

Wisconsin Department of Natural Resources 2006 Methodology for Placing Waters on Impaired Waters List

(Revised May 2006)

Impaired waters are those waters that are not meeting state water quality standards as defined by Section 303(d) of the federal Clean Water Act. Every two years, states are required to submit a list of impaired waters to the United States Protection Agency (U.S. EPA) for approval. The Wisconsin Department of Natural Resources (the Department) previously submitted lists to U.S. EPA in 1998, 2002, and 2004. U.S. EPA did not require and the Department did not submit a list in 2000. In submitting its 2006 list, the Department followed guidance issued by U.S. EPA in July 2005.

U.S. EPA requires that each state document the methodology used to add or delete waters from the existing “303(d) List.” A water body or segment of a water body is added to the list because it is not meeting water quality standards or because water quality is threatened. Waters that are removed from the list (“de-listed”) must have data to support the fact that they are now meeting water quality standards.

Chapter 281 of the Wisconsin Statutes authorized the Department to establish water quality standards that are consistent with the Federal Clean Water Act (Public Law 92-500). These water quality standards are explained in detail in Chapters NR 102, NR 103, NR 104, NR 105, and NR 207 of the Wisconsin Administrative Code. Water quality standards are the foundation of the Wisconsin’s water quality management program and they serve to define the goals for a water body by designating its uses, setting criteria to protect those uses, and establishing provisions to protect water quality from pollutants.

- A. **Three Elements of Wisconsin Water Quality Standards:** The water quality standards described in the Wisconsin Administrative Code all rely on three elements to collectively meet the goal of protecting and enhancing the state’s surface waters:
1. **Designated Uses:** These are the goals or intended uses for surface water bodies in Wisconsin (e.g., recreation, water supply, aquatic life, etc...). The following designated uses are described in Chapter NR 102 (Wis. Adm. Code):
 - a) **Recreational Use** – All surface waters are considered appropriate for recreational use unless a sanitary survey has been completed to show that humans are unlikely to participate in activities requiring full body immersion.
 - b) **Public Health & Welfare** – All surface waters are considered appropriate to protect for incidental contact by humans. Some are even protected further since they serve as a drinking water supply to nearby communities.
 - c) **Wildlife** – All surface waters are considered appropriate for the protection of wildlife that rely directly on the water to exist or rely on it to provide food for existence.
 - d) **Fish & Aquatic Life** – All surface waters are considered appropriate for the protection of fish and other aquatic life. Surface waters vary naturally with respect to factors like temperature, flow, habitat, water chemistry, etc.. This variation allows

different types of fish and aquatic life communities to be supported. Currently, Wisconsin recognizes the following sub-categories of the fish and aquatic life use designation:

- (1) **Coldwater Community:** Streams capable of supporting a cold water sport fishery, or serving as a spawning area for salmonids and other cold water fish species. Representative aquatic life communities associated with these waters generally require cold temperatures and concentrations of dissolved oxygen that remain above 6 mg/L. Since these waters are capable of supporting natural reproduction, a minimum dissolved oxygen concentration of 7 mg/L is required during times of active spawning and support of early life stages of newly-hatched fish.
- (2) **Warmwater Sport Fish Community:** Streams capable of supporting a warm water-dependent sport fishery. Representative aquatic life communities associated with these waters generally require cool or warm temperatures and concentrations of dissolved oxygen that do not drop below 5 mg/L.
- (3) **Warmwater Forage Fish Community:** Streams capable of supporting a warm water-dependent forage fishery. Representative aquatic life communities associated with these waters generally require cool or warm temperatures and concentrations of dissolved oxygen that do not drop below 5 mg/L.
- (4) **Limited Forage Fish Community:** Streams capable of supporting small populations of forage fish or tolerant macro-invertebrates that are tolerant of organic pollution. Typically limited due to naturally poor water quality or habitat deficiencies. Representative aquatic life communities associated with these waters generally require warm temperatures and concentrations of dissolved oxygen that remain above 3 mg/L.
- (5) **Limited Aquatic Life Community:** Streams capable of supporting macro-invertebrates or occasionally fish that are tolerant of organic pollution. Typically small streams with very low-flow and very limited habitat. Certain marshy ditches, concrete line-drainage channels, and other intermittent streams. Representative aquatic life communities associated with these waters are tolerant of many extreme conditions, but typically require concentrations of dissolved oxygen that remain above 1 mg/L.

2. **Water Quality Criteria:** These are the specified numeric or narrative requirements relating to each of the use designations recognized by Wisconsin. Each designated use has its own set requirements that must be met to protect the intended use. Some of these requirements relate to the amount of a pollutant that can exist without causing harm. Other requirements relate to the minimum concentration of a chemical compound or a species of bacteria. Yet others are set so that a physical measurement like temperature or pH are not allowed to reach a level that cause problems.

These requirements are expressed as water quality criteria. They may be narrative in nature and describe in a qualitative manner the conditions that should be achieved (e.g., no floating debris, scum, etc. that interfere with public rights). Alternatively, criteria may be quantitative and be expressed as a particular concentration of a substance or an

acceptable range for a substance (e.g., concentration of copper shall not exceed 19 ug/L, pH shall be from 6-9 s.u.). Wisconsin's water quality criteria are found in Chapters NR 102 and NR 105 of the Wisconsin Administrative Code.

- 3. Antidegradation:** This policy is intended to maintain and protect existing uses and high quality waters. This part of a water quality standard is intended to prevent water quality from slipping backwards and becoming poorer without cause, especially when reasonable control measures are available. The antidegradation policy in Wisconsin is stated in s. NR 102.05(1) (Wis. Adm. Code):

“No waters of the state shall be lowered in quality unless it has been affirmatively demonstrated to the Department that such a change is justified as a result of necessary economic and social development, provided that no new or increased effluent interferes with or becomes injurious to any assigned uses made of or presently possible in such waters.”

B. Waters to be Included on the 303(d) List:

- 1. Waters Not Meeting Water Quality Standards:** Waters not meeting water quality standards are to be included on the impaired waters list. A water quality standard is not met under two conditions—either the current water quality does not meet the numeric or narrative criteria or the designated use that is described in the Wisconsin Administrative Code is not being achieved.

- a) Excursions from Numeric or Narrative Water Quality Criteria

A water may be considered to be impaired if a numeric or narrative water quality criterion is not met. These criteria are specified in Chapters NR 102, 103 and 105 of the Wisconsin Administrative Code for water quality indicators and/or several pollutants. For example, Wisconsin's numeric water quality criteria state that a stream that supports a warm water sport fish community should be able to maintain a minimum dissolved oxygen concentration of 5.0 mg/L. In contrast, a stream that supports a cold water community may not be able to tolerate anything less than 7.0 mg/L during times or spawning or during the egg incubation period for many species of fish.

In the example above, dissolved oxygen is not a pollutant. Instead, it is an indicator value that changes when the level of pollution in a stream changes. In the case of dissolved oxygen, a lower number or concentration generally indicates stress and infers that there is less oxygen available to fish and other aquatic life that live in the stream.

Except where alternative procedures are specified in administrative rules, Department staff review all available data relating to numeric and narrative criteria to determine if those criteria are not being met. Staff takes into account the following:

- (1) The applicability of data to critical periods. For example, data collected during summer months are most appropriate for lakes with severe algae conditions.
- (2) The frequency and duration of a criteria violation. In some cases, there is a natural variability that occurs that may cause criteria not to be met for a short period of time. In other cases, an “event” such as a large amount of runoff during a rainfall or snowmelt may cause a periodic excursion from a criterion.
- (3) The likelihood of stress on aquatic communities, including fish, insects, mussels, snails, plants, etc..

Once again, the case of dissolved oxygen data provides a good a way of describing how the factors of frequency, duration and magnitude may result in a decision about whether or not to include a water body on the impaired waters list. In water bodies where measured dissolved oxygen is very low (*magnitude*) and data are available to indicate this occurs often (*frequency*), the Department would be inclined to recommend a water as “impaired.” In some cases, the time in which the dissolved oxygen actual falls below the criterion may be measured in minutes (*duration*) while at others, it could occur for hours at a time. This is not uncommon for those streams that exhibit what is known as a “diel” fluctuation. This occurs in streams where higher densities of plants and algae create very high concentrations of dissolved oxygen during the day when photosynthesis is active, but the concentrations drop to very low levels at night into dawn when respiration is consuming oxygen instead of producing it. Diel fluctuations may occur regularly during a summer – especially in waters where there may be excessive nutrients. Such diel fluctuations coupled with exceedances of high magnitude may cause stress on the aquatic community and result in the Department recommending the water as “impaired.” On the other hand, the Department may not recommend a water for listing when data are available that indicate that dissolved oxygen concentrations below the criterion occur very infrequently and only last for a short amounts of time. This is not uncommon when a stream receives stormwater runoff during a rainfall or snowmelt event. In these cases, the stress to aquatic life may be minimal.

In all cases, Department staff will look for corroborating information, such as the various biological indexes that can be used to measure stress within a fish and aquatic life community. Data indicating the type and number of species of fish, macro-invertebrates (e.g., insects, snails, etc.), plants, algae, are evaluated. Water chemistry data such as dissolved oxygen, pH, temperature, or toxic substances are also considered. If the suite of available data does not strongly suggest an impairment, then the water body may not be listed, but will be recommended for additional monitoring as resources allow. The Department will provide a rationale for those cases where data are available that indicate that a water quality criterion has been exceeded, but the water body has not been recommended for the impaired waters list.

b) Designated Uses Not Being Achieved

The *use designation* of a lake or stream is identified by a specific citation in ch. NR 102 or NR 104 (Wis. Adm. Code). In some cases, the specific water body is named – a common feature of the waters listed in ch. NR 104. In other cases, it may be

codified by reference – especially for coldwater communities that are referenced in what is commonly referred to as the *1980 Trout Book* (Wisconsin Trout Streams – Publication 6-3600(80)). Lastly, those water bodies with no reference are considered to be “default” waters and are assumed to support either a coldwater community, a warmwater sportfish community, or a warmwater forage fish community depending on water body-specific temperature and habitat limitations.

For purposes of the 2006 303(d) list, where a “default” fish and aquatic life use designation is applicable, the particular sub-category will be determined as follows:

- (1) For waters identified by the Department as Class I or Class II trout streams, a sub-category of coldwater community will be used as the designated use. The list of applicable streams is included in a Department publication entitled “*Wisconsin Trout Streams*” (WDNR publication FH-806-202). This publication is also available for viewing on the Department’s website at:

<http://www.dnr.state.wi.us/org/water/fhp/fish/pubs/troutstreams.pdf>

- (2) All other waters, including those waters listed as Class III trout, will be considered the equivalent of a warmwater community.

Assignment of a designated use for the protection of fish and aquatic life has been an iterative process dating back to the late 1960’s. While the Department strives to maintain a *contemporary* list of designated uses, it cannot visit each stream, river, or lake very often. In fact, many of the designated uses that are included in the Wisconsin Administrative Code date back to the 1980’s.

To facilitate the determination of a designated use to reflect the most current understanding of stream/river ecology, the Department published updated guidance in 2004. This guidance is included in a document entitled: “*Guidelines for Designating Fish and Aquatic Life Uses for Wisconsin Surface Waters*” (WDNR December 2004, PUBL-WT-807-04).” The guidance is used by biologists who monitor Wisconsin’s stream and river communities. It provides a framework for the collection and assessment of field data to recommend which fish and aquatic life category or sub-category a particular water body or segment best fits. Some of the community features that are used in making these recommendations are included in Table 1. (Note: Table 1 is a modified version of Appendix 2 from the 2004 Use Designation Guidelines.)

Department biologists conduct field studies to document the condition of a lake, river, and stream. These field studies include, but are not limited to the collection of community data for fish, macro-invertebrates, plants, algae, and bacteria. They collect data on water chemistry, flow, temperature, habitat conditions, and even surrounding land use. With these data in hand, Department staff can document whether or not a use is being met by comparing what is present to what is expected in a water body with a particular use designation. For purposes of determining whether a designated use is being met, the following procedure is used:

Table 1. Example Guidance for Fish & Aquatic Life Use Sub-Category Minimum Expectations. Modified from Appendix 2 of “*Guidelines for Designating Fish and Aquatic Life Uses for Wisconsin Surface Waters*” (WDNR December 2004, PUBL-WT-807-04)

Fish & Aquatic Life Sub-Category Current Name (Proposed Name) ¹	Minimum Dissolved Oxygen	MINIMUM STREAM COMMUNITY EXPECTATIONS
COLDWATER COMMUNITY (Coldwater A)	6 mg/L or 7 mg/L (During Periods Of Spawning & Nursery Activity)	<p style="text-align: center;">Potential to meet all expectations</p> <ol style="list-style-type: none"> 1. Naturally reproducing salmonid community containing more than one age group above the age of 1 year. 2. Year-to-year salmonid survival. 3. Will typically maintain good water quality and habitat. 4. Generally continuous stream flow. 5. More than 2 individual salmonids per 100 meters. 6. Maximum daily mean temperature approximately 22°C (77°F).
COLDWATER COMMUNITY (Coldwater B)	6 mg/L	<p style="text-align: center;">Potential to meet all expectations</p> <ol style="list-style-type: none"> 1. No natural salmonid reproduction with community sustained by stocking or migration. 2. More than 2 individual salmonids per 100 meters. 3. Will typically maintain good water quality and habitat. 4. Maximum daily mean temperature approximately 22°C (77°F).
WARMWATER SPORT FISH COMMUNITY & WARMWATER FORAGE FISH COMMUNITY (Diverse Fish & Aquatic Life)	5 mg/L	<p style="text-align: center;">Potential to meet one or more expectations</p> <ol style="list-style-type: none"> 1. Game fish community with more than 2 individuals per 100 meters (except Green Sunfish, Black Bullheads and Yellow Bullheads). 2. Non-game fish community with 5 to 25% or more of the individuals present characterized as being not tolerant of low dissolved oxygen. 3. Macroinvertebrate community with a significant number of individuals (5 to 25% or more) belonging to taxa with HBI tolerance values of 5 or less. 4. Any fish, macro-invertebrates or other aquatic, or semi-aquatic species listed as endangered, threatened or special concern species.
LIMITED FORAGE FISH (Tolerant Aquatic Life)	3 mg/L	<p style="text-align: center;">Potential to meet one or more expectations</p> <ol style="list-style-type: none"> 1. No potential to meet above criteria. 2. Non-game fish community dominated by individuals (75 to 100%) belonging to species that are tolerant to low dissolved oxygen. 3. Macroinvertebrate community with a significant number of individuals (numerically 75 to 100%) belonging to species with HBI tolerance values of greater than 5.
LIMITED AQUATIC LIFE (Very Tolerant Aquatic Life)	1 mg/L	<ol style="list-style-type: none"> 1. No potential to meet the above criteria. 2. No potential to contain a fish community. 3. Any macroinvertebrate community is dominated (75 to 100%) by individuals belonging to species with an HBI tolerance value of greater than 8.

¹ Department guidance suggests that new names for fish and aquatic life use sub-categories may be included in future revisions to Ch. NR 102, Wis. Adm. Code. Until any new names are promulgated in code, current names will be used.

Department biologists conduct field studies to document the condition of a lake, river, and stream. These field studies include, but are not limited to the collection of community data for fish, macro-invertebrates, plants, algae, and bacteria. They collect data on water chemistry, flow, temperature, habitat conditions, and surrounding land use. With these data, Department staff can document whether or not a use is being met by comparing what is present to what is expected in a water body with a particular use designation. For purposes of determining whether a designated use is being met, the following procedure is used:

The *existing use* is compared to the codified designated use. By definition in the Clean Water Act, the existing use is the attained use in the specific water body on or after November 28, 1975.

- Water quality standards ARE NOT being met if data are available that show that the existing water quality is not supporting the designated use. This could be indicated by a fish & aquatic life community being present that is not representative of the type of community that would be expected. This could be indicated by finding a chemical in the water that is persistent and not within the acceptable range for a particular use. Regardless, if it is demonstrated that the existing use is not achieving the goals of the designated use, the Department will recommend that water body for inclusion on the impaired waters list.
- Water quality standards ARE being met if data are available that show that the existing water quality is supporting a codified designated use. These waters will be recommended for inclusion on the impaired waters list.

2. **Threatened Waters:** The Clean Water Act also requires each state to identify any surface waters that are “threatened” if there are reasons to believe that the water body will not meet water quality standards by the next 303(d) listing cycle. The applicable federal requirements for this category are described in 40 CFR 130.7(b)(4) where it is stated that all water quality-limited segments are to be included on the 303(d) list. A water quality-limited segment is defined in 40 CFR 130.2(j) as a water body “where it is known that the water quality does not meet applicable water quality standards and/or is not expected to meet applicable water quality standards.” In the “National Clarifying Guidance for 1998 State and Territory Clean Water Act Section 303(d) Listing Decisions,” U.S. EPA indicated that a reasonable time frame for considering a water body threatened for purposes of listing would be the next listing cycle.

To determine which waters meet this federal definition, the Department reviews “State of the Basin Reports” from throughout the state to flag all waters noted by field staff as being “threatened” with a “declining trend.” Staff may have identified these waters because of known changes in the watershed that have the potential to increase pollutants in the water. Some of the noted changes may be temporary (e.g., road maintenance) while others may be permanent (e.g., major changes in land use).

Characterization of a water body with a “declining trend” can only be determined through actual water quality monitoring. A *trend* cannot be determined without having a minimum of two sets of site-specific data. Therefore, waters identified as having a “declining trend”, but lacking adequate data will not be considered further. For those waters where adequate data are available, Department staff will then use appropriate

evaluation methods and professional judgment as to whether water quality standards will be exceeded prior to the next listing.

C. Waters Not to be Included on the 303(d) List: In the watershed tables included in State of the Basin Reports, many water bodies are characterized as *partially* meeting water quality standards. These waters appear to have water quality conditions that meet the minimum requirements for a designated use. However, it may be possible that implementation of certain stream management practices may enhance the overall ecological condition of some of these water bodies.

NOTE: The Department definition of “*partially meeting*” differs from the federal definition which uses partially meeting as a degree of *non-attainment*. In Wisconsin, partially meeting describes a degree of attainment and does not suggest that a water quality standard is not being achieved.

D. Data Quality

- 1. Information Used to Add Waters to List or to De-List:** Information used for purposes of listing must be consistent with the Department’s Quality Management Plan or have been obtained using comparable quality assurance/control procedures. For information to be used for the 303(d) list, it must also meet the criteria for monitored data. Monitored data are site-specific and considered representative of 2006 conditions, even if the data are more than five years old.

In general, “monitored” information contained in the most recent State of the Basin Report will be used, unless more recent information is available. The State of the Basin Reports identify streams as monitored if the data are no more than five years old when the report was prepared. (The actual publication date may be one to two years later than the preparation date.) That is, a State of the Basin report prepared in 1999 will identify data collected since 1994 as “monitored” data.

In preparation of the 2006 list, much of the “monitored” information in the State of the Basin Reports will be older than five years. This information will be used unless Department staff determine that it is no longer representative. Department staff will determine if changes in the watershed have occurred, such as significant changes in the land use, detrimental changes in the level of nonpoint source management or increases in the amount of pollutants discharged from point sources. If significant changes have not occurred, the information will be used.

Since the Department completed its efforts to submit the 2004 List of Impaired Waters, it has modified its statewide comprehensive monitoring strategy. This document, entitled *Water Resources Monitoring Strategy for Wisconsin Version 1 (February 4, 2005)*, is available for review on the Department’s website at:

<http://dnr.wi.gov/org/water/monitoring/MonitoringStrategy.pdf>

The Department’s Water Monitoring Strategy (*Strategy*) directs monitoring efforts in a manner that efficiently addresses the wide variety of management information needs, while providing adequate depth of knowledge to support management decisions. The Strategy employs a tiered approach to information gathering, outlined below. This

careful investment in monitoring effort insures that the status of Wisconsin's water resources can be determined in a comprehensive manner without depleting the capacity to conduct in-depth analysis and problem solving where needed. The tiers of the Strategy are:

- a) Tier I – Statewide Baseline Monitoring: Tier I employs an initial economical set of standardized sampling protocols to collect statewide data. This ensures broad spatial coverall of all aquatic resources and is designed to identify broad trends and waters with environmental problems.
- b) Tier II – Targeted Evaluation Monitoring: Where environmental problems are found or suspected through Tier I, more intensive sampling may occur under Tier II to determine the cause and extent of the problem. This site-specific monitoring of targeted areas can be used to help determine if waters should be considered for the 303(d) list and to development management plans for corrective action where necessary.
- c) Tier III – Management Effectiveness and Compliance Monitoring: Tier III employs follow-up studies on targeted waters to determine the success of management actions. Tier III monitoring is also used to evaluate levels of compliance of facilities regulated for effluent discharges to waterways, and determine effectiveness of permit conditions in protecting water quality.

In addition to Department-generated data, the Department will seek information from federal agencies, such as the U. S. Geological Survey (USGS), U.S. EPA and the U.S. Fish & Wildlife Service, other state agencies and universities, regional planning commissions and major municipal sewerage districts. The Department will send a letter to interested parties requesting notification of applicable data no later than September of the year prior to the list submittal (e.g. 2005 for the 2006 list). If an agency has applicable data, Department staff will review the data, the procedures used to collect the data and the procedures used to analyze the data. It is further expected that the Department will review information reported by USGS in that agency's annual Water Resources Data Reports.

The Department will review information provided by any individual or group at any time. Data used for listing purposes must have been obtained using adequate quality assurance/control procedures. Outside agencies submitting data must show that a minimum number of samples were collected at appropriate sites and at critical periods, and that certified laboratories were used for sample analysis. If the Department deems that the information indicates that an impairment is likely, but the quality assurance/control procedures are not adequate, staff will consider collecting additional data in order to list the water body in the future. The Department may also assist outside groups in the data quality procedures that are necessary for data to be used by the Department. It is important to note that Department staff will consult with U.S. EPA water quality criteria guidance and use professional judgment to interpret results of field sampling to determine whether or not water quality standards are being achieved.

2. **Information Not Used to Add Waters to List or to De-List:** Information that is not considered representative of 2006 conditions or that does not meet the intent of the Department's Quality Management Plan cannot be used in preparation of the 303(d) list.

This includes information contained in the watershed tables of the State of the Basin Reports considered to be “evaluated” and not monitored. Evaluated situations are those where:

- a) Information is provided by groups, other agencies or individuals where the quality of the data cannot be assured.
 - b) Projected stream or lake conditions based on changes in land use only (no corresponding in-water data).
 - c) Visual observations that are not part of a structured evaluation; and
 - d) Anecdotal reports.
3. **Previously Listed Waters:** Unless a water body is proposed to be de-listed, all previously listed waters will remain on the list even if the water no longer meets this methodology. A water body will not be proposed to be taken off the list until the Department has an opportunity to monitor the water or has access to contemporary, representative, and high quality data that warrant a “de-listing.”

E. Methodology Specific to Categories

1. **Atmospheric Deposition:** This category includes waters with fish consumption advisories caused by atmospheric deposition of mercury. To a very limited extent, it also includes waters with advisories due to polychlorinated biphenyls (PCBs) where there are no discrete sediment deposits. In 1998, 241 waters were listed in this category. In 2002, in accordance with U.S. EPA guidance, the Department switched to a statewide consumption advisory (See “Safe Eating Guidelines”) that categorically recognized the potential for certain contaminants to be present in fish tissue. This approach is very conservative and is an acknowledgement that the Department cannot sample fish from every lake or stream in the state. That same year, the Department listed 92 waters specifically for mercury since actual measurements of mercury in fish tissue were available. In 2006, 26 waters are proposed to be de-listed for Hg or PCBs based on new data. The Department will continue to add waters to the 303(d) list that are listed in the latest fish consumption advisory publication, and de-list those where the specific advisory no longer applies.

When water body specific data are available for certain game and panfish species, the Department will use the following fish consumption program guidance to include those waters on the impaired waters list:

- a) *Mercury:* if a water body has special mercury based consumption advice of one meal per month or less frequent for panfish (applied when panfish concentrations reach 0.21 to 1 ppm, parts per million), or is ‘do not eat’ for gamefish (applied when gamefish concentrations exceed 1 ppm).
- b) *Polychlorinated Biphenyls (PCB):* if a water body has special PCB-based fish consumption advice of one meal per month or less frequent (applied when PCB concentrations reach total PCB concentrations in the range of 0.21 ppm to over 2 ppm).

- c) *Dioxin & Furan Congeners*: if a water body has special dioxin/furan based advice of “Do Not Eat” (applied when dioxin equivalents exceed 10 ppt (parts per thousand) based on 2,3,7,8-substituted dioxin and furan congeners).

In preparing the Wisconsin fish consumption advisory, Department staff uses advisory protocols to evaluate fish contaminant data and, in general, the following ranges of concentrations for the advisory categories. Waters that will be added to the 303(d) fit into the criteria highlighted in the grey boxes.

Mercury Concentration in Fish (ppm)

Consumptive Advice -- Sensitive Group	Unlimited	1 meal/week	1 meal/month (panfish)	Do not eat (gamefish)
Range	< 0.05	0.05 – 0.22	0.22 – 1.0	>1.0

Total PCB Concentration in Fish (ppm)

Consumptive Advice	Unlimited	1 meal/week	1 meal/month	1 meal/2 months	Do not eat
Range	< 0.05	0.06 – 0.2	0.21 – 1.0	1.1 – 1.9	>2

Dioxin and Furan Congeners (ppt)

Consumptive Advice	No advisory	Do Not Eat
Range	< 10	> 10

More information about the specific fish consumption advisory can be found in the publication, Choose Wisely, A Health Guide for Eating Fish in Wisconsin (PUB-FH-824 2005). <http://dnr.wi.gov/org/water/fhp/fish/pages/consumption/choosewisely05.pdf>

Specific waters will be proposed for de-listing where fish are collected and analyzed but no longer meet the criteria for specific fish consumption advisories for mercury or PCBs. The general, statewide fish consumption advisory will still apply to these waters.

2. **Contaminated Sediment:** The Department will include those water bodies with sediment deposits that are known to have toxic substances that exceed state water quality criteria for ambient water as specified in ch. NR 105, (Wis. Adm. Code). These waters may be identified through various monitoring activities, including those routine water quality monitoring, sediment core analysis, and even collection of fish tissue. In addition to a comparison to the water quality criteria found in NR 105, the Department compares actual sediment concentrations of pollutants to the guidance provided in a document prepared in 2002 entitled “Consensus – Based Sediment Quality Guidelines: Recommendations for Use and Application.” These guidelines identify the concentration of pollutants that will cause “probable effects” in biological organisms that occupy the contaminated sediment area.

3. **Physical Habitat:** This category includes waters where codified designated uses are not being met due to a physical structure, such as a dam. For example, if a codified designated use is not being met in an upstream segment due to the presence of a dam preventing fish movement, some portion of the segment is deemed to be impaired.

4. **Other:** This category includes beaches with chronic closure problems due to the presence of high counts of *E. coli* bacteria – a bacterium that serves as an indicator of fecal contamination. Although *E. coli* may not result in illness to humans, its presence suggests that fecal matter may be in the water and that other pathogens may be present. It is often these other pathogens that result in water borne illnesses in humans.

When evaluating *E. coli* data, Department staff will calculate a rolling geometric mean per U.S. EPA guidance when there are fifteen or more samples taken in a year. If there are less than 15 samples, the year is considered to have insufficient data. This data threshold was selected to represent the number of samples typically collected during a Wisconsin “beach season.” In Wisconsin, the typical swimming season lasts about 15 weeks – Memorial Day through Labor Day weekend. Samples are collected weekly during this time period for beaches that are heavily used. Stream and river samples were not considered due to limited data.

Waters are proposed to be added to the 2006 list where the rolling geometric mean exceeds the U.S. EPA threshold value of 235 cfu/100mL, or colony forming units per milliliter.

Years of Information Available	Beaches were listed if:
1 year of data	>35 % of samples collected exceeded 235 cfu/100mL
2 years of data	>25% of samples collected exceeded 235 cfu/100mL
3 years of data	>15% of samples collected exceeded 235 cfu/100mL

For the 2006 303(d) list, 115 Great Lakes Beaches and 43 inland beaches met the 15 samples per year minimum sampling requirement. Data were available for 2003, 2004 and 2005. Older data are available for areas near Milwaukee but were not considered in these analyses.

F. Priority for TMDL Development

When submitting the 303(d) list for approval by U.S. EPA, the Department must include a “priority rank” indicating the relative timeframe for when a Total Maximum Daily Load (TMDL) report will be developed. A TMDL is a report that show how much pollutant a

water body can receive without being adversely affected. Federal law requires that a TMDL be developed for each water body listed on an impaired waters list.

The 2006 303(d) list includes a rank of “*high*,” “*medium*,” and “*low*” for each water body identified by the Department. A ranking of “*high*” indicates likely completion of a TMDL within a two year period. A ranking of “*medium*” indicates likely completion of a TMDL within a two to five year period. A ranking of “*low*” indicates likely completion of a TMDL within five to 13 years.

Assignment of a priority rank will not always be straightforward, but will consider the following factors:

- 1. Availability of information:** A large amount of data are needed to develop a TMDL. Some waters already have water quality data that can be used while others have little to no data. Waters with the most readily available data will more likely have a TMDL developed within two years and assigned a “*high*” priority ranking.
- 2. Opportunities provided by other activities:** TMDLs can be sometimes be written using information generated by other water quality management programs such as priority watershed projects, Runoff Management Grants, and other monitoring efforts.
- 3. Likelihood to respond:** The Department considers the likelihood of the water body to respond to management actions when assigning a rank. In some cases, the success of a TMDL and the system response to management is dependent upon the type of impairment and the pollutant sources contributing to the impairment.
- 4. Severity of the impairment:** The Department will also consider the severity of the impairment and will consider that in assigning a priority. In some cases, extreme conditions may be present that need more rapid attention those that are not so extreme. Systems with frequent fish kills or other “*toxic*” events are examples of this concern.
- 5. Public health concerns:** Where it is feasible to affect a change in significant change water quality through the development and implementation of a TMDL, water bodies with fish consumption advisories, reports of illness to swimmers, etc. will be considered a high priority.

Given the number of factors and the varying importance between the short-term and the long-term reporting periods, the process used for assigning priorities is both complex and subjective. High priority waters for TMDL development can be characterized as waters where adequate information for TMDL development is available and generally takes advantage of opportunities provided by other activities. High priority and medium TMDLs will also take advantage of Tier I and Tier II monitoring occurring throughout the state.

In general, waters impaired by atmospheric deposition of mercury provide a special situation. Obviously, they are a public health concern and, therefore, should be addressed. However, in most cases, the solution is not a local site-specific solution but would involve national and international control of air emissions. Therefore, waters in the atmospheric deposition category are not considered appropriate for scheduling TMDL development at this time. During the interim, U.S. EPA has suggested that these waters be placed near the end of the TMDL development schedule, but no later than 13 years from the original listing.

G. Environmental Accountability Projects (EAPs)

Alternatives to a TMDL can be prepared for waters on the 303(d) list. These alternatives are referred to as “*Environmental Accountability Projects*” (EAPs). They are any planned action that will result in a significant reduction or altogether elimination of a pollutant loading that is contributing to the impairment for which a water body is listed. It is expected that implementation of this plan of action would result in the water body meeting standards.

Examples of these types of actions are nonpoint source projects/activities, remedial actions under superfund, or a dam removal. Acceptable EAPs must meet a minimum of nine required elements prescribed for water quality-based plans in federal program guidance for Section 319 of the Clean Water Act. Wisconsin currently has 13 waterbodies on the 303(d) list that may have an EAP prepared to address the specific pollutant and impairments instead of a TMDL.