

2015 – 2017 Triennial Review Topics for Ranking

| General Category | Topics to be ranked: | Description |
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| <p>Algal Water Quality Criteria and/or Guidance Development</p> | <p>Cyanobacterial Toxin and Cell Density Water Quality Criteria and/or Guidance</p> | <p>Cyanobacterial blooms create aesthetic and ecological problems in lakes, hinder recreational use, and if cyanobacterial toxins are produced, pose health risks to humans and animals exposed to the blooms. Wisconsin lacks formal guidance and criteria for cyanobacterial toxins and cyanobacterial cell densities. With only informal guidance available from the WDNR, public health efforts to educate and protect the public from cyanobacterial blooms in Wisconsin are piecemeal. Adopting the World Health Organization (WHO) recreational risk assessment guidelines on a provisional basis, drafting Wisconsin-specific recreational guidelines, or developing water quality criteria for cyanobacterial toxins and cell densities would give public health officials a tool and impetus to improve the protection of human and animal health. Provisionally adopting the WHO guidelines could alleviate challenges in quantitative cell and toxin density determinations, as the guidelines include qualitative assessments, which are correlated with quantified risk factors. These qualitative guidelines from the WHO offer public health officials a quick, easy way to assess risk from blooms. Adopting the WHO guidelines on a provisional basis, drafting Wisconsin-specific guidelines, or developing water quality criteria for cyanobacteria could give more impetus to local public health officials' roles in improving notification, education, and protection of the public in regards to cyanobacterial blooms.</p> <p>Related Rule(s): NR 102 Water quality standards for Wisconsin surface waters, NR 105 Surface water quality criteria for toxic substances, NR 809 Safe drinking water, NR 140 Groundwater quality.</p> |
| | <p>Nearshore Great Lakes Area Algae Standard, Including Cladophora</p> | <p>Develop algae standards for nearshore Great Lakes areas (Lake Michigan) in accordance with the recommendations of the International Joint Commission and the Great Lakes Water Quality Agreement protocols. For the past several years, large quantities of decaying algae, mostly Cladophora, have been fouling Wisconsin's Lake Michigan shoreline. Nuisance levels of algae at Great Lakes beaches may impair recreational uses of beach areas. Part of the standards could include development of a method to apply the narrative standards in s. NR 102.04(1) to assess Cladophora levels in order to identify recreational use impairments of Great Lakes beaches.</p> <p>Related Rule(s): NR 102 Water quality standards for Wisconsin surface waters</p> |

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| Use Designation | Public Health Designated Uses and Water Quality Criteria Revision | Update the Ambient Water Quality Criteria (AWQC) as part of each triennial review as new toxicological, exposure, and risk information becomes available (primarily those vetted and published in the Integrated Risk Information System (IRIS) database). Also, consideration should be given to adopting Maximum Contaminant Levels (MCLs) into standards to protect drinking water designated uses for those chemicals where no national 304(a) criteria exist. |
| | Wild Rice Designated Use Development | <p>Wild rice is an important ecological and cultural resource in Wisconsin, particularly in tribal areas. However, the distribution of wild rice has been greatly reduced from its historical range within the Great Lakes region and specifically within Northern Wisconsin and the Menominee Indian Reservation. In order to support the preservation and restoration of wild rice in Wisconsin, the WDNR should consider developing a wild rice designated use. Using such a designation – in addition to development of appropriate water quality criteria - would ensure that the water quality goals of the waterbody would support and maintain wild rice.</p> <p>Related Rule(s): NR 102 Water quality standards for Wisconsin surface waters, NR 104 Uses and designated standards, NR 207 Water quality antidegradation.</p> |
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| | Antidegradation Procedures Revision | <p>EPA has encouraged WDNR to review and revise its rules and implementation procedures to address 7 key areas of antidegradation: 1) public participation; 2) protection of existing uses; 3) definition of increased load; 4) threshold for determining significant lowering of water quality; 5) increased limits due to revised and less stringent water quality criteria; 6) criteria for determining necessary social & economic development; and 7) application of antidegradation to stormwater discharges. WDNR has acknowledged that revisions to policies/procedures may be needed. WDNR has reviewed the antidegradation policies from U.S. EPA/other Region 5 states to determine changes needed. Rulemaking will be necessary to formalize any revisions to policies/procedures.</p> <p>Related Rule(s): NR 102 Water quality standards for Wisconsin surface waters, NR 207 Water quality antidegradation.</p> |
| Procedure, Guidance Development or Revision | Industrial Stormwater Performance Standards Development | <p>Under current rules, both municipal separate storm sewer system (MS4) permittees and construction site permittees are required to meet established performance standards for storm water runoff quality. The performance standards are specified in ch. NR 151, Wis. Adm. Code, and are implemented through the MS4 and construction site storm water permit programs in ch. NR 216, Wis. Adm. Code. However, there are currently no performance standards in ch. NR 151 for industrial storm water runoff regulated under ch. NR 216. This topic would propose that the DNR consider developing performance standards, such as for total suspended solids, for industrial facilities regulated under ch. NR 216.</p> |
| | Watershed Permitting Development & Implementation Guidance | <p>WDNR currently issues individual WPDES (Wisconsin Pollutant Discharge Elimination System) discharge permits, but watershed based permits can facilitate permittees working together to improve water quality within a watershed. Create comprehensive guidance on how watershed permits might be used to help in the implementation of Total Maximum Daily Loads, Phosphorus standards, adaptive management, and water quality trading.</p> <p>Related Rule(s): NR 102 Water Quality Standards for Wisconsin surface waters; NR 217 Implementation of Phosphorus Standards in WPDES permits.</p> |
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| Total Maximum Daily Loads (TMDL) | TMDL Development Guidance | In 2013 the TMDL Development Guidance was revised. However, this guidance revision only included updates to TMDL <i>implementation</i> guidance. The TMDL <i>development</i> guidance in this document is extremely limited and has not been updated since its creation in 2011. There is still a need for comprehensive TMDL development rules and/or guidance. Related Rule(s): NR 102, Water quality standards for Wisconsin surface waters; NR 217, Implementation of phosphorus standards in WPDES permits. |
| | Implementation of Approved TMDLs | The WDNR has completed the general implementation guidance for TMDLs. The WDNR should now focus on specific TMDLs that have been approved and develop individualized implementation processes for each TMDL and make these available to the permittees. |
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| Water Quality Criteria Revision | Ammonia | In August 2013, EPA published national recommended ambient water quality criteria for the protection of aquatic life from the toxic effects of ammonia, a constituent of nitrogen pollution. Federal acute and chronic criteria were revised to take into account the sensitivity of mussels to ammonia. New toxicity data was used to calculate more restrictive criteria that was not used to develop Wisconsin's criteria. States are expected to revise their criteria in order to be protective of all aquatic organisms. Wisconsin has widespread occurrence of unionid mussels that are sensitive to ammonia. Therefore, the WDNR needs to review and possibly revise NR 105 to update the ammonia WQC to ensure protection of mussels as well as other aquatic organisms. Related Rule(s): NR 105 Surface Water Quality Criteria |
| | Acrolein | Acrolein is used as a pesticide to control algae, weeds, bacteria, and mollusks. It is also used to make other chemicals. Small amounts of acrolein can be formed and enter the air when trees, tobacco, other plants, gasoline, and oil are burned. EPA has published national recommended water quality criteria for the protection of human health for acrolein. These updated criteria are based on EPA's Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health (2000 Human Health Methodology) (EPA-822-B-00-004) and supersedes prior recommended criteria for this chemical. WDNR needs to revise their acrolein criteria to reflect EPA updates. Related Rule(s): NR 105 Surface Water Quality Criteria |

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| Water Quality Criteria Revision | Arsenic (Human Health Use) | <p>Arsenic is a naturally occurring element found in soil and minerals and has been used in a variety of products and industries (e.g., pesticides, wood preservation, paints) over the years. Arsenic can enter ground and surface waters through both natural (e.g., volcanic action, erosion of rocks, forest fires) and manmade (e.g., mining, spills, runoff) processes. The EPA has classified arsenic as a Class A human carcinogen meaning that there is “adequate human data to demonstrate the causal association of [arsenic] with human cancer.”</p> <p>In WI, the human cancer criterion (HHC) for arsenic is 0.2 pbb (NR 105.09). This criterion represents a 1 in 100,000 lifetime cancer risk and is based on the oral slope factor for skin cancer and drinking water and fish consumption rates. The HHC is a criterion for public health and welfare use and “shall be met regardless of whether the surface water is used for public drinking water supply or the applicable fish and aquatic life subcategory” (NR 102.04).</p> <p>The drinking water enforcement standard (NR 140.10) and maximum containment level (NR 809.11) is 10 ppb. This criterion was based on a number of factors including health risk (specifically bladder cancer), feasibility and cost of compliance, and natural occurrence of arsenic in drinking water. This criterion represents a 14/18 (females/males) in 10,000 for lung cancer and 12/23 (females/males) in 10,000 for bladder cancer.</p> <p>There are several issues with the criteria for arsenic: 1) the drinking water criteria are 50x higher than HHC even though the HHC accounts for drinking water consumption; 2) while both the drinking water criteria and HHC were calculated using EPA recommended approaches, they use different cancer slope factors. The slope factor for skin cancer was used for HHC while the slope factor for bladder cancer was used for the drinking water criteria; 3) there is an ongoing national debate as to how the oral cancer slope factor is determined, whether arsenic has a threshold effect dose, and how the lifetime cancer risk is calculated; 4) ambient water concentrations of arsenic in some surface waters exceed the HHC resulting in the need for WDPES variances for many systems.</p> <p>The water quality criteria for arsenic should be evaluated for consistency across the Department and with the EPA and to ensure that the criteria are based on the latest scientific knowledge.</p> <p>Related Rule(s): NR 102 Water quality standards for Wisconsin surface waters, NR 105 Surface water quality criteria and secondary values for toxic substances, NR 140 Ground Water Quality, NR 809 Safe drinking water</p> |

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| Water Quality Criteria Revision | Cadmium | <p>U.S. EPA has requested the WDNR evaluate cadmium criteria to ensure that Wisconsin's water quality criteria are consistent with federal criteria. Revisions to Chapter NR 105 are necessary to synchronize Wisconsin's toxic substance criteria with federal criteria promulgated by U.S. EPA. Proposed Revisions for cadmium are intended to provide appropriate protection for human health as well as fish and aquatic life for chemical species that are frequently detected in Wisconsin discharge water.</p> <p>Related Rule(s): NR 102 Water quality standards for Wisconsin surface waters</p> |
| | Chloride | <p>The Ohio WDNR has promulgated chloride criteria based on new toxicological data (from 2009) and are related to sulfate and chloride concentrations in waterbodies. The WDNR should review new toxicological data to ensure Wisconsin's chloride criteria are providing the appropriate level of protection for fish and aquatic life species. Many POTWs (Publicly-Owned Treatment Works) in Wisconsin are operating under chloride variances driven by the current method to determine acute and chronic criterion. Criterion developed based on hardness and sulfate concentrations may result in less stringent, but scientifically defensible criterion. This could reduce the need for utilizing chloride variances in discharge permits and allow both the WDNR and permittees to better target limited resources. Related Rule(s): NR 105 Surface water quality criteria for toxic substances.</p> |
| | Copper - Water Effects Ratio (WER)/Biotic Ligand Model (BLM) | <p>WDNR will work with the State Lab's Environmental Toxicology Section to collect toxicity test data to potentially redefine copper criteria in Northern and Western Wisconsin in an effort to reduce the copper variance workload. The lab will use Water Effects Ratio (WER) evaluations, which take into consideration specific physical and chemical characteristics of a waterbody in determining toxicity, and the Biotic Ligand Model (BLM), a metal bioavailability model, to determine appropriate copper criteria for these regions of Wisconsin. Related Rule(s): NR 105 Water Quality Criteria; s. 283.15, Wis. Stats., Variances to water quality standard.</p> |

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| Water Quality Criteria Revision | Dissolved Oxygen | <p>Wisconsin's minimum water quality criteria for dissolved oxygen (DO) were developed in the early 1970's and have not been updated since then. Several challenges to the appropriateness of the DO criteria have been made in formal and informal reviews of WPDES permits for wastewater treatment facilities. Most often the challenges surround the question of whether or not the DO criteria are adequately protective of threatened and endangered fish and other aquatic life species. Maintaining adequate concentrations of DO is vitally important for supporting fish, invertebrates and other aquatic life. Any effort to review the applicability of DO criteria would need to consider the multiple use designations currently a part of NR 102.</p> <p>Related Rule(s): NR 102 Water quality standards for Wisconsin surface waters, NR 104 Uses and designated standards, NR 212 Waste load allocated water quality related effluent limitations, NR 151 Runoff Management.</p> |
| | Endrin Chronic | <p>Endrin is used as an insecticide and rodenticide. It primarily enters waterbodies through application to soil in fields. The persistence of endrin in the soil led to a reduction of its use. EPA recommended criterion is 0.036 ug/L, and the Agency approved 0.036 ug/L in 2009. Wisconsin published a criterion of 0.05 ug/L. WDNR should consider revising their endrin criteria to protect warm water sport fish, warm water forage fish waters.</p> <p>Rule(s): NR 105 Surface Water Quality Criteria</p> |
| | Phenol | <p>EPA has published national recommended water quality criteria for the protection of human health for phenol. These updated criteria are based on EPA's Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health (EPA-822-B-00-004) and supersedes prior recommended criteria for this chemical. WDNR needs to revise their phenol criteria to reflect EPA updates. Related Rule(s): NR 105 Surface Water Quality Criteria</p> <p>http://water.epa.gov/scitech/swguidance/standards/criteria/health/phenol_index.cfm.</p> |

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| | Selenium | U.S. EPA has requested the WDNR evaluate selenium criteria to ensure that Wisconsin's water quality criteria are consistent with federal criteria. Revisions to Chapter NR 105 are necessary to synchronize Wisconsin's toxic substance criteria with federal criteria promulgated by U.S. EPA. Proposed Revisions for selenium are intended to provide appropriate protection for human health as well as fish and aquatic life for chemical species that are frequently detected in Wisconsin discharge water. Related Rule(s): NR 102 Water quality standards for Wisconsin surface waters |
| Water Quality Criteria Revision | Water Quality Criteria Frequency and Duration Requirements Development | For the most part, WDNR defines water quality criteria by the magnitude of the acceptable concentration, and explicit statements outlining the acceptable duration or frequency of digressions over those criteria are not included in the water quality standards. For some pollutants (e.g., fecal coliform bacteria), the acceptable frequency is expressed in the water quality standards. However, more commonly, the process of assessing ambient water quality against the applicable water quality criteria interprets acceptable occurrence of digressions through a guidance document, titled "Wisconsin Consolidated Assessment and Listing Methodology". It is recommended that duration and frequency be defined for each pollutant in the water quality standards in Wisconsin Administrative Code. |
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| Water Quality Criteria Development | Carbaryl | EPA recently published updated aquatic life criteria recommendations for carbaryl so WDNR should consider adopting a Carbaryl Water Quality Criteria. Carbaryl belongs to a family of chemicals that kill or control insects (insecticides) known as carbamates. Carbaryl is used to control a wide variety of pests, including moths, beetles, cockroaches, ants, ticks, and mosquitoes. Products with carbaryl can be formulated as dusts, wettable powders, liquid concentrates, granules, or baits. Carbaryl products are used on fruits, vegetables, rangeland, lawns, ornamental plants, trees, and building foundations. Related Rule(s): NR 105 Water Quality Criteria |
| | Floristic Quality Assessment - Numeric Benchmarks for Wetlands | Developing Floristic Quality Assessment benchmarks for evaluating plant community integrity for Wisconsin wetlands. This would be the first attempt at a numeric water quality standard, but not meant to replace the current narrative standard for floristic integrity. Minnesota and Ohio have standards for possible reference. |
| | Nitrogen | EPA water quality criteria guidance requires all states to develop nitrogen criteria as well as phosphorus criteria. Currently, WDNR regulates nitrogen only as a toxic substance through implementation of surface water quality standards for ammonia. However, nitrogen also acts as a nutrient for many plant species and can contribute to nuisance plant and algal growth in surface waters. The result of these conditions may be depletions of dissolved oxygen or extreme pH conditions – which are not supportive of balanced fish and aquatic life community. A review of nitrogen monitoring data may result in a need for nitrogen surface water quality criteria to complement criteria for phosphorus – the other nutrient associated with nuisance conditions in lakes, rivers, & streams. Related Rules: NR 102 Water quality standards for Wisconsin surface waters, NR 210 Sewage treatment works, NR 809 Safe drinking water, NR 140 Groundwater quality. |

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| Water Quality Criteria Development | Pesticides | <p>Pesticides have been implicated in a number of concerning environmental trends, including declines in pollinator populations, increasing soil and water contamination, and the buildup of persistent organic pollutants in the environment. Dispersion of pesticides to aquatic ecosystems is a particularly pressing issue that must be addressed. WDNR should consider adopt the existing aquatic life benchmarks for pesticides that have been compiled by EPA’s Office of Pesticide Programs. These benchmarks, which represent baseline risk assessments, present scientifically rigorous estimates of bio-toxicity thresholds of hundreds of registered pesticides to fish, invertebrates, and vascular and nonvascular plants. Pesticide concentrations below the “chronic” thresholds described in this dataset are not expected to harm aquatic life, and should represent starting points for developing pesticide water quality standards for the State of Wisconsin. Given the proliferation of novel pesticides and continual introduction of new chemicals in the realm of pest control, it is important for WDNR to harness existing EPA data to begin the process of defining pesticide water quality standards in the State. Related Rule(s): NR 105 Surface Water Quality Criteria</p> |
| | Sulfate | <p>Develop water quality criteria for sulfate in order to protect and restore Wisconsin’s wild rice population. Sulfate occurs naturally in mineral salts found in soil. Anthropogenic sources of sulfate include fossil fuel combustion, mining, gas processing, wastewater treatment, and other industrial facilities. Studies have shown that low aquatic sulfate levels (about 10 parts per million) provide good habitat for wild rice populations. Wild rice has a permanent, cultural and dietary importance to the indigenous communities and also provides subsistence for many Wisconsin residents and wildlife species. A recent collaborative study done by the Minnesota Pollution Control Agency (MPCA), Environmental Protection Agency (EPA) and Minnesota Department of Natural Resources (MN-DNR) examined the mechanisms by which sulfate impacts wild rice growth. In order to support the preservation and restoration of wild rice in Wisconsin, the WDNR should review available toxicity data and develop water quality criteria for sulfates. Related Rule(s): NR 105 Surface water quality criteria for toxic substances.</p> |

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| Water Quality Criteria Development | <p>Total Suspended Solids (TSS) or Suspended Sediment</p> | <p>Excess suspended solids in waterbodies can be caused by a number of factors including excess soil erosion, wastewater discharge, snowmelt, and stormwater runoff. In the water column, suspended particles scatter and absorb light rays instead of transmitting them, thus decreasing light penetration. Less light penetration may adversely affect aquatic ecosystems by reducing the number of rooted plants which yields less protective in-water habitat for fish/aquatic life. The WDNR should review the impacts of Total Suspended Solids (TSS) on waterbodies to determine if surface water quality criteria should be calculated for the protection of fish and aquatic life. These criteria may also be beneficial for streamlining Total Maximum Daily Load development and impaired waters listing. WDNR currently assesses sedimentation impairments in streams based on best professional judgment of TSS concentrations. TSS is listed as a pollutant on 262 waterbodies on the State's 303d list (24% of all listings). This accounts for 1,505 impaired stream miles due to TSS (27% of total impaired stream miles). A standard sampling protocol and analytical method already exists for TSS but there is clearly a need to develop a numeric criterion and assessment methodology for one of the most prevalent pollutants in the State. Related Rule(s): NR 102 Water quality standards for surface waters, NR 106 Procedures for calculating water quality based effluent limitations, NR 151 Runoff Management, NR 809 Safe drinking water, NR 140 Groundwater quality.</p> |
| | <p>Unregulated pollutants (eg/flammables, endocrine disruptors)</p> | <p>Develop Water Quality Standards for unregulated pollutants (flammables and endocrine disruptors). Follow the lead of Minnesota DNR in providing funding for sampling in Wisconsin waters to better understand sources and quantity. Related Rule(s): NR 102 Water quality standards for surface waters, NR 105 Surface water quality criteria for toxic substances.</p> |