 106 waterbody/pollutant combinations in the next two years and, assuming funding is available, will initiate monitoring for TMDL development for 40 additional waterbodies representing 57 waterbody/pollutant combinations. The Department remains committed to its proposed schedule to complete TMDLs for all AUs on the list in the next 10 years.

• Page VI-19, English Coulee listing: The list of impairments for the English Coulee stream reach includes nutrients. Page VI-4 of the IR includes a statement of NDDoH's intention to delay nutrient listings for rivers and streams until such time as scientifically defensible nutrient criteria are developed. The nutrient listing for English Coulee may have been an error, please revise as appropriate to be consistent with other streams in the state.

State Response: The TMDL list and ADB have been revised and nutrients has been removed as a pollutant causing impairment to English Coulee.

• Page VI-31, Antelope Creek listing: The fecal coliform listing for recreation use for Antelope Creek seems to be a duplicate of a similar listing on page VI-30. Please check both listings and revise as appropriate.

State Response: Revised, duplicate removed from list.

• Pages VI-43 to 52, Delisting Waters Using Macroinvertebrate IBI Data: We recommend that decisions to delist waters be made using a similar type and amount of data. Specifically, for waters that were previously listed for sediment, if sediment data (e.g., TSS) was used to originally list those waters, then newer sediment data should be used to demonstrate that an impairment no longer exists. If the waters were originally listed based an evaluated process such as visual observations or best professional judgement, then a similar approach should be documented to show that listing is no longer warrented. We do not recommend that the macroinvertebrate IBI data be used as the basis for making delisting decisions until the biological indicies are further refined.

State Response: See earlier response to comments on the Department's use of the IBI. As stated, assessment decisions to de-list were not made based solely on IBI scores showing a "good" ranking.

• Appendix F, Public Notice: Please provide a description of the circulation for the public notice (i.e., name of newspaper(s)), and a summary of other contacts that received the notice. The final IR should include a response to comments section that includes the comments and NDDoH's response in order to demonstrate how the public comments were considered in the final decisions.

State Response: The Public Notice Section (Part VI. C.) has been revised as suggested. Comments were only received from EPA, therefore all responses to comments are included in Appendix G.