Session 3: The Process for Listing and Delisting Waters of the State

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Acronyms

AUID – Assessment Unit Identification
BMP – Best Management Practices
CWA – Clean Water Act
CWP – Clean Water Partnership
EPA – Environmental Protection Agency
LAP – Lake Assessment Program
MDH – Minnesota Department of Health
MPCA – Minnesota Pollution Control Agency
ORVW – Outstanding Resource Value Water
PM – Project Manager
QAPP – Quality Assurance Performance Plan
QA/QC – Quality Assurance/Quality Control
TMDL – Total Maximum Daily Load
TP – Total Phosphorus
USGS – United States Geological Survey

The decision to place a Minnesota waterbody on the federal Clean Water Act Section 303 (d) Impaired Waters List would appear to be a straightforward process; waters are either impaired or not. However, in reality, the water quality assessment process is often very complex and can include a fair amount of uncertainty. When determining whether a waterbody should be listed as impaired, the MPCA must consider many different types and sources of data, different categories of pollutants, different beneficial uses of surface waters, the variability in natural systems, as well as many other variables.

To understand how and why waterbodies are placed on the Impaired Waters List, one must understand some fundamental concepts that guide implementation of the State's water quality standards program.

Water Quality Standards

Water quality standards are the fundamental benchmarks by which the quality of surface waters is measured and by which MPCA determines impairment. Minnesota Rules Chapters 7050 and 7052 guide administration of MPCA's water quality standards program.

Water quality standards include an assignment of beneficial uses to every waterbody in the state, as well as the development of the numeric and narrative criteria that protect those uses.

Beneficial use Classifications

Minnesota Rules Chapter 7050 identifies seven beneficial uses for which surface waters are protected. The use classes are numbered 1-7. Numbers do not imply priority rank. Both Class 2 and Class 7 waters, i.e., all waters of the state, are also protected for industrial (Class 3A, B and C), agricultural (Class 4 A and B), aesthetics and navigation (Class 5) and other uses (Class 6). For example, the St. Croix River, from the dam in Taylor's Falls to its mouth is classified as 1C, 2Bd, 3B, 4A, 4B, 5 and 6, and is therefore protected for all uses defined by these use classes.

Note: If a pollutant has numeric standards for more than one beneficial use class, the most stringent applies.

Table 3-1: Beneficial Use Classifications

Use Class	Beneficial Use
Class 1	Drinking Water
Class 2	Aquatic life and recreation
Class 2A	Cold water fisheries, trout waters
Class 2Bd	Cool and warm water fisheries, drinking water
Class 2B	Cool and warm water fisheries
Class 2C	Indigenous fish and associated aquatic community
Class 2D	Wetlands
Class 3	Industrial Uses and Cooling
Class 4A	Agricultural and wildlife uses
Class 4B	Agricultural Use, livestock and wildlife watering
Class 5	Aesthetics and navigation
Class 6	Other uses
Class 7	Limited resource value waters (not fully protected for aquatic life due to lack of water, lack of habitat, or extensive physical alterations)

All surface waters in Minnesota, including lakes, rivers, streams and wetlands, are protected for aquatic life and recreation where these uses are attainable, except when the waterbody has been individually assessed and reclassified as a limited resource value water (Class 7).

Protection of aquatic life means that healthy, diverse and successfully reproducing populations of aquatic organisms (including fish and invertebrates) are maintained.

Protection of recreation for all surface waters, except wetlands and limited resource value waters means that conditions suitable for swimming and other forms of water recreation are maintained. Recreation in wetlands typically refers to boating and other forms of aquatic recreation (can include fishing if conditions are suitable). Class 7 waters (limited resource value waters) do not support swimming, but may support wading, nature study or other forms of recreation that does not involve immersion in the water.

Numeric Water Quality Standards

A **numeric water quality standard** sets a safe concentration for a specific pollutant in water, associated with a particular beneficial use. Numeric standards are associated with all use classes except Class 6 (other uses). Ideally, if the numeric standard is not exceeded, the beneficial use will be protected. However, nature is very complex and variable and the MPCA may need to use a variety of tools, such as chemical and biological monitoring, to fully understand whether a beneficial use is being protected.

When MPCA assesses surface waters to determine impairment, staff could review any of the applicable beneficial uses and associated standards. But, in practice, waters are typically assessed only with respect to aquatic life, aquatic recreation, aquatic consumption, and aesthetic uses and standards. The idea being that, if the water is in compliance with Class 2 standards, then, with few exceptions, the less sensitive Class 3, 4, 5 and 6 beneficial uses will also be protected. Similarly, aquatic life standards (Class 2) are more stringent than drinking water standards (Class 1, 2Bd) for many pollutants. Therefore, application of Class 2 standards will likely "protect" drinking water as well.

Narrative Water Quality Standards

A **narrative water quality standard** prohibits unacceptable conditions in or upon the water, such as floating solids, scum, visible oil film, or nuisance algal blooms. Narrative standards are sometimes called 'free froms'. Most narrative standards protect aesthetic life beneficial uses.

Eutrophication: Eutrophication is a condition in an aquatic ecosystem where high nutrient concentrations stimulate blooms of algae and aquatic plants.

Narrative standards are not quantitative, so the determination that one has been exceeded requires a 'weight of evidence' approach to data analysis, showing a consistent pattern of violations. Using narrative standards to determine impairment involves an unavoidable element of professional judgment.

These standards protect surface waters and aquatic life from:

- eutrophication (particularly lakes)
- impairment of the biological community
- impairment of fish for human consumption

Non-Degradation

In addition to numeric and narrative standards and the beneficial uses they protect, another important element of water quality standards is the concept of **nondegradation.** The fundamental concept of nondegradation (also called anti-degradation) is the protection of waterbodies whose water quality *is better than* the applicable water quality standards.

The purpose of nondegradation is to ensure that existing high quality waters are maintained and not allowed to degrade down to the level of the water quality standards. Nondegradation is a very important part of pollution control since it prevents clean waters from becoming polluted.

Federal guidance establishes three tiers of nondegradation:

Tier 1 – requires that waters are in compliance with water quality standards.

Tier 2 – requires protection of waters that have water quality better than standards, unless there is a social or economic need to degrade them to the level of the standards.

Tier 3 – provides the highest level of protection from pollution for waters designated as outstanding, very sensitive or unique resources. These are called Outstanding Resource Value Waters (ORVWs). ORVWs are placed in one of two categories – 1) "prohibited" or 2) "restricted":

1) **Prohibited:**
New or expanding point and nonpoint sources of pollution are forbidden from discharging to the prohibited category.

2) **Restricted:**
New or expanding point and nonpoint sources of pollution are not allowed to discharge to the restricted category unless the discharger can demonstrate there is no "prudent and feasible alternative" to allowing the increased pollutant loading.

The Listing of Impaired Waters

The 1972 amendments to the federal Clean Water Act require the MPCA to assess the water quality of all rivers, stream and lakes in Minnesota. Waters which do not meet water quality standards and which are not supporting assigned beneficial uses are defined as "impaired". Impaired waters must be listed and reported to the citizens of Minnesota and to the EPA in the MPCA's Clean Water Act Section 305(b) report and the Section 303(d) (Impaired Waters) List.

The listing of a waterbody as non-supporting or partially supporting beneficial uses in the Section 305(b) report does not carry regulatory consequences; it is simply a report on status and progress. Unlike the Section 305(b), the Section 303(d) List is a compilation of waters considered to be impaired and **may** carry some regulatory consequences.

The 303 (d) or Impaired Waters List

Minnesota has chosen to accept delegation for the Impaired Waters Program, meaning that MPCA is responsible for preparing a Section 303(d) list. The assessment and listing of surface water segments generally occurs over a two-year cycle that ends on April 1 of even-numbered years.

Because of the regulatory ramifications of being placed on the list, it is important that the MPCA makes accurate, fair and consistent decisions. To ensure that this occurs, the EPA reviews MPCA's Section 303(d) list and retains the authority to either approve or disapprove the list. When reviewing MPCA's list, EPA considers whether the list has been developed in accordance with federal TMDL guidance, the State's own TMDL guidance, and the Clean Water Act. Once EPA approves the Section 303(d) list, MPCA must ensure that a TMDL study for each impaired waters begins. Of course, local efforts to improve or restore water quality can be initiated before Section 303(d) listing is completed.

Data Needs

Water quality and other types of data are the backbone of impairment determinations. Access to good quality data increases the probability that MPCA's water quality assessments are accurate. Data collection and analysis involves sampling, laboratory analysis, quality assurance/quality control (QA/QC), data storage and, finally, data analysis.

Most water quality data used in this process have been collected by the MPCA; however, data collected by others can be used provided it meets QA/QC requirements. If your project has good quality data, ensure that it is entered into the STORET database. MPCA relies heavily upon STORET data to make its determinations about impairment or about whether a waterbody should be taken off the Impaired Waters List.

Types of Monitoring used to Assess Waters

The data that is used to determine whether a waterbody is meeting water quality standards has often been collected for a variety of reasons. Typically, MPCA is involved in collecting the following kinds of monitoring:

- **Condition monitoring** – captures status and trends in water quality.

  Condition monitoring of rivers and lakes is the primary source of data used in the Section 305(b) and Section 303(d) assessments. Other data sets are only used if they can be compared to water quality standards and are suited to the assessment process. Condition monitoring includes routine chemical monitoring, biological monitoring and citizen lake monitoring.

- **Problem investigation monitoring** – evaluates the causes and sources of impairment.

  Problem investigation monitoring includes monitoring as part of the Clean Water Partnership (CWP), Lake Assessment Program (LAP), load allocation or TMDL studies. This type of monitoring investigates potential sources of pollution, nutrient loading, etc., and recommends appropriate clean-up measures.

- **Effectiveness monitoring** – provides information about the extent to which clean-up activities have had an effect on water quality.

  Effectiveness monitoring includes special studies designed to assess the results of pollution reduction or remedial actions. An example would be the monitoring up and down stream of a new or expanded wastewater treatment facility, or follow-up monitoring after implementation of a Clean Water Partnership Program (CWP) or TMDL project.

- **Targeted monitoring** – investigates the impacts of specific events, such as a fish kill.

  Targeted monitoring provides information about a particular point of interest and is limited in space and time. Examples include the monitoring associated with spills, emergency bypasses, suspected illegal discharge, or fish kills.

MPCA's General Approach to Data Assessment

Assessments of use support are made for individual waterbodies or Assessment Unit IDs (AUIDs). Each waterbody is identified by a unique number, comprised of the USGS eight-digit hydrologic code plus the three digit assessment reach. The waterbody unit for river system assessments is the river reach AUID, which extends from one significant tributary to another and is typically less than 20 miles in length. Lakes and wetlands are typically evaluated as individual whole waterbodies and are identified by a two digit county code plus a four digit sequential number.

The MPCA uses data collected over the most recent 10-year period for all water quality assessments, except in the case of fish contaminated with mercury.

The most recent data for all pollutant categories may be given more weight by members of the Professional Judgment Team if, for example, conditions impacting water quality are known to have changed in the river reach during that 10-year period. The goal is to use data from the 10-year period that best represents the current water quality conditions.

The Role of Professional Judgment

It is important to recognize the value and necessity of including professional judgment in the water quality assessment process. Professional judgment plays an important role because:

- No assessment guidance can address all unforeseen circumstances
- Variability found in nature requires using personal judgment at times
- Professional review of available data can extract the most value information from and supplement small data sets
- Without it, assessments are more likely to be flawed

How Professional Judgment Teams are used

A Professional Judgment Team is formed for each basin. The Professional Judgment Teams meet (usually in March and April of odd-numbered years) to review how assessment data were used and interpreted, whether the data are adequate and appropriate for determining use-support and to determine potential causes of water quality impairment within the basin (such as low dissolved oxygen or high phosphorus, etc.).

The membership of the team includes a MPCA Basin Coordinator who is knowledgeable about local water quality issues, MPCA monitoring and assessment staff, and, when appropriate, staff from organizations outside the MPCA whose data was used in the assessments.

Uncertainty in Water Quality Assessments

The MPCA is very aware of the potential problems that can arise from conducting assessments with limited data. MPCA's current approach to assessment is clearly a compromise between the need to assess as many waterbodies across the state as possible, and the importance of minimizing the potential for making inaccurate assessments.

Some level of uncertainty is part of every analysis of water quality data. There is always a chance that analyses will be incorrect. The number of data points the MPCA requires as a minimum for Section 303(d) assessments is small in the context of statistical analyses of uncertainty. It is important to note that in the vast majority of cases where MPCA has placed a waterbody on the Impaired Waters List, subsequent monitoring corroborated the initial determination of impairment.

It has been the experience of the MPCA that relatively few waterbodies have been incorrectly determined to be impaired. Those waterbodies have been delisted.

Weight of Evidence

MPCA approaches water quality assessment in a way that is designed to reduce the probability that erroneous impairment determinations will be made. Data is first reviewed for accuracy and verified by professional water quality experts at the state and local levels as part of the data entry process into the centralized water quality database (STORET) used for assessments.

MPCA staff then screens available data using the impairment thresholds and develops pre-assessment recommendations for subsequent use by the Professional Judgment Teams. "Pre-assessment" reports are prepared for each major drainage basin in the state and sent out to MPCA Regional office staff and other interested parties for review prior to the professional judgment meetings. Professional review of data is a very important part of minimizing erroneous impairment determinations.

Professional Judgment Team Determinations

The Professional Judgment Team's first step in making impairment decisions is to review available chemical and biological data sets. This is a computerized screening of the data which identifies whether waterbodies meet minimum data requirements, includes appropriate periods of record, and shows exceedances of impairment thresholds.

How are Decisions Made?

Once this step is completed, the team considers a wide range of factors that can affect water quality and use impairment in a particular waterbody. The team may consider:

- Quality and quantity of all available data
- The magnitude, duration and frequency of exceedances
- Timing of exceedances
- Naturally occurring conditions that affect pollutant concentrations and toxicity
- Weather and flow conditions
- Known influences on water quality in the watershed, and
- Changes in the watershed that may have changed water quality

Based on all of this information, a final impairment decision is made regarding a given water quality standard and the associated beneficial use. These decisions are based on a **"weight of evidence" concept**, which simply means that when all the readily available data and information is considered together and in the appropriate context (e.g. ecoregion, known pollution sources, etc.), a convincing pattern emerges on the condition of a waterbody.

It is important to note that use-support decisions are made based on the principle of **independent applicability**. This means that a waterbody should meet multiple assessment tests for a given use to be considered not impaired. For example, if biological monitoring data indicate non-support of aquatic life uses and water chemistry data indicate full support of aquatic life uses, then the water is considered impaired for aquatic life.

Listing Process for Lakes using Narrative Standards

In Minnesota, as is the case nationwide, excess plant nutrients (nitrogen and phosphorus) from anthropogenic (man-made) sources contribute to cultural eutrophication of lakes. Eutrophication is one of the primary causes of non-attainment of swimmable uses in lakes nationwide. In the absence of numeric nutrient and eutrophication standards in Minnesota Rules Chapter 7050, narrative standards have been used to protect the recreational, aquatic life and aesthetic uses of lakes. Presently, MPCA is promulgating new nutrient standards for lakes in Minnesota.

Data Requirements for the Determination of Impairment in Lakes

The first step in the assessment process is to determine whether the waterbody is classified as a *lake*, which means it:

- is listed in MDNR Bulletin 25
- is not listed as a wetland in the MDNR Public Waters Inventory, and
- is 10 acres or larger, and
- has a hydraulic residence time of at least 14 days

Hydraulic residence time: the average time required to completely renew a waterbody's water volume.

Some waterbodies listed as wetlands are being treated as lakes if, for example, they are being managed for fishing by being stocked or if they have a beach area; these may be assessed as a lake.
Minimum data requirements for a lake assessment are:

- 10 total phosphorus (TP), 10 chlorophyll-a and 10 Secchi measurements, with case-by-case exceptions;
- data collected in the most recent 10 years (referred to as "monitored" in the Section 305(b) and Lake Water Quality Assessment reports); and
- data needed for both causal and response variables.

There is an opportunity for more detailed site-specific data review before making an impairment decision for Section 303(d) listing. Data collected by parties outside the MPCA may be used as long as it meets acceptable QA/QC standards.

A list of "eligible" lakes to be evaluated for the 2006 Impaired Waters List has been prepared. For this listing cycle, MPCA included all lakes that had at least 10 TP, 10 chlorophyll-a, and 10 Secchi measurements.

The Delisting Process

In general, a waterbody will be assessed for delisting using the same standards, guidelines and thresholds that were used to place it on the Impaired Waters List initially. However, MPCA has set a somewhat higher bar for delisting waters by requiring more sampling data than is required for the listing process, and reviewing whether strategies that could lead to restoration have been accomplished. This is done to ensure that a waterbody is not de-listed prematurely or without solid supporting evidence.

The Basin Coordinator and Project Manager (PM) should serve as "champions" during the delisting process.

Identifying Candidates for the Delisting Process

Consider delisting a waterbody when these criteria are met:

- New and reliable data shows no impairment, and
- action in the watershed is of sufficient dimension to change impairment status.

How can Waterbodies be Removed from the Impaired Waters List?

There are three basic ways in which waterbodies can be removed from the Impaired Waters List:

1. When new and reliable data or information indicates a waterbody is no longer impaired and is meeting water quality standards, the waterbody could be delisted before a TMDL study is developed.

2. When a TMDL study and preliminary implementation plan that will reduce sources of pollution and restore beneficial uses is completed and subsequently approved by EPA.

3. When the sources of impairment are determined to be essentially natural in origin and not caused by human activities (are non-anthropogenic).

Funding Available for Monitoring Needed to Support the Delisting Process

A local Project Manager or MPCA staff who believes that one or more of the listed reaches in their jurisdiction is no longer impaired and should be delisted must provide MPCA with the necessary data to support a change in the impairment determination.

Data collection to support delisting a waterbody can be costly; however, limited funding is available from the MPCA to conduct this work. To be considered for funding, Project Managers should write a proposal that describes the data collection work that will be done and the expected cost of those activities. MPCA will include these proposals as part of the TMDL work plans that will be considered for funding during the upcoming Section 319 grant cycle.

MPCA also has an existing budget for laboratory work at the Minnesota Department of Health (MDH) lab that can be used throughout the year. If the only funds needed for a proposed delisting are for laboratory work at MDH, the MPCA can usually accommodate those expenses given adequate funds are available. The Project Manager should provide a written proposal to the MPCA describing the monitoring that will be done, and the expected laboratory costs. The final proposal should be sent to Celine Lyman of the MPCA for consideration.

Preparing Documentation to Support the Delisting Process

If you are interested in delisting a waterbody, schedule the potential delisting according to the biennial listing cycle. Delisting reviews will be conducted every year, either immediately following the Professional Judgment Team meetings, or in interim (non-assessment) years, usually beginning in May with final decisions made in June or July.

Delisting reviews in interim years will be reflected in the next assessment cycle. For example, delisting reviews in 2007 will be reflected in the 2008 TMDL list, while reviews in 2008 will be reflected in 2010, etc.

Before submitting a request to delist a waterbody from the Impaired Waters List, it is important to collect the appropriate documentation.

Follow these steps as you develop your case:

1. Collect appropriate data to support delisting process. Consider:

   - The minimum number of observations necessary as specified in the *Guidance Manual for Assessing Quality of Minnesota Surface Waters, Section X. Removal of Waterbodies* from the Impaired Waters List

- The time period (number of years) over which samples were taken (generally, at least 2 years of new data must be collected)
- The time of year and time of day that samples were taken
- Sampling locations in relation to the original listing data
- Assurance that new data was collected under similar or critical conditions (to original listing data)

2. Ensure that relevant data is available to the Delisting Committee:
   - All water quality data should be fully documented and entered into STORET,
   - Data should be verified and a Quality Assurance Performance Plan (QAPP) should be on file
   - Include flow data (USGS, HYDSTRA, or other)
   - Include other relevant data (temperature, rainfall, continuous monitoring data-loggers, NPDES monitoring data, weather records, etc.)
   - Point source data/information should be included, if applicable
   - Document changes or activities in the watershed that are likely to lead to a change in impairment status (e.g. point source improvements, dam removal, feedlot enforcement, BMP implementation, etc.)

3. Project Managers should submit delisting candidates to the Basin Coordinator

4. For each waterbody, submit the following information:
   - AUID (Assessment ID number)
   - Reach name/description
   - Pollutant/Impairment
   - Year first listed
   - Brief summary of the reasons delisting has been requested
   - Name of MPCA contact

5. Basin Coordinators should then:
   - In **assessment years** (odd numbered), identify delisting candidates during the professional judgment group meetings.
   - In **interim years** (even numbered): submit a complete list to the Delisting Committee **by no later than April 15.**

Basin Coordinators and/or PM 'champions' will likely be asked to participate in Delisting Committee meetings for individual AUIDs. The delisting decisions are sent to MPCA Basin Coordinators or a Technical Team Lead and watershed project staff.

What Happens After a Waterbody is Delisted?

Just because a waterbody is taken off the 303(d) List does not necessarily mean that the waterbody is meeting water quality standards. A waterbody may be removed from the 303 (d) List once a TMDL study has been approved by the MPCA and EPA.

It may take years of effort to bring a waterbody in line with standards. Therefore, it is important for sponsors to know that when the TMDL study is approved, significant work may still lie ahead.

MPCA's Timeline for Delisting Waters

Table 3-2 Delisting Timelines for Odd & Even- numbered Years

Assessment Years (odd-numbered)	
Call for data	December 1 (even #years)
Deadline for data verification	January 15 (odd # years)
Professional Judgment Group meetings	March–April (odd #years)
Delisting Committee review/meetings	May–June (odd #years)

Interim Years (even-numbered)	
Internal call for data	February 1
STORET data submittal due	February/March
Deadline for data verification	April 15
Request for delisting candidates	April 1
Data review and analysis	April–June
Documentation and communication	July

Delisting recommendations resulting from these reviews are reflected in the Impaired Waters List which is published during the next even-numbered year (2008, 2010, etc.).

Delisting can occur before a TMDL Implementation Plan is completed. It can be conducted as part of the assessment cycle, following the Professional Judgment Team assessments, but before the public comment period on the Draft Impaired Waters List. See Table 3-2 above.

MPCA's Delisting Review Committee

As of the printing of this manual, MPCA staff on the Delisting Review Committee include:

Carol Sinden
Doug Hall
Louise Hotka
Celine Lyman
Dave Christopherson
Steve Heiskary (lake assessments)
Scott Niemela (biological assessments-fish)
Mike Feist (biological assessments-fish)
Joel Chirhart (biological assessments-invertebrates)
(Other staff as needed)

Data Resources

- Water Quality Assessment Viewer
- http://pca-gis03/website/umrb/pig/index.htm
- Lookup Assessment Database:
  X:\Databases\Water_Quality\Assessment Data Lookup
  Contact your MPCA Technical Team Lead for more information.
- Data summaries for AUIDs listed 1992-1998

Summary

- Water Quality standards provide the guidelines by which state waterbodies are determined to be impaired
- Water Quality standards also guide the removal of waterbodies from the Impaired Waters List
- The availability of good quality data sets ensures that accurate determinations of impairment are made (must be in STORET)
- There is inherent uncertainty in all impairment decisions, though MPCA works to minimize uncertainty by using a weight-of-evidence approach
- There is a specific process and timeline in place for delisting waters
- Basin Coordinators should be the champions for the delisting process

Resources

Contact:

Howard Markus, MPCA, Biological Monitoring 651-296-7295
Steve Heiskary, MPCA, Lake Monitoring..... 651-296-7217
Celine Lyman, MPCA, TMDL Program Administrator 651-296-8798