INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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**Mike Braun**
*Governor*

**Clint Woods**
*Commissioner*

August 18, 2025

Dave Pfeifer, Chief
Watersheds and Wetlands Branch
US Environmental Protection Agency, Region 5
77 West Jackson Boulevard
Chicago, IL 60604-3590

Dear Mr. Pfeifer:

Re: Indiana Water Quality Standards Review Report

The Indiana Department of Environmental Management (IDEM) has completed a review of Indiana's Water Quality Standards in accordance with Section 303(c) of the federal Clean Water Act.

IDEM initiated the review on November 20, 2024, by publicly posting the Notice of Review of Water Quality Standards and Public Hearing in the Indiana Register, by distributing the information by email to stakeholders, and by posting the notice on the Office of Water Quality, Water Quality Standards website. The public comment period was open until close of business on January 5, 2025. A copy of the public notice is found in Appendix A of the attached report.

If you have any questions, please contact me at (317) 232-8402. We will continue to keep USEPA informed as we move forward with the priorities identified in this report.

Sincerely,

Martha Clark Mettler

Martha Clark Mettler
Assistant Commissioner
Office of Water Quality

**REVIEW OF INDIANA WATER QUALITY STANDARDS**
**FINAL REPORT**
**August 18, 2025**

## BACKGROUND

Section 303(c) of the Clean Water Act (CWA) requires states to review their water quality standards (WQS) from time to time, but at least once every three years. During this process, states are to review, and modify as appropriate, their water quality standards after considering public input, United States Environmental Protection Agency (USEPA) guidance, and new scientific and technical information. USEPA rules at 40 CFR §131.20 outline the requirements for this review, specifically related to public participation and engaging stakeholders in the review process, and state reporting requirements.

The goal of the Indiana Department of Environmental Management's (IDEM) 2024 water quality standards review was to engage stakeholders and to identify priorities for rulemaking to update water quality standards to reflect current science and USEPA policies. IDEM's notice of the water quality standards review included a brief description of potential water quality standards priorities for IDEM:

(1) Adopt numeric national recommended water quality criteria (NRWQC) for aluminum (2018). IDEM removed aluminum from its prior metals' rulemaking (LSA Document #14-58), since the proposed aluminum criteria at the time was not consistent with USEPA's 2018 NRWQC for aluminum. In addition, there are some implementation challenges related to adopting the 2018 criterion for aluminum. During the 2021 WQS review, IDEM decided that additional time and research was needed. Some of the challenges include: 1) How to properly assess Indiana waterbodies for bioavailable aluminum and 2) Obtaining enough ambient water quality data on one of the main input parameters for the 2018 aluminum criteria calculator - dissolved organic carbon (DOC). In light of resource and procedural constraints, IDEM believes a rulemaking focused solely on adopting the aluminum criteria is appropriate.

(2) Adopt NRWQC for acrolein (2009), carbaryl (2012), diazinon (2005), nonylphenol (2005), and tributyltin (2004) for waters within and outside of the Great Lakes System. These pollutants are a mix of pesticides, biocides, and anti-fouling agents.

(3) Update Indiana's procedures for calculating human health ambient WQC to reflect current USEPA guidance and to implement consistent statewide procedures. These methodologies are used to derive ambient WQC for chemicals that do not have a NRWQC at Section 304(a) of the CWA but have the potential to impact human health. Updating these procedures will include adopting updated exposure, bioaccumulation, and toxicity factors that reflect the latest scientific information and USEPA policies.

(4) Update or adopt new and updated human health ambient WQC for 94 chemical pollutants that are NRWQC at Section 304(a) of the CWA. USEPA derived the 94 human health ambient WQC using updated exposure, bioaccumulation, and toxicity factors that reflect the latest scientific information and USEPA policies. This could include the adoption of USEPA's 2015

updated exposure assumptions used to calculate human health criteria. IDEM is evaluating USEPA's 2015 updates to their human health methodology, including the exposure assumptions.

(5) Remove the limited use waters classification and waters classified for limited use in 327 IAC 2-1 and 327 IAC 2-1.5.

(6) Update current Indiana WQS variance rules to include a 2015 USEPA rule (40 CFR 131.14) that establishes a regulatory framework for the adoption of WQS variances to implement adaptive management approaches to improve water quality.

**PUBLIC NOTICE:**

IDEM initiated the review by circulating Notice of Review of Water Quality Standards and Public Hearing ("Notice") to a list of stakeholders and OWQ staff, and by posting the Notice in the Indiana Register on Wednesday, November 20, 2024. The public comment period was open from distribution of the Notice until January 5, 2025, a comment period of 45 days. IDEM requested that interested parties transmit comments by mail or common carrier, facsimile, electronic mail, or hand delivery. Appendix A includes a copy of the public notice published in the Indiana Register.

**PUBLIC HEARING**

IDEM utilized the December 11, 2024, Environmental Rules Board meeting to hold a public hearing to communicate the water quality standards review requirements and IDEM's potential priorities to revise and update water quality standards and to solicit feedback from interested parties.

The public notice included information for the public hearing, scheduled for December 11, 2024, at 1:30 pm in person at Conference Room B at the Indiana Government Center South or via the Zoom virtual meeting platform. The public hearing, which was conducted during IDEM's Environmental Rules Board (ERB) meeting, was recorded. During the hearing, IDEM presented an overview of the water quality standards review process, and a list of potential actions to update and/or revise water quality standards for consideration A representative from IMA did provide oral comments during the public hearing. The comments focused solely on IDEM's current efforts to update its aquatic life methodology in rule as well as IDEM's goal of updating its human health methodology in rule. A transcript is available from the December 11, 2024 meeting here: https://www.in.gov/idem/legal/files/rules_erb_transcript_20241211.pdf
After the oral comments concluded, the IDEM Commissioner explained to the Board that no Board action would take place that day. The Commissioner explained that OWQ is required to evaluate its water quality standard priorities at least once every 3 years and must conduct a public hearing to give the public an opportunity to comment on WQS related topics. IMA submitted a formal comment letter following the ERB meeting. Please see stakeholder comment summary below for more information on the comments received.

**Appendix A** includes the Indiana Register notice dated November 20, 2024.

**Appendix B** includes the agenda for the Wednesday, December 11, 2024, Environmental Rule Board meeting.

**Appendix C** includes the PowerPoint presentation for the Environmental Rules Board public hearing. The presentation provided an overview of the water quality standards review process, and IDEM's potential priorities for 2024-2027.

**Appendix D** includes the list of USEPA's nationally recommended 304(a) aquatic life criteria published since 2000 and includes whether IDEM has adopted them. If IDEM has not adopted USEPA's 304(a) criteria for that parameter, the appendix provides an explanation as to why IDEM has not adopted the criterion in question.

**Appendix E** includes the list of USEPA's nationally recommended 304(a) human health criteria published since 2000 and includes whether IDEM has adopted them. If IDEM has not adopted USEPA's 304(a) criteria for that parameter, the appendix provides an explanation as to why IDEM has not adopted the criterion in question.

**Appendix F** includes the two comment letters received electronically during the public notice period: 1) Public Comments of Hoosier Environmental Council dated December 27, 2024; 2) Comments from the Indiana Manufacturers Association, Inc. on the Notice of Review of WQS dated January 3, 2025.

**Appendix G** includes Indiana's FY2025 list of nutrient milestones and updates.

A link to the recording of the Environmental Rules Boards meeting is at:
https://www.youtube.com/watch?v=DDNZ-eUWpsY

## WQS REVIEW COMMENTS

IDEM received two comment letters, one from the Indiana Manufacturers Association (IMA) and one from Hoosier Environmental Council (HEC). Both letters are attached as Appendix F. IDEM is not making any substantial changes to the list of priorities based on these comment letters.

### Stakeholder Comment Summary

HEC comments were generally in support of IDEM's water quality standard review priorities. These comments did encourage IDEM to adopt USEPA's nationally recommended PFAS criteria. IMA comments generally expressed concerns regarding several of IDEM's water quality standard review priorities, particularly IDEM's goal of updating both its aquatic life methodology and human health methodology in order for the whole state to operate under the same methodology for calculating aquatic life and human health numeric criteria. Additional comments and IDEM responses are included below. It should be noted that the comments below represent major comments and concerns identified in each stakeholder letter.

Industry Stakeholder Comment: IDEM does not have to adopt USEPA's 1985 Guidelines, nor does it have to adopt USEPA's nationally recommended criteria. IDEM can continue to use the

current Downstate methodology even though it is a streamlined version of USEPA's 1985 Guidelines.

IDEM Response: While IDEM is not required to adopt USEPA's nationally recommended criteria, §131.20(a) of the federal water quality standards regulation requires states to explain their decision to not adopt new or revised criteria for parameters for which USEPA has published new or updated 304(a) criteria, when reporting the results of their triennial review to USEPA. IDEM is charged with developing water quality standards to be protective of its designated uses, which includes the protection of aquatic life. IDEM also must prevent toxics being discharged in toxic amounts. IDEM believes that the Downstate methodology is outdated, and any update should conform to the 1985 guidelines and include the Great Lakes Tier II methodology for situations where limited toxicity data exists. An updated aquatic life methodology based on the best science available is necessary to consistently and adequately protect aquatic life throughout the entire state and would provide greater consistency in water quality standards in Indiana.

Industry Stakeholder Comment: USEPA should have allowed the public to comment on its human health methodology update and 2015 human health numeric criteria updates.

IDEM Response: USEPA provided opportunities for public comment when it published its 2000 Human Health Methodology as well as when it published its 2015 updated human health criteria and exposure factor assumption recommendations. USEPA developed the 1998 draft Methodology revisions, and the Ambient Water Quality Criteria Derivation Methodology Human Health Technical Support Document. USEPA published these revisions in the Federal Register in August 1998 (WH_FRL-6893-6). A four-month comment followed. In addition, a 15- member independent peer review workshop was held in May of 1999. The 2000 Human Health Methodology (USEPA's current human health methodology) reflects USEPA's guidance after receiving input from the public and peer review experts. USEPA's revisions to the Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health (2000) can be accessed here: Federal Register : Revisions to the Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health (2000). USEPA also published a Federal Register notice (EPA-HW-OW-2014-0135; FRL-9929-85-OW) about updating numerous human health criteria on May 13, 2014, and accepted public comments until August 13, 2014 (60-day comment period). USEPA's Final Updated Ambient Water Quality Criteria for the Protection of Human Health can be accessed with the following link: Updated Ambient Human Health Criteria 2015.

IDEM's Downstate methodologies were based on USEPA's previous 1980 USEPA national human health methodology and have not been updated since 1990. IDEM believes that its Downstate human health methodology needs to be updated to conform with USEPA's updated 2000 human health methodology. As part of this initiative, IDEM will evaluate whether Indiana could develop Indiana-specific default values for calculating human health criteria (such as average body weight and an Indiana based fish consumption rate).

Industry Stakeholder Comment: IDEM should use a probabilistic approach to deriving human health criteria as opposed to the deterministic approach. IDEM should re-consider using

USEPA's default relative source contribution number for human health criteria calculations and generally avoid "compounded conservatism" in human health criteria calculations.

IDEM Response: IDEM appreciates the concern about calculating overly stringent human health calculations. IDEM will evaluate the white paper identified in the industry stakeholder comment letter. IDEM is aware of one state looking into adopting USEPA's 2015 NRWQC that has gone through a probabilistic modeling approach to address risk levels specific to the state's specific conditions. Probabilistic risk assessment techniques are typically much more resource-intensive than the deterministic model most often used by states and USEPA. IDEM would welcome the opportunity to work with stakeholders to incorporate appropriate probabilistic methods but has limitations in technical resources available for such work.

Environmental Stakeholder Comment: IDEM should establish a clear timeline with specific milestones on adopting USEPA's 2018 NRWQC for aluminum. IDEM should prioritize the data collection of Dissolved Organic Carbon (DOC) across various water bodies in Indiana.

IDEM Response: IDEM is unable to provide a detailed timeline on adopting the 2018 aluminum criterion at this time due to implementation challenges identified in the Indiana Register notice. There is still currently no approved method for the bioavailable form of aluminum. IDEM is tracking current efforts going on to publish an ASTM approved bioavailable method for aluminum. IDEM is also planning to study other states who have adopted the 2018 aluminum criterion and how they have handled 303(d) assessments, to inform IDEM's decision making on this topic. IDEM is currently monitoring DOC at a sub-set of IDEM's fixed station monitoring sites. IDEM's goal is to continue rotating DOC sampling sites across the state to get an accurate idea of DOC concentrations and the impact of that range on the resulting aluminum criterion. IDEM will then evaluate whether to include regional DOC values in rule or not.

Environmental Stakeholder Comment: HEC supports IDEM's efforts to update its procedures for calculating human health criteria. IDEM should research appropriate exposure factors and bioaccumulation factors for Indiana and site-specific conditions, particularly at-risk populations. IDEM should convene a diverse stakeholder working group as it works through adopting new and updated human health WQC for about 94 chemical pollutants.

IDEM Response: Before initiating a rulemaking to update Indiana's human health criteria methodology, IDEM will evaluate whether Indiana specific numbers can be utilized (such as average body weight) or whether to default to USEPA's exposure factors and assumptions. Due to competing WQS rulemakings and limited technical resources, IDEM does not currently intend to convene an external advisory work group for adopting new and updated human health criteria but will evaluate establishing a work group when work begins on this rule update. IDEM believes the rigorous rulemaking and notice-and-comment process for individual rules provides ample opportunities for input on what the agency is proposing.

Environmental Stakeholder Comment: IDEM should adopt USEPA's NRWQC for PFOA and PFOS and urges IDEM to focus efforts on addressing PFAS in Indiana's water bodies. IDEM should take action on emerging PFAS compounds in general and expand its focus beyond PFOA and PFOS.

IDEM Response: IDEM is currently evaluating USEPA's NRWQC for PFAS compounds and notes that federal PFAS regulation and guidance are currently in flux. The NRWQC for aquatic life are several orders of magnitude above typical ambient concentrations of PFAS compounds in surface water bodies. Thus far, scientific research is showing that PFAS is more harmful to humans than to aquatic organisms. IDEM is still reviewing USEPA's draft human health criteria for PFOA, PFOS, and PFBS. The draft human health criteria are extremely low and are less than the finalized MCL of 4 mg/l for PFOA and PFOS. IDEM does have concerns about the exposure pathways for PFAS accounted for in the development of the draft human health criteria. In addition, there is currently no approved method that can quantify down to these low concentrations. Implementing the human health criteria would present significant challenges. IDEM needs additional time to evaluate the human health criteria once USEPA finalizes its recommendations. IDEM is also tracking USEPA's work on developing effluent limitation guidelines (ELGs) for PFAS in certain industries.

## IDEM PRIORITIES FOR 2024 - 2027

*Rulemaking Priorities Discussion*

IDEM prioritized staff needs and evaluated current resources to initiate different WQS rulemakings. IDEM's top priority is to finish updating the methodology used to derive aquatic life criteria for substances that are not in rule for waters outside of the Great Lakes System ("Downstate"). IDEM is actively working on this rulemaking. The Downstate aquatic life methodology has not been updated since the 1990 rulemaking. The aquatic life methodology in the Downstate rule predates USEPA's current methodology, *Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses (1985)*. Because IDEM's rules for waters within and outside of the Great Lakes System have different methodologies, derived criteria may not be equivalent and consistent across the state, creating unnecessary burdens and risk communication challenges. Updating the Downstate methodology to derive aquatic life criteria for substances not in rule to be consistent with the Great Lakes System methodology, where appropriate, will result in more predictable, consistently derived criteria across the state for substances of concern.

Given the length of time required for a single IDEM rulemaking, consideration was given to combining priorities, where it is logical to do so, into a single rulemaking, and then proceeding with more than one priority at a time. One thought was to combine aquatic life criteria revisions and updates into one proposed rulemaking, and the human health criteria revisions and updates into a second proposed rulemaking.

On June 19, 2024, a potential list of priorities was sent to IDEM staff who participate in the Office of Water Quality's monthly water quality standards cross-program coordination meetings. These potential priorities were discussed at the June 2024 coordination meeting.

- Adopt USEPA's 2018 aluminum criteria.
- Adopt USEPA's 2013 ammonia criteria.
- Eliminate a sub-set of limited use waterbodies listed in rule.

- Update human health methodology to reflect latest science & USEPA's 2000 methodology.
- Update human health criteria for approximately 94 different pollutants. Update outdated naming conventions in Downstate part of WQS rules for non-conventional pollutants
- Research Fluoride to evaluate whether new aquatic life criteria for fluoride should be adopted.
- Decide whether Indiana's current Arsenic criteria need to be updated to reflect latest science and USEPA's focus on total inorganic arsenic.
- Evaluate neonicotinoid data and evaluate whether aquatic life criteria are needed. Track USEPA's pesticide thresholds and criteria as they come out.
- Consider adopting human health surface water criteria for PFAS compounds.
- Adopt aquatic life criteria for following pesticides and surfactants: acrolein, carbaryl, diazinon, nonylphenol and tributyltin

During the public comment period, in addition to two stakeholder comment letters received, there were also several noteworthy federal actions. USEPA released their draft comparison of aquatic life protective values for pesticides on December 23, 2024. USEPA analyzed the differences in approach between aquatic life benchmarks developed for pesticide registration under Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and how aquatic life criteria are developed under the Clean Water Act (CWA). Since minimal differences were found between the two methods, USEPA is considering publishing the FIFRA pesticide aquatic life benchmarks as their nationally recommended 304(a)(1) criteria for pesticides. Indiana is interested in digesting this report and potential publications from USEPA based on this report since a few of the pesticides under review with this analysis are Acrolein, Carbaryl, and Diazinon. Updating IDEM's aquatic life criteria for these pesticides are included as one of IDEM's WQS rulemaking priorities.

In addition, USEPA published its draft 304(a)(1) human health criteria in ambient waters for PFAS compounds on December 19, 2024. IDEM will monitor the finalization of either the draft human health criteria for PFAS compounds as well as any final report or 304(a)(1) recommendations coming from the comparison work of aquatic life protective values for pesticides against CWA aquatic life criteria.

After the public notice period ended on January 5, 2025, IDEM staff evaluated both the public comments received as well as USEPA's recent draft criteria and pesticide analysis work noted above during final discussions surrounding IDEM's 2024-2027 rulemaking priorities. IDEM notes the following regarding IDEM's WQS priorities:

- Staff agreed that adopting USEPA's 2018 aluminum is still a priority after completing the aquatic life methodology rulemaking. IDEM is hoping to review a finalized Aluminum Technical Support Document from USEPA before deciding on IDEM's implementation approach for adopting the 2018 NRWQC for aluminum.

- IDEM is considering initiating a "Notice of Comment Period for Potential Rulemaking" for the aluminum criteria adoption process, to solicit comments early on from interested stakeholders. This is in accordance with Indiana's rulemaking process

changes from HEA 1623 rulemaking bill. IDEM is anticipating the aluminum rulemaking to garner a lot of interest from industry stakeholders.

- IDEM staff agreed that it has enough DOC data across the state to begin analyzing the data for regional or statewide trends. IDEM will use available DOC data to develop total organic carbon to dissolved organic carbon ratios. Additionally, IDEM must choose one of two methods established in the NRWQC to use when deriving acute and chronic criterion values: (1) Calculate the criteria values for each waterbody or waterbody segment that has aquatic life as a designated use by entering the pH, total hardness and DOC values into the USEPA's Aluminum Criteria Calculator V2.0; 4 or, (2) Use the lookup tables provided in the criteria document to find the values associated with the specific conditions of pH, total hardness and DOC.

- Staff agreed with the concept of proceeding with more than one rulemaking at a time, staggered, on separate tracks. Such an approach will maximize opportunities for public participation and build greater WQS rulemaking capacity for IDEM and ERB.

- IDEM believes updating the aquatic life methodology rules for waters outside of the Great Lakes System ("Downstate") is a priority. Updating the methodology is taking longer than anticipated thus it needs to re-initiate this rulemaking under new rulemaking procedures that became effective in 2023. This rulemaking should be conducted separately from other rules in order to more efficiently proceed and enable focused public participation.

*Indiana's non-101(a)(2) Uses: Limited Use & Wet Weather Limited Use Sub-Category*

All waters of the state, besides a few exceptions, are designated to support full body recreation and to support a warm well-balanced aquatic life community. However, Indiana does have several receiving stream segments that are non-101(a)(2) uses that fit into two different categories: 1) Limited Use; 2) Wet Weather Limited Use.

As mentioned above, IDEM would like to remove the limited use category. IDEM believes this provision is outdated and unnecessary. All municipal wastewater plants that discharge to limited use streams can provide reliable secondary treatment and therefore meet Indiana's ammonia and dissolved oxygen water quality standards. Removing the limited use stream designation will remain on IDEM's list of WQS related rulemaking priorities.

In addition, IDEM has a wet weather limited use subcategory which allows for a suspension of Indiana's recreational use standard for a period of four (4) days after an approved CSO discharge for communities who have completed the use attainability analysis (UAA) process. The City of Indianapolis' and the City of Fort Wayne's UAAs were approved by USEPA on July 29, 2020, and on October 18, 2023, respectively. IDEM believes that these segments are appropriately listed under the wet weather use subcategory.

*IDEM's Site-specific Criteria*

IDEM has site-specific criteria for copper, cyanide, lead, and cadmium for certain waters not within the Great Lakes system. IDEM also has site-specific criteria for free cyanide for the East Branch Grand Calumet River in the Great Lakes system for adult salmonids present and salmonids absent conditions.

**Table 1. Site-Specific Criteria for Waters Not within the Great Lakes System**

| **Waterbody** | **Permittee & Starting Location** | **Ending Location** | **Substances** |
|---|---|---|---|
| Richland Creek | City of Princeton POTW; IN0024392; Outfall 001 | Confluence of Richland Creek with McCarty Ditch | Copper (dissolved), Cyanide (Free), Lead (Dissolved) |
| Wabash River | Paperworks Industries, Inc.; IN0054810; Outfall 001; RM387 | A point two (2) miles downstream | Cyanide (Free) |
| Wabash River | Evonik Corporation; IN0002861; Outfall 001; RM309 | A point two (2) miles downstream | Copper (Dissolved) |
| Wabash River | Elanco US, Inc.; IN0002852; Outfall 001; RM236 | A point two (2) miles downstream | Lead (Dissolved) |
| West Fork White River | CWA Authority, Inc.; IN0023183; Belmont POTW; Outfall 006; RM227 | The Marion-Johson County line (River mile 220) | Cadmium (Dissolved), Copper (dissolved), Cyanide (Free), Lead (Dissolved) |

**Table 2. Site-Specific Criteria for Waters within the Great Lakes System**

| Waterbody | NPDES Permit | Ending Location | Substance |
|---|---|---|---|
| East Branch Grand Calumet River | U.S. Steel IN0000281 Outfall 005 (former outfall) | A point one (1) mile downstream | Cyanide (Free)-salmonids present and salmonids absent criteria |

The only criterion that has changed since these site-specific criteria were approved on October 3, 2005, is the cadmium aquatic life criterion. Since these site-specific criteria have not been re-assessed for 10 years, IDEM believes it is important to re-evaluate these site-specific criteria, particularly the cadmium criterion, to ensure they are still valid and scientifically sound site-specific criteria.

### *IDEM WQS Rulemaking Priorities for 2025-2028*

Appendices D and E list USEPA NRWQC for aquatic life and human health published since2000, and IDEM's plans for addressing these recommendations.

IDEM's final 2024-2027 priorities listed below are in hierarchical order:

1. Propose a rulemaking under the new rulemaking process (effective 2023) to update Indiana's procedures for calculating aquatic life ambient WQC for substances without criteria in rule for waters outside of the Great Lakes system to reflect current USEPA guidance and to implement more consistent statewide procedures. IDEM is considering also including some general rulemaking updates as part of this rulemaking. Some of the other updates include removing outdated rule language, fixing errors from IDEM's previous metals rulemaking, updating NPDES application references, clarifying the hierarchy aspects of IDEM's selenium fish tissue-based criterion.
2. Propose a rulemaking to adopt numeric national recommended water quality criteria (NRWQC) for aluminum (2018) and develop an implementation strategy for assessment and permitting.
3. Re-evaluate list of site-specific criteria for the Downstate region and for waters within the Great Lakes system.
4. Propose a rulemaking to update Indiana's procedures for calculating human health ambient WQC to reflect current US EPA guidance and to implement consistent statewide procedures. These methodologies are used to derive ambient WQC for chemicals that do not have a NRWQC at Section 304(a) of the CWA but have the potential to impact human health. Updating these procedures will include adopting updated exposure, bioaccumulation, and toxicity factors that reflect the latest scientific information and US EPA policies. As part of this action item, IDEM plans to examine the probabilistic risk approach versus deterministic approach when it comes to calculating human health criteria.

5. Adopt new and updated human health ambient WQC for 94 chemical pollutants that are NRWQC at Section 304(a) of the CWA. USEPA derived the 94 human health ambient WQC using updated exposure, bioaccumulation, and toxicity factors that reflect the latest scientific information and USEPA policies. This could include the adoption of USEPA's 2015 updated exposure assumptions used to calculate human health criteria. IDEM is evaluating USEPA's 2015 updates to their human health methodology, including the exposure assumptions.
6. Propose a rulemaking to remove the limited use waters classification and waters classified for limited use in 327 IAC 2-1 and 327 IAC 2-1.5. As part of this rulemaking initiative, IDEM would like to re-visit the list of wastewater plants discharging to limited use streams and determine if any remaining facilities would be unlikely to meet water quality standards based on maintaining a warm well-balanced aquatic life community.
7. Propose a rulemaking to adopt NRWQC aquatic life criteria for substances not included in our current rules including: acrolein (2009), carbaryl (2012), diazinon (2005), nonylphenol (2005), and tributyltin (2004). If USEPA chooses to publish some of FIFRA's pesticide aquatic values as 304(a) NRWQC, IDEM will consider whether to adopt those pesticide aquatic life criteria.

IDEM will follow state requirements to propose regulatory revisions to address the changes identified above. Other changes may be included in the proposed WQS for regulatory change if sufficient information is available to support a change.

Appendix A

2024 Water Quality Standards Review

Notice of Review of Water Quality Standards and Public Hearing

## DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

### Notice of Review of Water Quality Standards and Public Hearing

The Indiana Department of Environmental Management (IDEM) is soliciting public comment on Indiana's Water Quality Standards (WQS) and potential future rulemakings to amend Indiana's WQS. The federal Clean Water Act (CWA) requires all states to develop, review, revise, and adopt WQS. WQS must include the designated uses of the waterbody, water quality criteria necessary to protect those uses, and antidegradation provisions to protect the water quality. Section 303(c) of the CWA and federal regulations at 40 CFR Part 131.20 require states to hold a public hearing to review their water quality standards at least once every three years. IDEM conducted its last WQS Review in 2021. IDEM's 2021 WQS Review report to U.S. EPA included the public comment received and IDEM's response. This report may be viewed on IDEM's Water Quality Standards web page: wqs_2021_review_report.pdf.

The most recent rulemaking to revise Indiana's WQS was a rulemaking to update Indiana's aquatic life and human health ambient water quality criteria (WQC) for metals, LSA Document #14-58, which was approved by EPA in February 2022. A rulemaking to update Indiana methodologies for calculating aquatic life WQC to reflect current United States Environmental Protection Agency (U.S. EPA) guidance and to implement consistent statewide procedures is currently in process (LSA Document #21-539).

An overall priority for IDEM is to make the standards consistent for all waters, which includes both the waters within the Great Lakes System and those outside of the Great Lakes System, commonly referred to as "downstate". Currently, IDEM has the following proposals and plans under consideration:

(1) Adopt numeric national recommended water quality criteria (NRWQC) for aluminum (2018). IDEM removed aluminum from the metals' rulemaking mentioned above (LSA Document #14-58), since the proposed aluminum criteria at the time was not consistent with EPA's 2018 NRWQC for aluminum. In addition, there are some implementation challenges related to adopting the 2018 criterion for aluminum. During the 2021 WQS review, IDEM decided that additional time and research was needed. Some of the challenges include: 1) How to properly assess Indiana waterbodies for bioavailable aluminum and 2) Obtaining enough ambient water quality data on one of the main input parameters for the 2018 aluminum criteria calculator - dissolved organic carbon (DOC). IDEM believes a separate rulemaking that focuses solely on adopting the aluminum criteria is appropriate.

(2) Adopt NRWQC for acrolein (2009), carbaryl (2012), diazinon (2005), nonylphenol (2005), and tributyltin (2004) for waters within and outside of the Great Lakes System. These pollutants are a mix of pesticides, biocides, and anti-fouling agents.

(3) Update Indiana's procedures for calculating human health ambient WQC to reflect current U.S. EPA guidance and to implement consistent statewide procedures. These methodologies are used to derive ambient WQC for chemicals that do not have a NRWQC at Section 304(a) of the CWA but have the potential to impact human health. Updating these procedures will include adopting updated exposure, bioaccumulation, and toxicity factors that reflect the latest scientific information and U.S. EPA policies.

(4) Update or adopt new and updated human health ambient WQC for 94 chemical pollutants that are NRWQC at Section 304(a) of the CWA. U.S. EPA derived the 94 human health ambient WQC using updated exposure, bioaccumulation, and toxicity factors that reflect the latest scientific information and U.S. EPA policies. This could include the adoption of U.S. EPA's 2015 updated exposure assumptions used to calculate human health criteria. IDEM is evaluating EPA's 2015 updates to their human health methodology, including the exposure assumptions.

(5) Remove the limited use waters classification and waters classified for limited use in 327 IAC 2-1 and 327 IAC 2-1.5.

(6) Update current Indiana WQS variance rules to include a 2015 U.S. EPA rule (40 CFR 131.14) that establishes a regulatory framework for the adoption of WQS variances to implement adaptive management approaches to improve water quality.

U.S. EPA published NRWQC at Section 304(a) of the CWA for perfluorooctanoic acid (PFOA) and for perfluorooctane sulfonate (PFOS) for the protection of aquatic life (September 2024). U.S. EPA has not published other NRWQC for the protection of aquatic life or human health since IDEM's 2021 WQS Review. IDEM is anticipating EPA to publish draft human health NRWQC for several PFAS compounds in the near future. IDEM will evaluate EPA's PFAS related criteria recommendations as they are finalized.

On August 18, 2023, the U.S. District Court for the District of Arizona issued an order vacating EPA's 2016 national recommended chronic freshwater cadmium aquatic life criterion. IDEM had recently adopted EPA's 2016 cadmium aquatic life criteria in the recent metals' rulemaking, which was approved by EPA February 2022, for

both the Great Lakes and Downstate regions of the state. EPA is continuing to evaluate the U.S. District Court Order. As a result of that Order, EPA's 2001 chronic cadmium criterion is in effect. IDEM does not currently plan to revise its criteria for cadmium. IDEM believes the 2016 cadmium criteria are based on the best available science and on additional aquatic toxicity studies that were not available at the time of EPA's 2001 cadmium criteria update. IDEM will evaluate any future EPA revisions to their cadmium criteria for the protection of aquatic life.

IDEM believes these proposed rulemaking priorities focus on key updates needed to improve Indiana's WQS but is interested in hearing public opinion on all aspects of the WQS. With this notice, IDEM requests feedback from all interested parties on any aspect of Indiana's WQS contained in Title 327 of the Indiana Administrative Code (IAC), Article 2. Public comments should include:

(1) the matter at issue;

(2) whether the issue is currently covered by the WQS, and, if so, where any suggested change should be made to the WQS;

(3) the basis for the suggested change; and

(4) technical information, reports, or references that support the comment.

The estimated fiscal impact of changes to the WQS is impossible to determine at this notice stage without knowing what changes may ultimately occur.

The Environmental Rules Board (ERB) will hold a public hearing concerning the 2024 Review of WQS at its meeting held on December 11, 2024, starting at 1:30 p.m. in the Indiana Government Center-South, Conference Room A, 10 N. Senate Ave, Indianapolis, IN 46204.

The public may join the ERB meeting in person or join by using the Teams link, meeting ID, and passcode, or telephone numbers that can be found prior to the meeting at: https://events.in.gov/idem.

Following a brief presentation by IDEM, a public hearing will be held on Indiana's WQS. The purpose of this hearing is to solicit public comments on Indiana's WQS. All interested persons are invited and will be given reasonable opportunity to express their views concerning Indiana's WQS. Oral statements will be heard, but, for the accuracy of the record, all comments should be submitted in writing. No votes or actions will be taken by the ERB. At this time, additional public meetings to solicit public comments are not scheduled.

Individuals requiring reasonable accommodations for participation in this public hearing should contact the IDEM, Americans with Disabilities Act coordinator at:

Attn: ADA Coordinator
Indiana Department of Environmental Management
Indiana Government Center North
100 North Senate Avenue
Indianapolis, IN 46204-2251

or call (317) 233-1785 (V). Speech and hearing impaired callers may contact IDEM via the Indiana Relay Service (711) or (800) 743-3333. Please provide a minimum of 72 hours notification.

Written comments in response to this notice must be postmarked or time stamped not later than January 5, 2025, and submitted in one of the following ways:

(1) By mail or common carrier to the following address:

Notice of Review of WQS
Gabby Ghreichi
Surface Water Quality Standards Coordinator
Office of Water Quality
Indiana Department of Environmental Management

(2) By email to gghreich@idem.in.gov. To confirm timely delivery of your comments, please request a document receipt when you send the email.

Regardless of the delivery method used; in order to properly identify each comment, it must clearly specify the title of "Notice of Review of WQS".

Additional information regarding this action may be obtained from Gabby Ghreichi, Technical Environmental Specialist, Office of Water Quality, (317) 234-1191 or at gghreich@idem.in.gov or Martha Clark Mettler, Assistant Commissioner IDEM, Office of Water Quality (317)-232-8402 or at mclark@idem.in.gov.

*Posted: 11/20/2024 by Legislative Services Agency*
An html version of this document.

Appendix B

Water Quality Standards Review Public Hearing Agenda

December 11, 2024

**AGENDA**
**INDIANA ENVIRONMENTAL RULES BOARD**
Indiana Government Center - South
Conference Room A
Public Entrance at 10 North Senate Avenue
*Teams Information
Indianapolis, Indiana

**Wednesday**
**December 11, 2024**
**1:30 p.m.**

**A. Call to Order**
Quorum

**B. Approval of Meeting Summary of October 9, 2024**

**C. IDEM Reports**
Commissioner's Report
Rules Update

**D. Rules**

1. **Title 329 Kaiser Aluminum.** Final adoption of 329 IAC 3.1-6-8. LSA #24-213.
   *(a) Public Hearing concerning draft rule.*
   *(b) Board Consideration of final adoption of draft rule.*

2. **Title 326 Emergency Affirmative Defense.** Final adoption of 326 IAC 1-6, 326 IAC 2-7, and 326 IAC 2-8. LSA #24-318.
   *(a) Public Hearing concerning draft rule.*
   *(b) Board Consideration of final adoption of draft rule.*

3. **Title 329 Waste Tire Financial Assurance Updates.** Preliminary adoption of Title 329. LSA #24-322.
   *(a) Public Hearing concerning draft rule.*
   *(b) Board Consideration of preliminary adoption of draft rule.*

4. **Title 329 Coal Combustion Residuals.** Preliminary adoption of 329 IAC 10. LSA #21-458.
   *(a) Public Hearing concerning draft rule.*
   *(b) Board Consideration of preliminary adoption of draft rule.*

**E. Non-Rule Actions**

1. 2024 Water Quality Standards Review

2. Air Permitting Report

**F. Other Matters**

1. Open Forum

2. Tentative Date and Location of Next Meeting**
   March 12, 2025

3. Board packet information can also be retrieved online as early as one week prior to the meeting at: https://www.in.gov/idem/legal/rulemaking/environmental-rules-board-packets/

**G. Adjournment**

*Join Teams Meeting

The public may attend the ERB meeting in person or join by using the Teams link, meeting ID, and passcode, or telephone numbers that can be found prior to the meeting at: https://events.in.gov/idem.

** Dates and Locations of Board Meetings are subject to change. For confirmation, please check with the Rule Development Section, Office of Legal Counsel at (317) 232-8922 or (800) 451-6027, ext. 2-8922, or kkindric@idem.in.gov.

**********

*Individuals requiring reasonable accommodations for participation in this event should contact the Indiana Department of Environmental Management, Americans with Disabilities Act coordinator at:*

*Attn: ADA Coordinator*
*Indiana Department of Environmental Management*
*100 N. Senate Avenue*
*Indianapolis, IN 46204*

*or call (317) 233-1785(V). Speech and hearing impaired callers may contact the agency via the Indiana Relay Service (711) or 1-800-743-3333. Please provide a minimum of 72 hours notification.*

**********

Appendix C

2024 Water Quality Standards Review

Environmental Rules Board Hearing Presentation

December 11, 2024

# 2024 Review of Indiana's Water Quality Standards

Environmental Rules Board Meeting
Dec. 11, 2024

Gabby Ghreichi
*Surface Water Quality Standards Coordinator*

# What is a Water Quality Standards Review?

- Clean Water Act requirement for states, once every three years.
- An opportunity for the public to comment on the need for revisions, additions, or other changes to Indiana's water quality standards.
- Public comment period continues through Jan. 5, 2025.

# Core Components of Water Quality Standards

- Designated uses for Indiana surface water.
  - Aquatic life, recreation, drinking water, agricultural, industrial.
- Criteria to protect designated uses.
  - Narrative and numeric.
- Antidegradation requirements
  - Maintain the level of water quality to protect designated uses.
  - Prevent significant lowering of water quality unless there is a social and economic need.

# Indiana Surface Water Quality Standards

- Two sets of rules:
  - Waters outside of the Great Lakes System ("Downstate").
  - Waters within the Great Lakes System.

- Differences between rules:
  - Criteria;
  - Methodology to derive criteria for substances that are not in rule; and
  - Specific requirements for Great Lakes states and provinces.

**One of IDEM's overarching goals is to have consistent WQS rules for the whole state, when it makes sense to do so.**

# Indiana Surface Water Quality Standards

- WQS are the foundation for other regulatory actions such as permitting, compliance, enforcement, as well as monitoring and assessing the quality of Indiana's surface waters.

# Aquatic Life Methodology Rulemaking
# LSA 21-539

- Rulemaking currently underway to update Downstate procedures for calculating aquatic life criteria for substances for which U.S. EPA has not published NRWQC.
    - Update the aquatic life methodology to reflect current U.S. EPA guidance.
    - IDEM uses these methodologies to derive ambient WQC when there are not criteria in rule for substances that could adversely impact aquatic life.

# IDEM Priorities for 2024 WQS Review

- **Adopt EPA's 2018 Aluminum Criteria**
  - Criteria are a function of pH, hardness, and dissolved organic carbon (DOC).
  - IDEM is working on developing implementation components related to adopting the 2018 Aluminum Criteria.
    - IDEM has collected more DOC data across the state and is evaluating this data to understand how the 2018 aluminum criterion changes with varying DOC values.
    - IDEM is working on how to accurately assess waterbodies for aluminum, based on the 2018 Aluminum Criteria. There is a need for an updated analytical method for dissolved aluminum in surface water.

# IDEM Priorities for 2021 WQS Review

- Adopt NRWQC aquatic life criteria for substances not included in our current rules including: acrolein (2009), carbaryl (2012), diazinon (2005), nonylphenol (2005), and tributyltin (2004).
    - For waters within and outside of the Great Lakes System.

- These substances are a mix of pesticides, biocides, and anti-fouling agents

# IDEM Priorities for 2024 WQS Review

- Update Indiana's procedures for calculating human health criteria to reflect current U.S. EPA guidance and to implement consistent statewide procedures.
  - Used to derive criteria for chemicals that do not have a U.S. EPA NRWQC but have the potential to impact human health.
  - Includes updated exposure, bioaccumulation, and toxicity factors that reflect the latest scientific information and U.S. EPA policies.
    - Exposure factor examples include average body weight, daily drinking water intake, etc.

# IDEM Priorities for 2024 WQS Review

- Adopt new and updated human health NRWC published in 2015 for 94 chemical pollutants.
  - Derived using updated exposure, bioaccumulation, and toxicity factors that reflect the latest scientific information and U.S. EPA policies.
  - During the 2021 WQS review, IDEM received one comment inquiring whether IDEM planned to adopt the 2015 U.S. EPA updated exposure assumptions used to calculate human health criteria, and the new and updated 94 human health criteria derived using these updated exposure assumptions.
  - This rulemaking would update many Downstate human health criteria.

# IDEM Priorities for 2024 WQS Review

- Remove the limited use waters classification and waters classified for limited use in 327 IAC 2-1 and 327 IAC 2-1.5.

# IDEM Priorities for 2024 Review

- Update current Indiana WQS variance rules to include a 2015 U.S. EPA rule (40 CFR 131.14) that establishes a regulatory framework for the adoption of WQS variances to implement adaptive management approaches to improve water quality.

# Questions?

***Public Comment Period for 2024 WQS Review Closes***

***Jan. 5, 2025***

Gabby Ghreichi
Water Quality Standards Program
IDEM – Office of Water Quality

gghreich@idem.IN.gov
317-234-1191

IDEM Water Quality Standards Webpage
idem.IN.gov/cleanwater/resources/water-quality-standards

# Appendix D

## IDEM Adoption of New or Updated CWA Section 304(a) Criteria Recommendations for Aquatic Life Published Since May 30, 2000

## Appendix D

IDEM Adoption of New or Updated CWA Section 304(a) Criteria Recommendations for Aquatic Life Published Since May 30, 2000

| Pollutant | CAS# | NRWQC for AL Publication Year | IDEM Down State – Duly Adopted? (Date) | IDEM Great Lakes System - Duly Adopted? (Date) | IDEM explanation for not adopting NRWQC for AL at 304(a) of CWA (NRWQC) |
|---|---|---|---|---|---|
| Acrolein | 107028 | 2009 | No | No | a |
| Aluminum | 7429905 | 2018 | No | No | One of IDEM's top priorities is to adopt EPA's 2018 aluminum criteria. IDEM still has concerns on how to properly assess Indiana's waterbodies for the bioavailable form of aluminum for the 303(d) list. IDEM is working on studying how other states like Oregon are assessing aluminum under EPA updated 2018 criteria. IDEM is currently evaluating dissolved organic carbon (DOC) data collected thus far to help make a decision on whether to adopt a regional DOC number into WQS rules. |
| Ammonia | 7664417 | 2013 | No | No | IDEM had a past workgroup that started to study how IDEM would implement the ammonia NRWQC across a wide range of wastewater treatment systems, and how to mitigate the economic impact of adopting this criterion for communities and entities with limited resources. IDEM has concerns on how small dischargers including controlled dischargers/lagoon facilities would be able to meet the more stringent ammonia criteria. IDEM plans to study how Ohio and other states implement the 2013 ammonia criteria, specifically with a multi-discharger variance (MDV). IDEM is interested to explore in more detail whether an MDV for ammonia would be viable for IDEM's WQS and permitting program. |
| Carbaryl | 63252 | 2012 | No | No | a |
| Cadmium | 7440439 | 2016* | Yes | Yes | IDEM believes the 2016 cadmium criteria are based on the best available science and on additional aquatic toxicity studies that were not available at the time of |

| Pollutant | CAS# | NRWQC for AL Publication Year | IDEM Down State – Duly Adopted? (Date) | IDEM Great Lakes System - Duly Adopted? (Date) | IDEM explanation for not adopting NRWQC for AL at 304(a) of CWA (NRWQC) |
|---|---|---|---|---|---|
| | | *On August 18, 2023, the U.S. District Court for the District of Arizona issued an order vacating EPA's 2016 national recommended chronic freshwater cadmium aquatic life criterion. As a result of that Order, EPA's 2001 chronic cadmium criterion is in effect. IDEM does not currently plan to revise its criteria for cadmium. | | | EPA's 2001 cadmium criteria update. IDEM will evaluate any future EPA revisions to their cadmium criteria for the protection of aquatic life. |
| Copper | 7440508 | 2007 | No | No | IDEM understands that the 2018 USEPA-Metals Associations Cooperative Research and Development Agreement plans to reevaluate the Copper Biotic Ligand Model. They are considering recommending a Multiple Linear Regression (MLR) approach using fewer input parameters for the copper NRWQC, modeled after the current proposed NRWQC for aluminum which has three input parameters (pH, DOC, hardness). IDEM intends to adopt EPA's 2018 aluminum criteria in a future rulemaking and get experience utilizing this type of MLR based criterion. IDEM has considered adopting the copper BLM but has concerns for implementation of a criterion with this set of ten input parameters. IDEM will consider adopting the updated MLR approach in lieu of the current BLM copper criterion, after EPA publishes it. |

| Pollutant | CAS# | NRWQC for AL Publication Year | IDEM Down State – Duly Adopted? (Date) | IDEM Great Lakes System - Duly Adopted? (Date) | IDEM explanation for not adopting NRWQC for AL at 304(a) of CWA (NRWQC) |
|---|---|---|---|---|---|
| Diazinon | 333415 | 2005 | No | No | a |
| Nonylphenol | 84852153 | 2005 | No | No | a |
| Nutrients | NA | 2003 | No | No | IDEM continues to research how to draft eutrophication criteria to protect aquatic life and human health (in terms of aesthetics and recreational activities). See IDEM's "Nutrient Criteria Development Milestones for FY24" submitted to EPA Region 5 August 1, 2024. IDEM has also completed a nutrients N-STEPS project with EPA/Tetra Tech. This project entailed evaluating the majority of IDEM's nutrient chemistry and biological data so far to determine if any meaningful relationships can be ascertained about the impact of elevated nutrients on aquatic life. The final report was just sent to IDEM during the spring of 2025. IDEM is continuing to evaluate the results of this report and determine next steps. IDEM is considering revising its assessment methodology for nutrients. |
| Perfluorooctanoic acid (PFOA) | 335-67-1 | 2024 | No | No | IDEM is still evaluating the draft human health criteria for PFOA, since the aquatic life criterion is several orders of magnitude below the surface water huma health criterion. Adopting the aquatic life criteria for PFAS compounds is currently not a high priority for IDEM since the analogous draft human health criteria are several orders of magnitude lower than the surface water aquatic life criteria. |
| Perfluorooctane sulfonate (PFOS) | 1763-23-1 | 2024 | No | No | IDEM is still evaluating the draft human health criteria for PFOS, since the aquatic life criterion is several orders of magnitude below the surface water huma health criterion. Adopting the aquatic life criteria for PFAS compounds is currently not a high priority for IDEM since the analogous draft human health criteria are several orders of magnitude lower than the surface water aquatic life criteria. |

| Pollutant | CAS# | NRWQC for AL Publication Year | IDEM Down State – Duly Adopted? (Date) | IDEM Great Lakes System - Duly Adopted? (Date) | IDEM explanation for not adopting NRWQC for AL at 304(a) of CWA (NRWQC) |
|---|---|---|---|---|---|
| Selenium | 7782492 | 2016 | Yes | Yes | IDEM adopted the selenium criterion in the Downstate and Great Lakes region. EPA approved of the adopted selenium standard February 1, 2022. IDEM has developed a fish sampling guidance document to assist with the implementation of the selenium fish-tissue based criterion, dating November 2024. The fish sampling guidance document is available on IDEM's WQS website: https://www.in.gov/idem/cleanwater/resources/water-quality-standards/ |
| Tributyltin | NA | 2004 | No | No | a |

NRWQC for AL: National Recommended Water Quality Criteria for Aquatic Life at Section 304(a) of the Clean Water Act

a. IDEM has not designated adopting this criterion as a high priority for Indiana. Stakeholders have not identified adopting this criterion as a priority for Indiana. IDEM is considering a future rulemaking to adopt the NRWQC for acrolein, carbaryl, diazinon, nonylphenol and tributyltin following our planned rulemaking to update the aquatic life criteria methodology for waters outside of the Great Lakes System.

# Appendix E

## IDEM Adoption of New or Updated CWA Section 304(a) Criteria Recommendations for Human Health Published Since May 30, 2000

**Appendix E**

**Indiana 2024 Water Quality Standards Review**

IDEM Adoption of New or Updated CWA Section 304(a) Criteria Recommendations for Human Health Published Since May 30, 2000

| Pollutant | CAS# | NRWQC for HH Publication Year | IDEM Down State – Duly Adopted? (Date) | IDEM Great Lakes System - Duly Adopted? (Date) | IDEM explanation for not adopting NRWQC for HH at 304(a) of CWA (NRWQC) |
|---|---|---|---|---|---|
| Acenapthene | 83329 | 2015 | No | No | a |
| Acrolein | 107028 | 2015 | No | No | a |
| Acrylonitrile | 107131 | 2015 | No | No | a |
| Aldrin | 309002 | 2015 | No | No | a |
| alpha-Hexachlorocyclohexane (HCH) | 319846 | 2015 | No | No | a |
| alpha-Endosulfan | 959988 | 2015 | No | No | a |
| Anthracene | 120127 | 2015 | No | No | a |
| Antimony | 7440360 | 1980 but revised in 2002 to reflect EPA's IRIS reference dose. | Yes | No | IDEM completed a metals rulemaking that included updating human health criteria for Antimony outside of the Great Lakes system. EPA approved the metals rulemaking package on February 1, 2022. |
| Benzene | 71432 | 2015 | No | No | a |
| Benzidine | 92875 | 2015 | No | No | a |
| Benzo(a)anthracene | 56553 | 2015 | No | No | a |
| Benzo(a)pyrene | 50328 | 2015 | No | No | a |
| Benzo(b)fluoranthene | 205992 | 2015 | No | No | a |
| Benzo(k)fluoranthene | 207089 | 2015 | No | No | a |
| beta-Hexachlorocyclohexane (HCH) | 319857 | 2015 | No | No | a |
| beta-Endosulfan | 33213659 | 2015 | No | No | a |
| Bis(2-Chloro-1-methylethyl) Ether | 108601 | 2015 | No | No | a |
| Bis(2-Chloroethyl) Ether | 111444 | 2015 | No | No | a |
| Bis(2-Ethylhexyl) Pthalate | 117817 | 2015 | No | No | a |
| Bis(Chloromethyl)ether | 542881 | 2015 | No | No | a |
| Bromoform | 75252 | 2015 | No | No | a |

| Pollutant | CAS# | NRWQC for HH Publication Year | IDEM Down State – Duly Adopted? (Date) | IDEM Great Lakes System - Duly Adopted? (Date) | IDEM explanation for not adopting NRWQC for HH at 304(a) of CWA (NRWQC) |
|---|---|---|---|---|---|
| Butylbenzyl Phthalate | 85687 | 2015 | No | No | a |
| Carbon Tetrachloride | 56235 | 2015 | No | No | a |
| Chlordane | 57749 | 2015 | No | No | a |
| Chlorobenzene | 108907 | 2015 | No | No | a |
| Chlorodibromomethane | 124481 | 2015 | No | No | a |
| Chloroform | 67663 | 2015 | No | No | a |
| Chlorophenoxy Herbicide (2,4-D) | 94757 | 2015 | No | No | a |
| Chlorophenoxy Herbicide (2,4,5-TP) | 93721 | 2015 | No | No | a |
| Chrysene | 218019 | 2015 | No | No | a |
| Cyanide | 57125 | 2015 | No | No | a |
| Cylindrospermopsin | 143545908 | 2019 | No | No | IDEM applies the recreational criterion as a swimming advisory, not to be exceeded on any single day. |
| Dibenzo(a,h)anthracene | 53703 | 2015 | No | No | a |
| Dichlorobromomethane | 75274 | 2015 | No | No | a |
| Dieldrin | 60571 | 2015 | No | No | a |
| Diethyl Phthalate | 84662 | 2015 | No | No | a |
| Dimethyl Phthalate | 131113 | 2015 | No | No | a |
| Di-n-Butyl Phthalate | 84742 | 2015 | No | No | a |
| Dinitrophenols | 25550587 | 2015 | No | No | a |
| Endosulfan Sulfate | 1031078 | 2015 | No | No | a |
| Endrin | 72208 | 2015 | No | No | a |
| Endrin Aldehyde | 7421934 | 2015 | No | No | a |
| Ethylbenzene | 100414 | 2015 | No | No | a |
| Fluroanthene | 206440 | 2015 | No | No | a |
| Fluorene | 86737 | 2015 | No | No | a |
| gamma-Hexachlorocyclohexane (HCH) - Technical (Lindane) | 58899 | 2015 | No | No | a |
| Heptachlor | 76448 | 2015 | No | No | a |
| Heptachlor Epoxide | 1024573 | 2015 | No | No | a |
| Hexachlorobenzene | 118741 | 2015 | No | No | a |
| Hexachlorobutadiene | 87683 | 2015 | No | No | a |

| Pollutant | CAS# | NRWQC for HH Publication Year | IDEM Down State – Duly Adopted? (Date) | IDEM Great Lakes System - Duly Adopted? (Date) | IDEM explanation for not adopting NRWQC for HH at 304(a) of CWA (NRWQC) |
|---|---|---|---|---|---|
| Hexachlorocyclohexane (HCH)-Technical | 608731 | 2015 | No | No | a |
| Hexachlorocyclopentadiene | 77474 | 2015 | No | No | a |
| Hexachloroethane | 67721 | 2015 | No | No | a |
| Indeno(1,2,3-cd)pyrene | 193395 | 2015 | No | No | a |
| Isophorone | 78591 | 2015 | No | No | a |
| Methylmercury | 22967926 | 2001 | No | No | Until implementation issues are resolved, IDEM does not plan to replace the current water column criterion for mercury with the fish-tissue based methylmercury water quality criterion. |
| Methoxychlor | 72435 | 2015 | No | No | a |
| Methyl Bromide | 74839 | 2015 | No | No | a |
| Methylene Chloride | 75092 | 2015 | No | No | a |
| Microcystins | 101043372 | 2019 | No | No | IDEM applies the recreational criterion as a swimming advisory, not to be exceeded on any single day. |
| Nickel | 7440020 | 1998 but revised in 2002 to reflect IRIS reference dose. | Yes | No | IDEM adopted EPA's Nickel human health criterion for waters outside of the Great Lakes system. EPA approved the metals rulemaking package on February 1, 2022. |
| Nitrobenzene | 98953 | 2015 | No | No | a |
| Nitrosodibutylamine, N | 924163 | 2002 | No | No | b |
| Nitrosodiethylamine, N | 55185 | 2002 | No | No | b |
| Nitrosopryrrolidine, N | 930552 | 2002 | No | No | b |
| N-Nitrosodimethylamine | 62759 | 2002 | No | No | b |
| N-nitrosodi-n-Propylamine | 621647 | 2002 | No | No | b |
| N-Nitrosodiphenylamine | 86306 | 2002 | No | No | b |
| Pathogen and Pathogen Indicators | NA | 2012 | No (IDEM adopted its recreational | No (IDEM adopted its recreational | IDEM has adopted elements of the 2012 NRWQC, including the indicator organism, magnitude, duration and frequency for the estimated illness rate of 36 per 1,000 |

| Pollutant | CAS# | NRWQC for HH Publication Year | IDEM Down State – Duly Adopted? (Date) | IDEM Great Lakes System - Duly Adopted? (Date) | IDEM explanation for not adopting NRWQC for HH at 304(a) of CWA (NRWQC) |
|---|---|---|---|---|---|
| | | | criteria in 2008) | criteria in 2008) | primary contact recreators: i.e., the geometric mean must not exceed 126 cfu *E. coli* /100 mL in any thirty-day interval. IDEM's criteria also include a Beach Action Value of 235 cfu *E. coli* /100 mL. IDEM's rule does not include a Statistical Threshold Value, where 10% of samples can exceed 410 cfu *E.coli*/100 mL. IDEM rules allow 10% of samples collected by NPDES permitted facilities that disinfect their effluent to exceed 235 cfu *E.coli*/100 mL in a 30-day period. IDEM's current rules are more stringent than EPA's 2012 Recreational RWQC. IDEM does not have any current plans to revise its recreational *E. coli* standard. |
| Pentachlorobenzene | 608935 | 2015 | No | No | a |
| Pentachlorophenol | 87865 | 2015 | No | No | a |
| Phenol | 108952 | 2015 | No | No | a |
| Polychlorinated Biphenyls (PCBs) | - | 2002 | No | No | b |
| Pyrene | 1290000 | 2015 | No | No | a |
| Selenium | 7782492 | 2002 | Yes | No | IDEM completed a metals rulemaking that included updating human health criteria for Selenium for waters outside of the Great Lakes System. EPA approved the metals rulemaking package on February 1, 2022. |
| Tetrachloroethylene | 127184 | 2015 | No | No | a |
| Thallium | 7440280 | 2003 | No | No | The USEPA IRIS removed the reference dose (RfD) value used to derive the 2003 NRWQC for thallium following a 2009 reassessment that concluded there was |

| Pollutant | CAS# | NRWQC for HH Publication Year | IDEM Down State – Duly Adopted? (Date) | IDEM Great Lakes System - Duly Adopted? (Date) | IDEM explanation for not adopting NRWQC for HH at 304(a) of CWA (NRWQC) |
|---|---|---|---|---|---|
| | | | | | inadequate information to assess carcinogenic potential. IDEM will retain the current thallium criterion for waters outside of the Great Lakes System. |
| Toluene | 108883 | 2015 | No | No | a |
| Toxaphene | 8001352 | 2015 | No | No | a |
| Trichloroethylene | 79016 | 2015 | No | No | a |
| Vinyl Chloride | 75014 | 2015 | No | No | a |
| Zinc | 7440666 | 2002 | Yes | No | IDEM completed a metals rulemaking that included updating human health criteria for Zinc for waters outside the Great Lakes System. EPA approved the metals rulemaking package on February 1, 2022. |
| 1,1,1-Trichloroethane | 71556 | 2015 | No | No | a |
| 1,1,2,2-Tetrachloroethane | 79345 | 2015 | No | No | a |
| 1,1,2-Trichloroethane | 79005 | 2015 | No | No | a |
| 1,1-Dichloroethylene | 75354 | 2015 | No | No | a |
| 1,2,4,5-Tetrachlorobenzene | 95943 | 2015 | No | No | a |
| 1,2,4-Trichlorobenzene | 120821 | 2015 | No | No | a |
| 1,2-Dichlorobenzene | 95501 | 2015 | No | No | a |
| 1,2-Dichloroethane | 107062 | 2015 | No | No | a |
| 1,2-Dichloropropane | 78875 | 2015 | No | No | a |
| 1,2-Diphenylhydrazine | 122667 | 2015 | No | No | a |
| Trans-1,2-Dichloroethylene | 156605 | 2015 | No | No | a |
| 1,3-Dichlorobenzene | 541731 | 2015 | No | No | a |
| 1,3-Dichloropropene | 542756 | 2015 | No | No | a |
| 1,4-Dichlorobenzene | 106467 | 2015 | No | No | a |
| 2,3,7,8-TCDD (Dioxin) | 1746016 | 2002 | No | No | b |
| 2,4,5-Trichlorophenol | 95954 | 2015 | No | No | a |
| 2,4,6-Trichlorophenol | 88062 | 2015 | No | No | a |
| 2,4-Dichlorophenol | 120832 | 2015 | No | No | a |
| 2,4-Dimethylphenol | 105679 | 2015 | No | No | a |

| Pollutant | CAS# | NRWQC for HH Publication Year | IDEM Down State – Duly Adopted? (Date) | IDEM Great Lakes System - Duly Adopted? (Date) | IDEM explanation for not adopting NRWQC for HH at 304(a) of CWA (NRWQC) |
|---|---|---|---|---|---|
| 2,4-Dinitrophenol | 51285 | 2015 | No | No | a |
| 2,4-Dinitrotoluene | 121142 | 2015 | No | No | a |
| 2-Chloronaphthalene | 91587 | 2015 | No | No | a |
| 2-Chlorophenol | 95578 | 2015 | No | No | a |
| 2-Methyl-4,6-Dinitrophenol | 534251 | 2015 | No | No | a |
| 3,3'-Dichlorobenzidine | 91941 | 2015 | No | No | a |
| 3-Methly-4-Chlorophenol | 59507 | 2015 | No | No | a |
| p,p'-Dichlorodiphenyldichloroethane (DDD) | 72548 | 2015 | No | No | a |
| p,p'-Dichlorodiphenyldichloroethylene (DDE) | 72559 | 2015 | No | No | a |
| p,p'-Dichlorodiphenyltrichloroethane (DDT) | 50293 | 2015 | No | No | a |

*NRWQC for HH: National Recommended Water Quality Criteria for Human Health at Section 304(a) of the Clean Water Act*

a. As presented during the December 2024 Water Quality Standards Review presentation, IDEM intends to adopt USEPA's 2015 NRWQC for the protection of human health in waters inside and outside of the Great Lakes System as part of a planned rulemaking. The 2015 NRWQC includes 94 chemical pollutants, including the referenced chemical, updated human health exposure factors, and updated chemical specific inputs. As part of another rulemaking, IDEM plans to update the human health methodology for waters outside of the Great Lakes System, where appropriate, so it is equivalent to the human health methodology for the Great Lakes System.

b. IDEM will update its current water quality criteria for human health for this chemical in waters outside of the Great Lakes System to the NRWQC as part of a planned future rulemaking to update the human health methodology for waters outside of the Great Lakes System. If appropriate, IDEM will add this NRWQC for human health to Indiana's water quality standards for Great Lake System waters.

Appendix F

Public Notice Comment Letters from Hoosier Environmental Council and the Indiana Manufacturers Association, Inc.

Indiana Manufacturers Association, Inc.
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January 3, 2025 ELECTRONICALLY SUBMITTED

Notice of Review of WQS
Gabby Ghreichi
Surface Water Quality Standards Coordinator
Office of Water Quality
Indiana Department of Environmental Management
100 North Senate Ave.
Indianapolis, Indiana 46204-2251

**Subject: Comments on Notice of Review of WQS**
**Published in the *Indiana Register* on November 20, 2024**
**DIN: 20241120-IR-318240479ONA**

Dear Ms. Ghreichi:

The Indiana Manufacturers Association submits the following comments and suggestions regarding the "Notice of Review of Water Quality Standards and Public Hearing" published in the *Indiana Register* on November 20, 2024. The Indiana Manufacturing Association (IMA) is a voluntary, non-profit trade association representing nearly 2,000 companies and 600,000 manufacturing jobs. IMA members have facilities in Indiana that could be considerably impacted by the adoption of the rules concerning use of aquatic life criteria methodologies for waters outside of the Great Lakes system and adopting new and updated human health ambient water quality criteria for 94 chemical pollutants that EPA developed as National Recommended Water Quality Criteria (NRWQC).

The Notice states that the "overall priority" for IDEM is to make standards consistent for all waters, which includes both the waters within the Great Lakes System and those outside of the Great Lakes System, commonly referred to as "downstate."

The primary reason for Indiana water quality standards rules outside of the Great Lakes system is for setting aquatic life water quality standards as needed to comply with the United States Environmental Protection Agency (US EPA) "Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses" published in 1985. Adoption of the Aquatic Life Methodology Rules is not required by the Guidelines, nor by federal law. Moreover, some of these revisions will require significant changes in facility operations, and could cause additional restrictions on existing, new, and increased discharges that will have minimal impact on water quality. These changes will impose additional compliance costs and could adversely impact economic growth and employment in the State. Despite these impacts, we

believe that there will be little environmental benefit from applying these Great Lakes system requirements across all of Indiana. Therefore, we urge IDEM and the Environmental Rules Board to consider whether adoption of the Aquatic Life Methodology Rules is truly necessary and whether its benefits justify the resulting social and economic impacts.

An initial review of the revised EPA human health criteria has identified serious scientific concerns regarding the methodology used to derive the new recommended criteria. We urge IDEM to ensure that these new criteria truly reflect sound scientific conclusions as to the levels that are necessary to protect public health.

In reviewing these criteria and available background scientific materials, the regulated community has identified several overall concerns regarding the criteria, as well as a series of specific problems as to particular elements of EPA's methodology. These issues need to be considered and addressed before the IDEM finalizes any new recommended EPA human health criteria.

The IMA and its members have actively participated in IDEM's water quality rulemaking activities for more than 30 years. The IMA submitted detailed comments on the original adoption of water quality standards for the entire state and the Great Lakes system. These past submissions provide a complete description of our positions on each aspect of surface water quality standards, and are incorporated into our comments by reference.

The comments and suggestions below highlight issues particularly important to the IMA and its members. If you have any questions or need additional information on any issue raised in these comments, please contact me by email (aeller@indianamfg.com) or by phone (317) 217-6992.

Respectfully,

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## INTRODUCTION

The IMA and its members have actively participated in IDEM's water quality rulemaking activities since 1990. The IMA submitted detailed comments on the original adoption of water quality standards for the entire state and the Great Lakes system. These past submissions provide a complete description of our positions on each aspect of surface water quality standards, and are incorporated into these comments by reference. IMA submits the comments below based on the November 20, 2024 *Indiana Register* notice.

## A. COMMENTS ON ADOPTING THE STATEWIDE USE OF THE GREAT LAKES SYSTEM WATER QUALITY STANDARDS AND CRITERIA CALCUATION METHODOLGIES.

1. *IDEM is not required to adopt either the Guidelines or other nationally recommended criteria.*

IDEM contends that Aquatic Life Methodology Rules should be adopted because it is required by U.S. EPA. That is not the case, however. In July 2015 EPA stated in its "Summary of WQS Regulatory Revisions Final Rule" (EPA 820-S-15-002) that it had amended 40 CFR §131.20(a) to clarify that if a state or tribe chooses not to adopt new or revised criteria for any parameters for which EPA has published new or updated criteria recommendations under CWA section 304(a), they must explain their decision when reporting the results of their triennial review to EPA under CWA section 303(c)(1) and 40 CFR 131.20(c). Even though the downstate methodology is a streamlined version of the U.S. EPA 1985 national methodology, it can continue to be allowed for use pursuant to these requirements.

2. *IMA continues to be concerned about the use of Tier II values to derive enforceable permit limits. IMA believes that the Tier II approach and values are not scientifically valid for use in a regulatory framework for setting criteria.*

The Great Lakes system methodology for calculating Tier I criteria for aquatic life protection is a reasonable interpretation of the 1985 National Guidelines (EPA, 1985, *Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses*). However, that is not the case with the Tier II approach, which is not included in the Guidelines and poses significant concerns for IMA members. Our major concerns with the proposed Tier II approach include:

a. The development of Tier II values on the basis of inadequate scientific data;

b. The potential impracticality and inequity of requiring individual dischargers to develop Tier I criteria; and
c. The inability for permit limits based on Tier II values to be revised due to the "anti-backsliding" policy.

Indiana law authorizes the board to adopt rules concerning substances that lead to destruction of fish or injuriously affect growth or propagation of fish or other beneficial animal or vegetable life. IDEM must demonstrate that the Aquatic Life Methodology Rules are necessary to achieve these goals. In the absence of such a demonstration, the Aquatic Life Methodology Rules should not be adopted. IMA encourages IDEM to limit the use of the Tier II methodology to the Great Lakes basin. If expanded to downstate dischargers, Tier II values should be used only to determine when a permittee or regulatory agency must collect additional data on the toxicity and fate of a specific pollutant, rather than to establish enforceable numeric permit limits.

The GLI Tier II methodology has questionable scientific validity. The U.S. EPA Science Advisory Board (SAB) expressed reservations about the use of minimal data (as little as one aquatic toxicity test) to calculate Tier II values.

The SAB also advised against using Tier II values as permit limits, stating in its report that:

> "The Subcommittee endorses the original intent of using Tier II numbers to identify those contaminants of concern which need additional toxicity data. However, the Subcommittee is concerned that the Tier II values might be adopted as regulatory limits for point source dischargers. The Tier II numbers were designed to be overprotective in the arbitrary choices of percentage distributions from the original data set. These numbers should only be used as interim narrative standards not as numeric limits." (See page 12 of the SAB Report on the GLI Guidance).

IDEM should not adopt the Tier II methodology for downstate dischargers—particularly for use of Tier II values to establish enforceable numeric permit limitations—without addressing the concerns raised by the SAB, U.S. EPA's independent peer reviewer of the science underlying its regulations.

3. *IDEM has not articulated a scientifically valid basis for replacing the downstate aquatic life calculation methods with the Great Lakes system methods.*

In the first notice, IDEM stated that the methodology for deriving the Acute Aquatic Criteria (AAC) and Chronic Aquatic Criteria (CAC) for downstate waters needed to

reflect the "more scientifically sound" and up-to-date methods that are already in rules for waters within the Great Lakes System. The second reason cited for this rulemaking was to "promote sound and consistent" water quality management policies in downstate waters to improve and protect water resources and make the methodologies used for deriving numeric WQC consistent throughout the state.

IMA believes IDEM needs to clearly explain in detail why the Great Lakes system methods are "more scientifically sound." IMA disagrees that the Tier II approach is more scientifically sound. Moreover, the Great Lakes system is very different than downstate water systems. IMA does not support this rulemaking as an exercise for "consistency," since IDEM has been managing under the existing rules, including differences between Great Lakes and downstate systems, for more than 20 years. Some states in the Midwest (Wisconsin and Ohio are two examples) have likewise adopted more than two sets of aquatic life criteria because not all surface waters are the same.

4. *Existing discharges with limits for substances based on existing calculated aquatic life water quality criteria have to meet permit limits based on the lower aquatic life criteria and likely will not be eligible for using any new, less stringent calculated values.*

The supplemental document entitled "First Notice of Rulemaking: Aquatic Life Methodology" gives the impression that several substances will have less stringent aquatic life criteria, and that discharger will be eligible to use them. IDEM should clearly explain that only new discharges after this rulemaking would be eligible for using these less stringent criteria. Existing discharges would be subject to anti-backsliding provisions and would most likely have to provide an antidegradation demonstration even if backsliding were allowed. IMA believes this is inequitable.

One of IMA's members has already identified that at least one of the more stringent chronic aquatic life criteria would trigger the need to install more than $3,000,000 in wastewater treatment equipment and spend hundreds of thousands of dollars per year in operation and maintenance costs.

5. *IDEM needs to make publicly available the "fact sheet" for each of the Tier II values it has calculated.*

IDEM stated that it has prepared a fact sheet, available for public review, for each derived criteria, which documents the aquatic species toxicity endpoints, reference studies, and methodologies used for the calculation. IMA members have accessed the IDEM website and IDEM Virtual File cabinet and have not been successful at finding these fact sheets. IMA requests that IDEM either provide these fact sheets for all Tier II

values shown in Appendix 1 and Appendix 2 more transparently on its website or provide user instructions on how to locate these fact sheets for the substances listed in the found in the three tables shown in the Great Lakes Basin Derived Criteria [PDF] and Non-Great Lakes Basin Derived Criteria [PDF] files located on the IDEM website at: IDEM: Water Quality In Indiana: Water Quality Standards.

6. *Developing the data required to establish Tier I Criteria for substances with Tier II values may be impractical and economically prohibitive.*

Tier II values are intended to be very conservative, and would lead to much more stringent downstate permit limits if used for that purpose. The only way for a discharger to avoid that result would be to develop a complete Tier I database for the substance at issue. In fact, the Tier II values approach is intended to encourage dischargers to develop a complete Tier I database for pollutants with insufficient data to derive a Tier I criterion (see 58 Fed. Reg. 20837). For small businesses, the cost of obtaining such data would likely be prohibitive. The estimated cost of developing a complete database to calculate Tier I aquatic life criteria for a single chemical is now more than $100,000, based on analysis by the U.S. EPA SAB. Even the use of short term chronic tests, as recommended by the SAB, would today cost more than $10,000 for two matrices and two aquatic organisms, and these tests would not be sufficient to calculate a Tier I criterion.

Even for large companies, testing aquatic organisms in the 8 families required to develop a Tier I aquatic life criterion and developing scientifically-supported acute-chronic ratios may be difficult as well as costly. Culturing indigenous aquatic species in 8 families, in sufficient number to conduct multiple toxicity tests, is difficult; indeed, most commercial laboratories are not capable of performing these tests. For this reason, much of the available aquatic toxicity data have been developed in university and EPA research laboratories. It would be difficult for dischargers to develop the data for additional pollutants, at least in the amount of time that compliance schedules would typically provide under the rule.

Accordingly, although the Tier II approach might provide an incentive for dischargers to develop the data needed to support Tier I criteria, as a practical matter such criteria will not be developed in many instances. As a result, facilities will be required to comply with overly stringent limits based on extremely conservative Tier II values.

The Tier II approach that IDEM uses develops numeric values and numeric permit limits for specific substances that will result in significant expenditures by IMA members to comply with limits that may not be necessary or may be overly stringent.

IMA maintains that there are other, proven, scientifically-supported mechanisms to ensure the protection of water quality where there are inadequate data to develop valid water quality criteria. Accordingly, IMA recommends that the proposed Tier II values should not be applied in all situations, and that proven methods such as WET testing be utilized instead.

7. *The proposed rule should not replace the downstate criteria for metals in 327 IAC 2-1-6 Table 6-3 with the metals criteria for the Great Lakes system in 327 IAC 2-1.5-8 Table 8-2.*

Although IDEM indicated that it used the calculation methodologies in in 327 IAC 2-1 and 327 IAC 2-1.5 to calculate acute and/or chronic aquatic life criteria for many chemicals that do not have criteria in the rules, it is unclear whether IDEM would also be replacing the metals criteria outside of the Great Lakes system with the metals criteria applicable to the Great Lakes System. If so, this could be very problematic for many discharges, because the chronic aquatic life criteria (at a hardness of 300 mg/L $CaCO_3$) for arsenic, chromium III, copper and nickel would decrease by 21%, 59%, 21%, and 67%, respectively. It should also be noted that any increases in criteria for other metals likely would not be available for use in setting increased discharge limits due to anti-backsliding provisions.

8. *IDEM should evaluate the impact of the Great Lakes system methodologies on the hundreds of water treatment additive approvals that it has conducted for downstate discharges.*

IDEM should clearly explain how these proposed methodologies would impact the use of water treatment additives. Like discharges of other substances, only new discharges of water treatment additives after this rulemaking would be eligible to use any less stringent values. IMA believes this would be inequitable. IDEM should clarify whether existing discharges of water treatment additives would be subject to anti-backsliding provisions.

9. *IMA also opposes the use of Tier II values because anti-backsliding will prevent adjustments to permit limits.*

U.S. EPA has argued that "in most cases" the anti-backsliding provisions of the Clean Water Act (CWA) "will not prevent adjustments in limits based on Tier II values when less stringent Tier I criteria are subsequently developed. (58 Fed. Reg. 20837)." U.S. EPA bases its assertion on two factors:

(1) anti-backsliding does not apply to changes made in an effluent limit prior to its compliance date; and

(2) relaxation of water quality-based limits is acceptable if the requirements of Clean Water Act (CWA) §303(d)(4) are met.

Neither of these exceptions to the anti-backsliding rule is likely to provide relief to downstate dischargers here, however. In the first instance, the maximum allowable compliance period is only 3 years. As discussed above, conducting aquatic toxicity studies to provide reliable data for the 8 families required to develop a Tier I criterion is not a routine exercise. Thus, it may be difficult or impossible for most, if not all dischargers to complete the required toxicity studies and modify permit limits based on Tier II values prior to the effective date of those limits.

Moreover, CWA Sections 303(d)(4)(A) and (B) similarly do not guarantee that a Tier II value-based permit limit, once established, will be rolled back when new data become available. Section 303(d)(4)(A), which applies to water quality-based limits for discharges to waters that are not attaining a water quality standard, allows less stringent permit limits only if the existing limit was based on a total maximum daily load (TMDL) or other waste load allocation and attainment of the water quality standard is assured by the revised TMDL or waste load allocation. This provision will not apply to any Tier II-based permit limits unless there has been a determination that the receiving water is not attaining its designated use(s) because of the Tier II pollutant, and the revised limit will assure attainment of the uses. This situation will rarely, if ever, exist.

Section 303(d)(4)(B) allows establishment of less restrictive water quality-based effluent limits, so long as the revised permit limits are consistent with a state's antidegradation policy and assures compliance with applicable water quality standards. The antidegradation provisions of the state rules are so restrictive, however, that it may be impossible for a discharger to satisfy the antidegradation requirement of Section 303(d)(4)(B).

Another important consideration is the public outcry that would accompany any permit limit increase based on later-developed Tier I criteria. The public is unlikely to consider any upward adjustment of a permit limit as acceptable, even if the scientific evidence supports such an adjustment. Regulatory agencies in such circumstances may be more strongly influenced by adverse public reaction than by the scientific merits of the permit change. Thus, once a numerical water quality-based permit limit is specified for a particular pollutant based on a Tier II value, it will be very difficult as a practical matter for a regulatory agency to revise the limit upward, even when scientifically and environmentally appropriate. Accordingly, IDEM cannot rely on exceptions to the anti-backsliding rules as a mechanism for correcting overly stringent permit limits based on inadequate scientific data.

10. *IDEM should not make CWA Section 303(d) impairment determinations based on Tier II values.*

As explained in one of the comments above, there remains significant scientific uncertainty and conservatism built into Tier II values. IMA believes IDEM should evaluate the impact of this proposed rulemaking on waters that have been included in the Indiana 303(d) list of impaired waters, and how this rule could impact listings already approved by U.S. EPA. Specifically, IMA encourages EPA not to use a Tier II value, by itself, to determine that a waterbody is impaired. Similarly, a Tier II value should not be used as the sole basis for determining allowable loadings when the State calculates a Total Maximum Daily Load (TMDL) for a waterbody.

11. *If the Tier II methodology is adopted statewide, IMA recommends additional modifications.*

As discussed above, IMA has strong concerns about the use of Tier II values for downstate waters. If, however, IDEM determines that the Tier II methodology should be adopted, IMA recommends that it be carefully limited and modified to address the concerns outlined in these comments. In addition, IMA encourages IDEM to consider the following modifications to the Tier II approach.

No Tier II values should be developed using only one data point. More specifically, no Tier II values should be developed unless there are data from at least one daphnid test and one test from either a fathead minnow, bluegill, or rainbow trout. To use only daphnid data to establish a Tier II value would result in extremely stringent permit limits based on very little information, which likely would be overly conservative.

Tier II values should be developed only for substances that are covered by the original study used to develop the Tier II methodology (Host et al. 1991). This would include the 138 pollutants of initial focus listed by U.S. EPA in 40 CFR part 132, Table 6 of the GLI rule. There is no evidence that the Tier II process is technically appropriate for other substances, so it should not be used to establish enforceable numeric permit limits for those substances. In particular, use of Tier II values is inappropriate for major cations and anions, and for water/wastewater treatment additives.

Finally, IMA recommends that the Tier II methodology be modified to allow flexibility if strict application of its requirements does not yield scientifically sound values. Under the GLI Tier II methodology, even if the Tier II value is not consistent with other available data (such as fate and transport information), the only alternative is to recalculate the value using the Tier II process, which will not yield a different result. The Tier II process should be revised to clarify that if a Tier II value is not consistent with available scientific evidence, IDEM may develop a revised value, considering that evidence and using any scientifically sound calculation method.

**B. COMMENTS ON ADOPTING THE UPDATED NATIONAL RECOMMENDED WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH.**

1. *The methodology used to develop the new criteria reflects significant changes from EPA's own adopted Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health.*[1]

It is improper for EPA to develop new criteria using a methodology that differs from EPA-adopted procedures. Before adopting new criteria, EPA should have proposed revisions to its own methodology, so the public could comment on those methodology changes before reviewing these new human health criteria that are developed using the new process. IDEM likewise should not set State standards based on flawed or unapproved methodologies and should address each concern with the methodologies used by EPA as detailed, below.

2. *Many of the changes in the new criteria process are the result of policy changes, rather than being due to new science.*

IDEM should look into how the EPA addresses the use of a single default Relative Source Contribution (RSC) value in the use of Great Lakes-specific model parameters for waters outside of the Great Lakes Basin and the use of a model that limits the ability to develop site-specific solutions. EPA should have made these policy changes transparent when the new draft methodology was published and should have made this information open to public review and comment before criteria are developed (and implemented) that are based on the new policies.

3. *EPA has not addressed issues raised by its own Science Advisory Board (SAB) regarding the Agency's method for developing criteria.*

IDEM should address the EPA SAB concerns and make appropriate revisions before new human health criteria are adopted using the new EPA approach.

4. *IDEM should use a probabilistic approach for setting human health criteria, which provides much more realistic estimates of risk*

EPA has used a deterministic procedure, and selected upper-percentile values for nearly all of the parameters in the criteria derivation equation. This has resulted in criteria that are far more stringent than is necessary to protect public health. Use of a probabilistic approach, which provides much more realistic estimates of risk, is feasible

[1] http://water.epa.gov/scitech/swguidance/standards/criteria/health/methodology/in dex.cfm

to use and should be seriously considered by the Agency for use in developing scientifically sound, realistic water quality criteria.

EPA has released a Risk Assessment Forum White Paper on probabilistic risk assessment (PRA). (http://www.gpo.gov/fdsys/pkg/FR-2014-08-12/pdf/2014-19065.pdf.) The White Paper identifies situations in which PRA "may be particularly useful," including situations in which "uncertainty in some aspect of the risk assessment is high, and decisions are contentious or have large resource implications," as well as situations in which "the scientific rigor and quality of the assessment is critical to the credibility of the EPA decision." The development of water quality criteria to protect human health fits well into those criteria for use of PRA, further supporting the need for the Agency to apply the PRA approach in developing these criteria.

A number of regulated parties have supported development of a statistical tool that will enable agencies to readily calculate water quality criteria using a PRA approach. That tool has been presented to EPA, and the IMA supports its use. IDEM should use that tool to develop PRA- based criteria.

5. *The new human health criteria are, in general, much more stringent than EPA's existing recommended criteria, and are not scientifically justified.*

Some of the new EPA human health criteria are set at levels that are considerably lower than measured ambient concentrations in waterbodies. An example is the Ohio River, where ambient levels for various organics are much greater than the new criteria: www.orsanco.org/organics-detection-system-84.

Use of the new numbers will result in many new impaired waters, many new total maximum daily loads (TMDLs), many new, stringent permit limits, and resulting high compliance costs for regulated facilities, with little or no public health benefit.

6. *Use of compounded conservative assumptions in developing new criteria is not scientifically justified and contrary to EPA policy.*

EPA's use of compounded conservative assumptions in developing the new human health criteria is not only improper as a scientific matter; it is also contrary to EPA's own policy documents, which recognize that the Agency does not need to use excessively conservative input values on all equation parameters in order to yield adequately protective regulations.

7. *The derivation and use of the EPA fish consumption rates (FCRs) have not been adequately peer-reviewed or validated against other established methods.*

The method used by EPA to derive fish consumption rates (FCRs) has not been adequately peer-reviewed by experts outside of the Agency, and the data and supporting documentation needed to allow an external review have not been made publicly available.

EPA has not provided an adequate rationale for the use of its unvalidated FCR method instead of the recognized method established by the National Cancer Institute (NCI).

In deriving FCRs, EPA has improperly factored in marine species that are not exposed to pollutant levels in local waters for significant periods of time.

8. *EPA's assumptions about the volume and source of water that people drink is flawed.*

EPA's assumption that people drink 3 liters of water per day has no relation to the actual amounts of untreated surface water ingested by humans, and contributes to an unrealistic exposure scenario that is used to develop the criteria.

9. *IDEM needs use Relative Source Contribution (RSC) values that more accurately reflect fish and water exposure.*

EPA has not adequately justified use of a Relative Source Contribution (RSC) value in its criteria equation. The EPA criteria inappropriately compensate for sources of the pollutant unrelated to fish and water exposure by reducing the water quality criteria levels. IDEM needs use RSC values that more accurately reflect fish and water exposure.

If an RSC value is to be used, EPA's default RSC value is unnecessarily conservative and contributes to an inaccurate risk calculation. Data-based RSC values have been derived for many substances, and they are generally much higher than EPA's 20% value.

10. *IDEM should not assume that all fish and shellfish consumed are caught in local waters.*

EPA has assumed that all fish and shellfish that are consumed are caught in local waters, so that the water quality criteria for those waters must reflect high consumption of the fish and shellfish that are present. This assumption has no basis – over 90% of seafood consumed in the U.S. is imported.

11. *IDEM should reexamine EPA's criteria based on developmental effects and how they are impacted by EPA's lifetime exposure assumptions.*

For pollutants whose toxicity is based on developmental effects, EPA's use of adult exposure parameters (i.e., assuming lifetime exposure) in deriving criteria results in levels that are lower than the actual toxicity data justify.

12. IDEM needs to use fish lipid levels that on average reflect species present in Indiana waters.

In calculating the criteria, EPA uses fish lipid levels that are much higher than the lipid levels seen in most species present in U.S. waters. This assumption contributes to unrealistically low criteria.

13. *IDEM should ensure that the best available science is used to set water quality criteria.*

For all water quality criteria updates, the Agency should ensure that it uses the best available science. For example, the EPA criteria updates for chloroform, 1,2-dicholoethane, and toluene all use data from dated Integrated Risk Information System (IRIS) assessments that are more than a decade old. IDEM should be mindful that these dated assessments may not be the most relevant or up-to-date sources of data for the revision of these criteria. In addition, IRIS is undergoing significant reforms, especially in its Problem Formulation, Evidence Integration, and Uncertainty Assessment areas. These elements of systematic review should be acknowledged and provided for in developing water quality criteria.

14. *The model and methodology used by EPA to derive bioaccumulation factors (BAFs) have substantial problems, when used to derive criteria, which bring into question the scientific basis for those criteria.*

IDEM should address the following model and methodology problems and issues associated with the EPA human health criteria:

- The model is based on the Great Lakes food web, so it overstates bioaccumulation in waters in other areas of the country, including the downstate area.
- The model does not account for metabolism of substances in the gut, which plays an important role in determining the extent to which those substances will actually bioaccumulate in the food web.
- EPA has ignored cautions stated by the SAB as to whether the model used here, without further consideration of bioaccumulation, is appropriate to be used in developing criteria.

- EPA appears to have consistently chosen high default values for the input values in its equation, resulting in a high bias in the derived BAFs (and correspondingly low criteria values).
- The EPA model derives estimates of bioaccumulation that are far higher than if water column and fish levels of a substance are measured directly. As a result, the new approach treats substances as bioaccumulative, needing stringent criteria, that show little or no evidence of actual bioaccumulation in the food web.
- The model used by EPA is not conducive to recalculations using site- specific food web data, so it will be difficult to develop site-specific BAFs and criteria that more accurately reflect real-world situations. This is inconsistent with existing EPA policy, which indicates a preference for site-specific BAFs.
- Other ways of estimating bioaccumulation are available, which EPA should evaluate to determine if they can provide more defensible estimates than the model chosen by EPA.

15. *IMA recommends that IDEM pursue the following course of action regarding the revised EPA human health criteria:*

- IDEM needs to develop new criteria using a probabilistic risk assessment (PRA) approach. It also needs to address the major scientific problems raised in these comments.
- Once IDEM has taken those actions, IDEM should finalize its new human health criteria methodology, issue supporting documentation that present the new methodology and all supporting information, and then present that documentation to an independent third party for a review, and then allow for a public review and comment on that work product.
- After those actions have been taken, and a new, final methodology is confirmed, IDEM can then develop new recommended human health water quality criteria, which should also be issued for public review and comment.

IMA appreciates the opportunity to review the proposed human health criteria, and the methodology that was used to develop those criteria. IMA is providing two following supporting reports that provide further details on the major scientific and other concerns with the proposed criteria and the methodology associated with the revised EPA human health criteria.

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Appendix 1 – Aquatic Life Criteria calculated by IDEM for waters outside of the Great Lakes system.

**Indiana Department of Environmental Management**
**Outside the Great Lakes System**
**Water Quality Criteria Calculated Using the Methodologies at 327 IAC 2-1-8.2 and 8.3**

| | | Aquatic Life Criteria and Values (µg/L) | | |
|---|---|---|---|---|
| | | Acute | Chronic | |
| CAS # | Parameter Name | Acute Aquatic Criteria (AAC) | Chronic Aquatic Criteria (CAC) | Date[1] |
| 75070 | Acetaldehyde | 1,500 | 68 | 5/29/13 |
| 120127 | Anthracene | 0.23 | 0.01 | 12/31/19 |
| 7440360 | Antimony | 720 | 210 | 8/12/21 |
| 7440417 | Beryllium | $e^{(1.6839*(\ln(H))-3.6603)}$ | $e^{(1.6839*(\mathrm{Ln}(H))-6.7738)}$ | 8/5/20 |
| 7440428 | Boron | 41,000 | 7,700 | 7/10/13 |
| 7726956 | Bromine | 3.8 | 0.17 | 5/21/08 |
| 7440484 | Cobalt | 140 | 26 | 10/22/21 |
| 156592 | 1,2-cis-Dichloroethylene | 7,200 | 320 | 4/2/08 |
| 156605 | 1,2-trans-Dichloroethylene | 18,000 | 800 | 5/22/08 |
| 60297 | Diethyl Ether | 8,300 | 370 | 3/9/10 |
| 109897 | Diethylamine | 230 | 10.2 | 9/25/20 |
| 91667 | Diethylaniline | 130 | 5.8 | 3/15/10 |
| 20461545 | Iodide | 78 | 78 | 12/31/19 |
| 7439896 | Iron | 2,744 | 2,495 | 6/10/97 |
| 7439932 | Lithium | 910 | 910 | 8/5/20 |
| 7439965 | Manganese | $e^{(0.8784*(\ln(H))+4.3075)}$ | $e^{(0.8784*(\ln(H))+3.5385)}$ | 8/4/21 |
| 7439987 | Molybdenum | 84,000 | 3,800 | 5/22/08 |
| 7440246 | Strontium | 40,000 | 46,000 | 4/24/13 |
| 127184 | Tetrachloroethylene | 1,400 | 210 | 4/14/08 |
| 7440280 | Thallium | 86 | 35 | 5/20/09 |
| 71556 | 1,1,1-Trichloroethane | 1,100 | 50 | 5/28/08 |
| 79016 | Trichloroethylene | 2,200 | 100 | 4/15/08 |
| 121448 | Triethylamine | 1,700 | 1,700 | 10/18/21 |
| 75014 | Vinyl Chloride | 11,000 | 480 | 4/2/08 |

[1]Date fact sheet for the criteria was last revised

All criteria in this table are subject to change as more data become available.

Criteria for metals in this table are in the form of total metal. Aquatic life criteria shall be expressed in the form of dissolved metal by multiplying the total metal criterion by the conversion factor. Metals without conversion factors listed in the rules or otherwise derived by EPA are assumed to have a conversion factor of 1.0.

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Appendix 2 - Aquatic Life Criteria calculated by IDEM for waters inside the Great Lakes system.

**Indiana Department of Environmental Management**
**Great Lakes System, Tier I Criteria and Tier II Values Calculated Using the Methodologies at 327 IAC 2-1.5-11 through 15**

| | | Aquatic Life Criteria and Values (µg/L) | | | | | Human Health Criteria and Values (µg/L) | | | | | | | | Wildlife Criteria (µg/L) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Acute | | Chronic | | | Human Health Noncancer | | | | Human Health Cancer | | | | | | |
| CAS # | Parameter Name | Acute (CMC) | Tier | Chronic (CCC) | Tier | Date[1] | Drinking (HNC-D) | Nondrinking (HNC-N) | Tier | Date[1] | Drinking (HCC-D) | Nondrinking (HCC-N) | Tier | Date[1] | Wildlife Criteria | Tier | Date[1] |
| 83329 | Acenaphthene | 140 | II | 27 | II | 8/17/00 | 1,200 | 4,200 | II | 3/20/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 75070 | Acetaldehyde[C] | 1200 | II | 130 | II | 8/18/00 | ------- | ------- | --- | ------ | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 34256821 | Acetochlor | ------- | --- | ------ | --- | ------ | 450 | 2300 | I | 12/4/13 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 67641 | Acetone | 15,000 | I | 1,700 | II | 8/17/00 | 25,000 | 2,000,000 | I | 2/28/08 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 107028 | Acrolein | 0.85 | II | 0.19 | II | 8/18/00 | ------- | ------- | --- | ------ | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 107131 | Acrylonitrile[C] | 570 | II | 63 | II | 3/11/14 | ------- | ------- | --- | ------ | 0.53 | 3 | I | 3/21/00 | ------- | --- | ------- |
| 15972608 | Alachlor | 190 | II | 21 | II | 8/21/00 | 210 | 820 | I | 7/15/15 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 309002 | Aldrin[C,BCC] | 0.15 | II | 0.035 | II | 8/21/00 | $8.2 \times 10^{-5}$ | $8.2 \times 10^{-5}$ | II | 4/4/00 | $2.4 \times 10^{-6}$ | $2.4 \times 10^{-6}$ | II | 3/23/00 | ------- | --- | ------- |
| 7429905 | Aluminum | ------- | --- | ------ | --- | ------ | 970 | 4,500 | II | 3/23/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 120127 | Anthracene | 6.1 | II | 0.68 | II | 8/22/00 | 590 | 630 | II | 3/23/00 | ------- | ------- | --- | ------- | | | |
| 7440360 | Antimony | 720 | II | 80 | II | 8/22/00 | 10 | 2,000 | I | 3/24/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 7440382 | Arsenic[C] | ------- | --- | ------ | --- | ------ | 10 | 230 | I | 3/23/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 1912249 | Atrazine | ------- | --- | ------ | --- | ------ | 920 | 15,000 | II | 3/12/14 | ------- | ------- | --- | ------- | | | |
| 7440393 | Barium | $e^{(1.0629*(\ln(H))+2.2349)}$ | II | $e^{(1.0629*(\ln(H))+1.1928)}$ | II | 12/1/21 | ------- | ------- | --- | ------ | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 71432 | Benzene[C] | 880 | II | 98 | II | 8/22/00 | ------- | ------- | --- | ------ | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 92875 | Benzidine[C] | 14 | II | 1.5 | II | 8/22/00 | 74 | 3,700 | I | 4/4/00 | $1.5 \times 10^{-3}$ | $7.5 \times 10^{-2}$ | I | 3/24/00 | ------- | --- | ------- |
| 65850 | Benzoic Acid | ------- | --- | ------ | --- | ------ | 110,000 | 3,900,000 | I | 12/4/13 | | | | | ------- | --- | ------- |
| 50328 | Benzo(a)pyrene[C] | ------- | --- | ------ | --- | ------ | ------- | ------- | --- | ------ | 0.032 | 0.096 | I | 12/4/13 | ------- | --- | ------- |
| 7440417 | Beryllium[C] | $e^{(1.6839*(\ln(H))-3.6603)}$ | II | $e^{(1.6839*(\ln(H))-5.8575)}$ | II | 5/22/15 | 40 | 300 | I | 3/28/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 108601 | Bis (2-chloroisopropyl) ether[C] | ------- | --- | ------ | --- | ------ | 990 | 48,000 | I | 3/31/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 542881 | Bis (chloromethyl) ether[C] | ------- | --- | ------ | --- | ------ | ------- | ------- | --- | ------ | 0.0016 | 0.11 | I | 3/31/00 | ------- | --- | ------- |
| 117817 | Bis (2-ethylhexyl)phthalate (DEHP)[C] | ------- | --- | ------ | --- | ------ | 54 | 60 | II | 4/3/00 | 2.5 | 2.8 | II | 4/3/00 | ------- | --- | ------- |
| 7440428 | Boron | 41,000 | I | 7,700 | I | 7/10/13 | ------- | ------- | --- | ------ | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 75252 | Bromoform[C] | 1,100 | II | 61 | II | 8/23/00 | 470 | 8,100 | I | 4/7/00 | 42 | 710 | I | 4/7/00 | ------- | --- | ------- |
| 78933 | 2-Butanone | 120,000 | II | 14,000 | II | 8/23/00 | 16 | 1,300 | I | 7/13/98 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 7440439 | Cadmium[C] | ------- | --- | ------ | --- | ------ | 14 | 1,400 | I | 4/7/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 75150 | Carbon Disulfide | ------- | --- | ------ | --- | ------ | 3,000 | 100,000 | I | 4/7/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 56235 | Carbon Tetrachloride[C] | 360 | II | 40 | II | 10/4/00 | 17 | 120 | I | 12/18/13 | 2.4 | 19 | I | 4/11/00 | ------- | --- | ------- |
| 124481 | Chlorodibromomethane[C] | ------- | --- | ------ | --- | ------ | 570 | 12,000 | I | 1/10/14 | 4 | 86 | I | 1/10/14 | ------- | --- | ------- |
| 67663 | Chloroform[C] | 1,300 | II | 170 | II | 10/5/00 | 350 | 11,000 | I | 4/11/00 | 56 | 1,700 | I | 4/11/00 | ------- | --- | ------- |
| 16065831 | Chromium III | ------- | --- | ------ | --- | ------ | 410,000 | 43,000,000 | I | 4/11/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 18540299 | Chromium VI | ------- | --- | ------ | --- | ------ | 230 | 25,000 | I | 4/11/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 7440508 | Copper | ------- | --- | ------ | --- | ------ | 280 | 56,000 | I | 4/12/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 7440484 | Cobalt | 120 | II | 19 | II | 1/12/01 | ------- | ------- | --- | ------ | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 21725462 | Cyanazine | 2,400 | II | 270 | II | 3/29/01 | ------- | ------- | --- | ------ | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 94757 | 2,4-D | 2,500 | II | 240 | II | 2/8/01 | 250 | 2,000 | I | 4/12/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 50293 | DDT[C,BCC] | 0.45 | I | 0.032 | II | 5/16/01 | ------- | ------- | --- | ------ | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 132649 | Dibenzofuran | 65 | II | 7.3 | II | 5/16/01 | ------- | ------- | --- | ------ | ------- | ------- | --- | ------- | ------- | --- | ------- |

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| CAS # | Parameter Name | Aquatic Life Criteria and Values (µg/L) | | | | | Human Health Criteria and Values (µg/L) | | | | | | | | Wildlife Criteria (µg/L) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Acute | | Chronic | | | Human Health Noncancer | | | | Human Health Cancer | | | | | | |
| | | Acute (CMC) | Tier | Chronic (CCC) | Tier | Date[1] | Drinking (HNC-D) | Nondrinking (HNC-N) | Tier | Date[1] | Drinking (HCC-D) | Nondrinking (HCC-N) | Tier | Date[1] | Wildlife Criteria | Tier | Date[1] |
| 84742 | Dibutyl Phthalate | 34 | II | 19 | II | 3/17/14 | 31 | 31 | II | 4/13/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 95501 | 1,2-Dichlorobenzene | 130 | II | 14 | II | 4/24/01 | 1,700 | 6,000 | I | 4/13/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 541731 | 1,3-Dichlorobenzene | 310 | II | 52 | II | 4/25/01 | ------- | ------- | --- | ------ | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 106467 | 1,4-Dichlorobenzene | 80 | II | 16 | II | 4/25/01 | ------- | ------- | --- | ------ | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 91941 | 3,3'-Dichlorobenzidine[C] | ------- | --- | ------ | --- | ------ | ------- | ------- | --- | ------ | 0.43 | 0.95 | I | 4/13/00 | ------- | --- | ------- |
| 75274 | Dichlorobromomethane[C] | ------- | --- | ------ | --- | ------ | 480 | 13,000 | I | 1/16/14 | 5.5 | 150 | I | 1/16/14 | ------- | --- | ------- |
| 75343 | 1,1-Dichloroethane | 6,600 | II | 740 | II | 6/26/01 | 1,100 | 27,000 | II | 4/17/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 107062 | 1,2-Dichloroethane[C] | 7,300 | II | 980 | II | 3/17/14 | 4 | 210 | I | 4/17/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 75354 | 1,1-Dichloroethylene | 1,900 | II | 210 | II | 4/24/01 | 240 | 4,100 | I | 4/17/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 156592 | 1,2-cis-Dichloroethylene | 5,500 | II | 620 | II | 6/26/01 | ------- | ------- | --- | ------ | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 156605 | 1,2-trans-Dichloroethylene | 5,000 | II | 560 | II | 9/19/01 | 470 | 25,000 | I | 1/16/14 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 120832 | 2,4-Dichlorophenol | 120 | II | 17 | II | 4/6/01 | 71 | 450 | I | 1/16/14 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 542756 | 1,3-Dichloropropene[C] | 17 | II | 2 | II | 4/25/01 | 940 | 46,000 | | 9/12/00 | 3.4 | 170 | I | 9/12/00 | ------- | --- | ------- |
| 60571 | Dieldrin[C, BCC] | ------- | --- | ------ | --- | ------ | ------- | ------- | --- | ------ | ------- | ------- | --- | ------- | $7.1x10^{-5}$ | I | 10/5/98 |
| 105679 | 2,4 Dimethyl phenol | 140 | II | 21 | II | | | | | | | | | | | | |
| 84662 | Diethyl Phthalate | ------- | --- | ------ | --- | ------ | 21,000 | 1,200,000 | I | 3/7/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 131113 | Dimethyl Phthalate | 2,800 | II | 1,000 | II | 4/3/01 | ------- | ------- | --- | ------ | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 122667 | 1,2-Diphenylhydrazine[C] | 9.6 | II | 1.1 | II | 4/25/01 | ------- | ------- | --- | ------ | 0.36 | 2.1 | I | 4/18/00 | ------- | --- | ------- |
| 115297 | Endosulfan | 0.10 | I | 0.05 | I | 5/16/01 | 85 | 170 | II | 3/19/14 | ------- | ------- | --- | ------ | ------- | --- | ------- |
| 72208 | Endrin[BCC] | ------- | --- | ------ | --- | ------ | 0.19 | 0.19 | II | 3/18/14 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 100414 | Ethylbenzene | 1,000 | II | 110 | II | 5/16/01 | 2,100 | 9,100 | I | 4/19/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 106934 | Ethylene Dibromide[C] | ------- | --- | ------ | --- | ------ | ------- | ------- | --- | ------ | 0.004 | 0.17 | I | 4/19/00 | ------- | --- | ------- |
| 107211 | Ethylene Glycol | 2,200,000 | II | 240,000 | II | 5/16/01 | 56,000 | 4,500,000 | I | 1/17/14 | ------- | ------- | --- | ------- | 73,000 | II | 3/15/99 |
| 16984488 | Fluoride | $e^{(0.5137*(\ln(H))-0.0369)}$ | I | $e^{(0.5137*(\ln(H))-0.7626)}$ | I | 10/28/11 | ------- | ------- | --- | ------ | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 206440 | Fluoranthene | 17 | II | 3.6 | II | 4/11/01 | 9.4 | 9.5 | II | 3/20/14 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 86737 | Fluorene | 22 | II | 2 | II | 3/20/14 | 250 | 320 | II | 3/20/14 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 50000 | Formaldehyde[C] | 660 | II | 74 | II | 5/16/01 | 4,200 | 320,000 | I | 1/17/14 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 76448 | Heptachlor[C] | ------- | --- | ------ | --- | ------ | 0.29 | 0.29 | II | 9/18/00 | 0.0016 | 0.0016 | II | 3/7/00 | ------- | --- | ------- |
| 87683 | Hexachlorobutadiene[C,BCC] | ------- | --- | ------ | --- | ------ | ------- | ------- | --- | ------ | 0.22 | 0.24 | II | 12/8/99 | ------- | --- | ------- |
| 319846 | alpha-Hexachlorocyclohexane[C,BCC] | ------- | --- | ------ | --- | ------ | ------- | ------- | --- | ------ | 0.015 | 0.027 | II | 3/20/14 | ------- | --- | ------- |
| 319857 | beta-Hexachlorocyclohexane[C,BCC] | ------- | --- | ------ | --- | ------ | ------- | ------- | --- | ------ | 0.093 | 0.18 | II | 3/9/00 | ------- | --- | ------- |
| 608731 | Hexachlorocyclohexane[C,BCC] | ------- | --- | ------ | --- | ------ | ------- | ------- | --- | ------ | 0.093 | 0.18 | II | 3/9/00 | ------- | --- | ------- |
| 77474 | Hexachlorocyclopentadiene | ------- | --- | ------ | --- | ------ | 170 | 1,500 | I | 3/15/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 78591 | Isophorone | 7,500 | II | 830 | II | 5/16/01 | 4,100 | 110,000 | I | 4/20/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 7439932 | Lithium | 910 | I | 420 | I | 8/9/21 | ------- | ------- | --- | ------ | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 7439965 | Manganese | $e^{(0.8784*(\ln(H))+2.992)}$ | I | $e^{(0.8784*(\ln(H))+2.226)}$ | I | 12/2/21 | ------- | ------- | --- | ------ | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 67561 | Methanol | 3,000 | II | 330 | II | 7/17/01 | 14,000 | 1,100,000 | I | 1/17/14 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 72435 | Methoxychlor | ------- | --- | ------ | --- | ------ | 6.3 | 6.6 | II | 1/17/14 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 74895 | Methylamine | 7,700 | II | 860 | II | 4/12/99 | ------- | ------- | --- | ------ | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 75092 | Methylene Chloride[C] | 14,000 | II | 1,500 | II | 7/17/01 | ------- | ------- | --- | ------ | ------- | ------- | --- | ------- | ------- | --- | ------- |

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| CAS # | Parameter Name | Aquatic Life Criteria and Values (µg/L) | | | | | Human Health Criteria and Values (µg/L) | | | | | | | | Wildlife Criteria (µg/L) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Acute | | Chronic | | | Human Health Noncancer | | | | Human Health Cancer | | | | | | |
| | | Acute (CMC) | Tier | Chronic (CCC) | Tier | Date[1] | Drinking (HNC-D) | Nondrinking (HNC-N) | Tier | Date[1] | Drinking (HCC-D) | Nondrinking (HCC-N) | Tier | Date[1] | Wildlife Criteria | Tier | Date[1] |
| 95487 | 2-Methylphenol | 600 | II | 67 | II | 5/15/01 | 1,400 | 44,000 | I | 1/17/14 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 106445 | 4-Methylphenol | 480 | II | 53 | II | 5/15/01 | | | | | | | | | | | |
| 1634044 | Methyl tert-Butyl Ether | 6,500 | II | 730 | II | 9/18/01 | ------- | ------- | --- | ------- | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 51218452 | Metolachlor | ------- | --- | ------- | --- | ------- | 3,000 | 11,000 | I | 1/17/14 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 7439987 | Molybdenum | 7,200 | II | 800 | II | 9/18/01 | ------- | ------- | --- | ------- | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 91203 | Naphthalene | 200 | II | 26 | II | 9/18/01 | 490 | 1,900 | I | 7/26/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 7440020 | Nickel | ------- | --- | ------- | --- | ------- | 460 | 42,000 | I | 7/26/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 98953 | Nitrobenzene | 1,000 | II | 220 | II | 9/18/01 | 13 | 28,000 | I | 7/26/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 88755 | 2-Nitrophenol | 650 | II | 73 | II | 5/15/01 | ------- | ------- | --- | ------- | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 100027 | 4-Nitrophenol | 530 | II | 58 | II | 4/14/99 | ------- | ------- | --- | ------- | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 55185 | N-Nitrosodiethylamine[C] | ------- | --- | ------- | --- | ------- | ------- | ------- | --- | ------- | 0.0023 | 0.18 | I | 8/23/00 | ------- | --- | ------- |
| 62759 | N-Nitrosodimethylamine[C] | ------- | --- | ------- | --- | ------- | ------- | ------- | --- | ------- | 0.0068 | 0.55 | I | 8/23/00 | ------- | --- | ------- |
| 924163 | N-Nitrosodi-n-butylamine[C] | ------- | --- | ------- | --- | ------- | ------- | ------- | --- | ------- | 0.06 | 0.73 | I | 8/24/00 | ------- | --- | ------- |
| 86306 | N-Nitrosodiphenylamine[C] | 220 | II | 25 | II | 9/19/01 | ------- | ------- | --- | ------- | 36 | 74 | I | 8/24/00 | ------- | --- | ------- |
| 621647 | N-Nitrosodipropylamine[C] | ------- | --- | ------- | --- | ------- | ------- | ------- | --- | ------- | 0.049 | 2.9 | I | 3/11/14 | ------- | --- | ------- |
| 930552 | N-Nitrosopyrrolidine[C] | ------- | --- | ------- | --- | ------- | ------- | ------- | --- | ------- | 0.16 | 13 | I | 3/11/14 | ------- | --- | ------- |
| 84852153 and | Nonylphenol | 28 | I | 6.6 | I | 12/05 | ------- | ------- | --- | ------- | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 608935 | Pentachlorobenzene[BCC] | 16 | II | 3.1 | II | 12/7/99 | 0.18 | 0.18 | I | 3/11/14 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 87865 | Pentachlorophenol[C] | ------- | --- | ------- | --- | ------- | 820 | 24,000 | I | 9/14/00 | 2.8 | 84 | I | 9/14/00 | ------- | --- | ------- |
| 85018 | Phenanthrene | 8.4 | II | 0.93 | II | 9/19/01 | ------- | ------- | --- | ------- | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 108952 | Phenol | 1,300 | I | 180 | II | 5/22/02 | 2,000 | 2,300 | II | 9/14/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 57556 | Propylene Glycol | 700,000 | II | 78,000 | II | 9/19/01 | 700,000 | 56,000,000 | I | 9/15/00 | ------- | ------- | --- | ------- | 900,000 | II | 3/15/99 |
| 129000 | Pyrene | ------- | --- | ------- | --- | ------- | 15 | 15 | II | 9/15/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 7782492 | Selenium | ------- | --- | ------- | --- | ------- | 140 | 3,400 | I | 9/15/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 7440224 | Silver | 0.54 | I | 0.058 | II | 1/5/09 | 130 | 26,000 | I | 9/18/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 122349 | Simazine | 80 | II | 9 | II | 9/19/01 | 140 | 3,800 | I | 8/1/97 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 7440246 | Strontium | 40,000 | I | 21,000 | II | 4/29/13 | ------- | ------- | --- | ------- | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 100425 | Styrene | ------- | --- | ------- | --- | ------- | 5,000 | 32,000 | I | 9/18/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 95943 | 1,2,4,5-Tetrachlorobenzene[BCC] | 75 | II | 8.3 | II | 12/16/99 | 0.35 | 0.36 | I | 3/17/14 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 127184 | Tetrachloroethylene[C] | 480 | II | 60 | II | 9/19/01 | 320 | 1,700 | I | 3/11/14 | 11 | 60 | I | 9/20/00 | ------- | --- | ------- |
| 7440280 | Thallium | 47 | II | 13 | II | 11/23/15 | 2 | 5 | I | 3/11/14 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 108883 | Toluene | 840 | II | 94 | II | 9/20/01 | ------- | ------- | --- | ------- | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 8001352 | Toxaphene[C, BCC] | ------- | --- | ------- | --- | ------- | ------- | ------- | --- | ------- | ------- | ------- | --- | ------- | $1.7 \times 10^{-4}$ | I | 10/14/98 |
| 56359 | Tributyltin Oxide | ------- | --- | ------- | --- | ------- | 3.3 | 5.4 | II | 4/7/14 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 71556 | 1,1,1-Trichloroethane | 3,700 | II | 410 | II | 6/1/01 | ------- | ------- | --- | ------- | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 79005 | 1,1,2-Trichloroethane | 490 | II | 87 | II | 7/17/01 | 110 | 3,000 | I | 9/27/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 79345 | 1,1,2,2-Tetrachloroethane[C] | 900 | II | 100 | II | 6/1/01 | ------- | ------- | --- | ------- | 1.6 | 17 | II | 4/7/14 | ------- | --- | ------- |
| 79016 | Trichloroethylene[C] | 2,300 | II | 260 | II | 9/21/01 | ------- | ------- | --- | ------- | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 95954 | 2,4,5-Trichlorophenol | 17 | II | 1.9 | II | 9/25/01 | 1,300 | 2,500 | II | 4/7/14 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 88062 | 2,4,6-Trichlorophenol[C] | 12 | II | 1.4 | II | 9/25/01 | ------- | ------- | --- | ------- | 27 | 200 | I | 3/11/14 | ------- | --- | ------- |

| CAS # | Parameter Name | Aquatic Life Criteria and Values (µg/L) | | | | | Human Health Criteria and Values (µg/L) | | | | | | | | Wildlife Criteria (µg/L) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Acute | | Chronic | | | Human Health Noncancer | | | | Human Health Cancer | | | | | | |
| | | Acute (CMC) | Tier | Chronic (CCC) | Tier | Date[1] | Drinking (HNC-D) | Nondrinking (HNC-N) | Tier | Date[1] | Drinking (HCC-D) | Nondrinking (HCC-N) | Tier | Date[1] | Wildlife Criteria | Tier | Date[1] |
| 7440622 | Vanadium | 79 | II | 27 | II | 4/26/11 | 230 | 2,300 | I | 9/28/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 75014 | Vinyl Chloride[C] | 8,400 | II | 930 | II | 6/26/01 | 83 | 4,900 | I | 9/28/00 | 0.25 | 14 | I | 9/28/00 | ------- | --- | ------- |
| 1330207 | Xylene | 310 | II | 35 | II | 9/21/01 | 38,000 | 150,000 | I | 9/28/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |
| 7440666 | Zinc | ------- | --- | ------ | ---- | ------ | 9,000 | 250,000 | I | 9/29/00 | ------- | ------- | --- | ------- | ------- | --- | ------- |

[1]Date fact sheet was last revised

C = substance is considered to be carcinogenic
BCC = Bioaccumulative Chemical of Concern (listed in 327 IAC 2-1.5-6(b))

All Tier I criteria and Tier II values in this table are subject to change as more data become available.

Criteria for metals in this table are in the form of total metal. Aquatic life criteria shall be expressed in the form of dissolved metal by multiplying the total metal criterion by the conversion factor. Metals without conversion factors listed in the rules or otherwise derived by EPA are assumed to have a conversion factor of 1.0.

Last modified: December ??, ????

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**December 27, 2024**

**Via Email: gghreichi@idem.in.gov.**
Gabby Ghreichi, Water quality standards coordinator
IDEM, Office of Water Quality

**NOTICE OF REVIEW OF WQS**

**Public Comments of Hoosier Environmental Council (HEC) to the Indiana's Water Quality Standards (WQS) and potential rulemaking to amend Indiana's WQS.**

**Mrs. Gorenichi,**

Please accept these brief public comments on behalf of the Hoosier Environmental Council (HEC) regarding the Water Quality Standards (WQS) and potential future rulemakings to amend Indiana's WQS.

**About HEC**

Founded in 1983 as an Indiana not-for-profit organization, Hoosier Environmental Council (HEC) works toward a healthy environment and sustainable economy for our state. Central to HEC's mission is its commitment to protecting and improving water quality across Indiana. Water is one of our most vital resources, essential for public health, economic development, and the preservation of Indiana's natural ecosystems.

As part of this commitment, HEC actively engages in efforts to strengthen Indiana's Water Quality Standards (WQS) to align with emerging scientific knowledge and federal guidelines. WQS serve as the foundation for protecting Indiana's water resources, establishing the benchmarks necessary to maintain and safeguard human health, restore the health of aquatic ecosystems, and ensure sustainable water use for current and future generations.

HEC's comments on potential future rulemakings to amend Indiana's WQS reflect this dedication by urging the Indiana Department of Environmental Management (IDEM) to:

1. Enhance human health protections by incorporating standards that account for vulnerable populations, such as children and communities dependent on untreated water sources.
2. Adopt the U.S. EPA's latest recommendations for contaminants like PFAS, including PFOA and PFOS, which are recognized for their severe and lasting impact on aquatic ecosystems and human health.
3. Strengthen protections for aquatic life by addressing new scientific findings on the sensitivity of Indiana's native species to pollutants and toxic substances.

4. Embrace adaptive management practices, which allow flexibility in responding to emerging contaminants and environmental changes while ensuring long-term environmental goals are met.

HEC believes that advancing Indiana's Water Quality Standards is not only a moral imperative to protect public health and biodiversity but also an economic opportunity to position Indiana as a leader in clean water technology and sustainable development. By submitting these comments, HEC underscores the need for precautionary measures to prevent irreversible environmental damage and for holding polluters accountable under the Polluter Pays Principle to ensure those responsible for contamination bear the costs of remediation.

Through these actions, HEC continues its legacy of advocating for strong environmental policies that protect Indiana's waters, strengthen communities, and foster a sustainable economy.

**Comments:**

**1)** Adopt numeric national recommended water quality criteria (NRWQC) for aluminum (2018). IDEM removed aluminum from the metals' rulemaking mentioned above (LSA Document #14-58), since the proposed aluminum criteria at the time was not consistent with EPA's 2018 NRWQC for aluminum. In addition, there are some implementation challenges related to adopting the 2018 criterion for aluminum. During the 2021 WQS review, IDEM decided that additional time and research was needed. Some of the challenges include: 1) How to properly assess Indiana waterbodies for bioavailable aluminum and 2) Obtaining enough ambient water quality data on one of the main input parameters for the 2018 aluminum criteria calculator - dissolved organic carbon (DOC). IDEM believes a separate rulemaking that focuses solely on adopting the aluminum criteria is appropriate.

a) **Support for Rulemaking Approach**

Hoosier Environmental Council (HEC) supports IDEM's decision to initiate a separate rulemaking process for adopting aluminum criteria. This approach allows for focused research and meaningful stakeholder engagement. Given aluminum's complex behavior in aquatic ecosystems, a targeted strategy can promote stronger, science-based decision-making. **However, HEC urges IDEM to establish a clear timeline with specific milestones to avoid indefinite delays that could threaten Indiana's water bodies and public health.**

HEC also calls on IDEM to apply the Precautionary Principle, a vital approach in environmental management that emphasizes proactive measures to protect human health and the environment, even in the presence of scientific uncertainty. This principle asserts that when there is evidence indicating potential harm to the environment or public health, action should be taken, even without complete scientific certainty (UN, 1992). This is particularly relevant for pollutants like aluminum, whose health and ecological effects may not yet be fully understood. By implementing a precautionary approach, IDEM can ensure that water quality protections remain strong while the scientific and regulatory processes continue to develop.

b) **Addressing Data Gaps**

IDEM recognizes the necessity of gathering more ambient water quality data, particularly concerning dissolved organic carbon (DOC), which is essential for understanding the bioavailability of aluminum. To address this need, a comprehensive monitoring program should be initiated to collect site-specific DOC data across various water bodies in Indiana. **HEC strongly encourages IDEM to prioritize this data collection and to explore partnerships with academic institutions, community science initiatives, or environmental NGOs to expand the program's reach and reduce costs.**

Regarding consistency with federal guidelines, IDEM's previous aluminum criteria were not aligned with the 2018 National Recommended Water Quality Criteria (NRWQC). While IDEM must adhere to EPA guidance, the agency should also evaluate whether site-specific criteria are necessary for individual water bodies in Indiana. Given Indiana's unique hydrological and ecological context, including its karst systems and agricultural landscapes, a one-size-fits-all approach may overlook significant factors. **HEC urges IDEM to consider implementing site-specific or regional water quality criteria (SSWQC) where appropriate.**

**2)** Adopt NRWQC for acrolein (2009), carbaryl (2012), diazinon (2005), nonylphenol (2005), and tributyltin (2004) for waters within and outside of the Great Lakes System. These pollutants are a mix of pesticides, biocides, and anti-fouling agents.

**a) HEC supports IDEM's proposal to adopt the NRWQC for acrolein, carbaryl, diazinon, nonylphenol, and tributyltin for waters within and outside the Great Lakes System.** These pollutants, which include pesticides, biocides, and anti-fouling agents, pose significant threats to aquatic ecosystems, human health, and Indiana's economic future. Aligning Indiana's water quality standards with the most up-to-date federal criteria is critical toward protecting the state's water resources. This action also aligns with key findings from the Indiana Chamber of Commerce's Water Study (Indiana Chamber Report), which emphasizes that Indiana's long-term economic growth depends on the availability and quality of water resources. By enhancing protections against hazardous pollutants, IDEM is ensuring that Indiana's water remains a competitive advantage for businesses and communities. This supports sustainable development and reduces the risk of costly remediation in the future.

**b) Precautionary Principle and Climate Resilience:** Given Indiana's changing precipitation patterns, as highlighted in the Indiana Climate Change Impacts Assessment (ICCIA), increased runoff from agricultural lands and stormwater surges could exacerbate the presence of these pollutants in Indiana's waterbodies. IDEM should apply the Precautionary Principle in its decision-making, ensuring that water quality protections are strong enough to account for climate-induced changes in pollutant transport and bioavailability. Implementing NRWQC now, rather than delaying, is a proactive approach that supports the long-term resilience of Indiana's water resources.

**3)** Update Indiana's procedures for calculating human health ambient WQC to reflect current U.S. EPA guidance and to implement consistent statewide procedures. These methodologies are used to derive ambient WQC for chemicals that do not have a NRWQC at Section 304(a) of the CWA but have the potential to impact human health. Updating these procedures will include adopting updated exposure, bioaccumulation, and toxicity factors that reflect the latest scientific information and U.S. EPA policies.

Hoosier Environmental Council congratulates IDEM's efforts to update its procedures for calculating human health ambient WQC to align with current U.S. EPA guidance. This update is essential for ensuring that Indiana's water quality standards are grounded in the latest science and provide robust protection for public health. Consistent, science-based methodologies are critical for assessing contaminants that do not have established NRWQC under Section 304(a) of the Clean Water Act (CWA).

This update also strengthens Indiana's ability to address emerging contaminants of concern, such as PFAS, pharmaceuticals, and personal care products, which may not yet have federal criteria but have significant health implications. Adopting updated exposure, bioaccumulation, and toxicity factors is a vital improvement. Human health risks from water contaminants depend on how much of the contaminant people are exposed to, how it accumulates in aquatic organisms (like fish), and how toxic it is. **HEC advises IDEM to take into consideration the following:**

**a. Exposure Factors:** The updated procedures should reflect modern water consumption habits, particularly the number of fish consumed by vulnerable populations, such as subsistence fishers, local communities, and pregnant women. Indiana should adopt more protective assumptions for fish consumption rates, similar to other Great Lakes states, to better protect these at-risk populations.

**b. Bioaccumulation Factors:** IDEM should ensure that bioaccumulation factors are appropriate for Indiana's diverse aquatic systems, as bioaccumulation can vary significantly by waterbody type and species (https://archive.epa.gov/water/archive/polwaste/web/pdf/bioaccum.pdf). Since Indiana has a range of aquatic environments (e.g., rivers, reservoirs, and lakes), the calculation methods should reflect site-specific conditions.

**c. Toxicity Factors:** The most up-to-date toxicity information should be incorporated to account for cumulative impacts of exposure to multiple contaminants. This is especially important for pollutants like PFAS, which have been linked to various health effects, including cancer, immune system damage, and developmental impacts on children.

One of the most critical aspects of this update is its application to emerging contaminants, such as PFAS (per- and polyfluoroalkyl substances), microplastics, and pharmaceuticals, which may not yet have NRWQC. Indiana can set a national precedent by addressing these "data-poor" contaminants through state-specific WQC methodologies. By incorporating precautionary principles and protective assumptions, IDEM can better manage risks from pollutants where data is still developing, but the public health risk is evident.

**The Precautionary Principle should be applied to protect Indiana's water users, especially considering findings from the Indiana Chamber of Commerce's Water Study, which underscores the economic importance of clean water for the state's future development and workforce health.**

Adopting consistent methodologies statewide benefits all stakeholders, including water utilities, industrial dischargers, and community members. Consistent and transparent procedures reduce regulatory uncertainty and clarify to industries, municipalities, and developers the standards they must meet to protect water quality. This also enhances IDEM's ability to track compliance and enforce permits more effectively.

**HEC recommends IDEM to ensure that procedures do not result in "one-size-fits-all" criteria that fail to address unique, site-specific risks.** For example, smaller, vulnerable waterbodies that support high levels of recreational fishing should have more protective criteria than large, industrialized rivers. A tiered or site-specific approach could ensure that water quality protections are more equitable and effective across Indiana's diverse waterbodies.

**4)** Update or adopt new and updated human health ambient WQC for 94 chemical pollutants that are NRWQC at Section 304(a) of the CWA. U.S. EPA derived the 94 human health ambient WQC using updated exposure, bioaccumulation, and toxicity factors that reflect the latest scientific information and U.S. EPA policies. This could include the adoption of U.S. EPA's 2015 updated exposure assumptions used to calculate human health criteria. IDEM is evaluating EPA's 2015 updates to their human health methodology, including the exposure assumptions.

HEC strongly supports IDEM's efforts to evaluate and potentially adopt updated human health ambient Water Quality Criteria (WQC) for 94 chemical pollutants as outlined by the U.S. EPA under Section 304(a) of the Clean Water Act (CWA). These updates represent a critical opportunity to protect public health, especially for vulnerable populations, and align Indiana's water quality standards with the latest scientific advancements. HEC commends IDEM for assessing the U.S. EPA's 2015 updates to human health methodologies, including exposure assumptions. However, **we urge IDEM to accelerate this process and adopt these updates promptly to ensure Indiana's waters are better protected**. **To do so, HEC urges the implementation of the following activities:**

**a. Adopt the Updated WQC Without Delay:** HEC urges IDEM to adopt the updated WQC for the 94 pollutants based on the U.S. EPA's 2015 methodology. These steps will enhance protections for communities dependent on Indiana's waterways for drinking water, recreation, and sustenance.

**b. Engage Stakeholders in Collaborative Discussions:** HEC recommends that IDEM convene a diverse stakeholder working group to promote transparency and inclusivity in this process. This group should include representatives from environmental organizations, public health experts, industry, community leaders, and other organized groups to foster understanding and build consensus.

**c. Enhance Monitoring and Enforcement: HEC strongly recommends that IDEM allocate additional resources to strengthen monitoring and enforcement mechanisms, ensuring that the updated WQC are effectively implemented**. Additionally, enforcement actions should follow the Polluters Pay Principle, which holds violators accountable for environmental remediation and damages (Tietenberg, 2006).

**d. Consider Indiana-Specific Data:** While the U.S. EPA's criteria provide a strong framework, HEC encourages IDEM to consider how Indiana-specific environmental and socio-economic factors might affect pollutant behavior and exposure risks. Incorporating local data into decision-making will ensure that the criteria are tailored to Indiana's unique conditions.

**e. Address Potential Industry Concerns: HEC suggests that IDEM proactively engage with industrial stakeholders to address concerns regarding compliance costs and operational impacts.** IDEM should highlight that improved water quality benefits businesses by enhancing ecosystem services, promoting healthier workforces, and strengthening community relationships.

**f. Promote Nature-Based Solutions: HEC recommends integrating nature-based solutions,** such as wetland restoration, riparian buffers, and floodplain reconnections, into compliance strategies. These cost-effective approaches can naturally reduce pollutant levels, complement regulatory efforts, and enhance the overall resilience of Indiana's water resources.

**g. Educate and Engage the Public: HEC urges IDEM to launch educational campaigns to inform the public about the significance of the updated WQC.** Transparent communication regarding the public health benefits, particularly for children and underserved communities, will help foster broader support and compliance.

**5)** Remove the limited use waters classification and waters classified for limited use in 327 IAC 2-1 and 327 IAC 2-1.5.

HEC views the proposed removal of the limited use waters classification and associated waters in 327 IAC 2-1 and 327 IAC 2-1.5 as a pivotal decision that demands careful consideration and proactive measures to ensure the long-term protection and restoration of Indiana's water resources. Removing this classification presents an opportunity to improve water quality standards across the state, enhance ecosystem health, and promote environmental justice.

Limited-use waters often permit lower water quality standards, which can result in environmental degradation, public health risks, and inequities in access to clean water. Removing this classification could help address these issues, aligning with broader environmental and social goals. For this, HEC presents the following analysis:

a. **Strengthening Water Quality Standards:** it's important to address the issues related to the classification of limited-use waters. This classification often allows for pollution and other detrimental effects on water bodies, which can lead to the degradation of aquatic ecosystems. Scientific studies indicate that maintaining high water quality standards is vital for preserving biodiversity, ensuring ecosystem health, and protecting public health. According to the U.S. EPA, impaired waters lead to reduced biodiversity, habitat loss, and a decline in the quality of recreational and drinking water resources (EPA, 2020). Removing the limited use classification aligns with efforts to raise water quality standards and can help reduce the significant health risks of contaminated water, including the spread of waterborne diseases.

**b. Water Flows—and So Does Pollution**: It is essential to acknowledge the interconnectedness of water systems. Water bodies, especially those classified for limited use, are often connected to larger watersheds. Pollution in one area can quickly flow downstream, affecting other water bodies and ecosystems. Research indicates that pollutants in surface waters, including heavy metals, nutrients, and pathogens, can travel long distances, impacting water quality and biodiversity far beyond their source (Dodds et al., 2009). By eliminating the limited-use classification, IDEM can help mitigate the flow of pollutants into other, more vulnerable water systems, improving the overall quality of Indiana's water resources.

**c. Equity and Environmental Justice Concerns:** Limited access to water disproportionately affects disadvantaged communities that rely on these resources for drinking, recreation, and irrigation. According to the National Environmental Justice Advisory Council (NEJAC), marginalized communities often live near polluted water sources and suffer the most from the impacts of water contamination (NEJAC, 2016). These communities typically have less access to the resources necessary to address water pollution, which exacerbates existing inequalities. Removing the limited use classification is a step toward ensuring that all Indiana residents benefit from clean and safe water, regardless of their location or socio-economic status.

**d. Alignment with Precautionary and Polluters Pay Principles:** Retaining the limited-use waters classification undermines the Precautionary Principle, which calls for preventive action in uncertainty. By maintaining lower water quality standards for specific waters, IDEM allows potential harm to continue without fully addressing the long-term risks to public health and ecosystems. The Polluters Pay Principle also supports the removal of the limited-use waters classification, ensuring that industries and other entities responsible for water degradation bear the financial and operational costs of restoration and compliance (Tietenberg, 2006).

Eliminating lower water quality classifications aligns with the principles of the CWA and the overarching goal of protecting public health and aquatic ecosystems. By minimizing exposure to contaminants, safeguarding biodiversity, and improving the management of pollutant discharges, this approach promotes cleaner and healthier water systems. Stricter water quality standards improve ecosystem services and long-term sustainability, benefiting human populations and the environment.

**(6)** Update current Indiana WQS variance rules to include a 2015 U.S. EPA rule (40 CFR 131.14) that establishes a regulatory framework for the adoption of WQS variances to implement adaptive management approaches to improve water quality.

HEC strongly urges the IDEM to update the current Water Quality Standards (WQS) variance rules to incorporate the 2015 U.S. EPA rule (40 CFR 131.14), establishing a regulatory framework for adopting WQS variances to implement adaptive management approaches. This update presents a scientifically based and flexible solution to the water quality challenges facing Indiana. HEC believes that this approach is essential for safeguarding the health of our water sources and communities. Below are HEC's detailed suggestions, claims, and requirements for IDEM's consideration:

**a. HEC encourages IDEM to implement adaptive management practices to enhance water quality.** HEC strongly urges IDEM to incorporate adaptive management principles into Indiana's WQS variance rules. Adaptive management, which allows for flexible, data-driven decision-making in response to evolving water quality conditions, has been proven effective in addressing complex water quality issues, including nutrient pollution and sedimentation (https://www.iwmi.org/Publications/IWMI_Research_Reports/PDF/PUB110/RR110.pdf). By adopting this approach, IDEM can better manage Indiana's waterbodies, especially those affected by eutrophication, hypoxic zones, and harmful algal blooms.

b. **HEC recommends that IDEM focus on solutions specific to Indiana's water quality issues, including agricultural runoff and urban stormwater management.** Indiana's rivers, lakes, and streams are subject to different pressures based on local land use, and adopting a more regionally specific approach will lead to more effective and sustainable water quality improvements. Scientific evidence supports that flexible, site-specific strategies are crucial for managing nutrient loads and improving the overall health of water ecosystems https://www.iwmi.org/Publications/IWMI_Research_Reports/PDF/PUB110/RR110.pdf IDEM must focus on local solutions, particularly where nutrient pollution and water quality issues are most pressing.

c. **HEC claims that regular data collection and monitoring are essential:**
HEC claims that regular and transparent data collection and monitoring should be at the core of any adaptive management approach. To ensure the effectiveness of adaptive management, IDEM must prioritize establishing a robust monitoring system that can evaluate water quality and measure the success of implemented strategies. Studies have shown that consistent, real-time monitoring is essential for successful adaptive management, as it allows for timely adjustments and evidence-based decision-making (Chesapeake Bay Program, 2019) https://www.chesapeakebay.net/who/group/scientific-and-technical-analysis-and-reporting.

Therefore, IDEM must invest in enhanced monitoring efforts to support adaptive management practices.

c. **HEC requires IDEM to ensure accountability and environmental justice:**

HEC requires IDEM to ensure that any water quality standards (WQS) variances granted under adaptive management principles include strong accountability mechanisms. Variances must not be used to relax water quality standards or postpone necessary improvements. IDEM must establish clear and enforceable timelines along with performance metrics to achieve water quality goals. **Furthermore, HEC emphasizes the need to apply adaptive management with an equity perspective, ensuring that these approaches do not disproportionately impact marginalized or underserved communities**. Vulnerable communities, especially those who rely on these water resources for drinking water or recreation, must be protected from additional pollution burdens (Bullard, 2000). IDEM should ensure that adaptive management strategies are applied equitably without undermining the health and well-being of disadvantaged populations.

e. **HEC Urges IDEM to integrate scientific data and public engagement:**
HEC encourages IDEM to incorporate scientific data and public engagement into the adaptive management process. Transparency is essential for building public trust and ensuring effective efforts to improve water quality. IDEM should involve stakeholders, including local communities, environmental organizations, and industries, in the development of adaptive management strategies. Collaborative decision-making has led to better environmental outcomes and more widely supported policies (Miller et al., 2012). IDEM should ensure that the latest scientific data inform these strategies and that there is a straightforward, inclusive process for public input and feedback.

f. **HEC Requires IDEM to uphold long-term environmental goals:**
While adaptive management provides flexibility, **HEC requires that IDEM prioritize long-term environmental goals.** Pollutants such as nitrogen, phosphorus, and mercury have been shown to have detrimental effects on aquatic ecosystems and public health (Smith et al., 2016). IDEM must ensure that adaptive management does not delay or weaken the regulatory measures needed to reduce these pollutants. **HEC claims that IDEM must uphold the spirit of the CWA by ensuring that any variances granted through adaptive management are ultimately aimed at improving water quality in a measurable, timely manner and that safeguards are in place to prevent regulatory loopholes.**

**6)** U.S. EPA published NRWQC at Section 304(a) of the CWA for perfluorooctanoic acid (PFOA) and for perfluorooctane sulfonate (PFOS) for the protection of aquatic life (September 2024). U.S. EPA has not published other NRWQC for the protection of aquatic life or human health since IDEM's 2021 WQS Review. IDEM is anticipating EPA to publish draft human health NRWQC for several PFAS compounds in the near future. IDEM will evaluate EPA's PFAS related criteria recommendations as they are finalized.

**HEC emphasizes the urgency of addressing per- and polyfluoroalkyl substances (PFAS) contamination in Indiana's water bodies.** The recent publication of the National Recommended Water Quality Criteria (NRWQC) by the U.S. EPA for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS), specifically for the protection of aquatic life, represents an important step in mitigating the harmful effects of these forever pollutants. However, HEC urges IDEM to act proactively and implement additional measures to address PFAS contamination and to integrate these new guidelines into Indiana's WQS as soon as possible.

a. **HEC urges IDEM to Adopt U.S. EPA's NRWQC for PFOA and PFOS:**
   **HEC strongly urges IDEM to swiftly incorporate the U.S. EPA's NRWQC for PFOA and PFOS into Indiana's Water Quality Standards.** PFOA and PFOS are two of the most well-known PFAS compounds, widely found in industrial processes and firefighting foams, and are known to pose significant risks to aquatic life and human health. The precautionary principle suggests that in situations where there is a potential threat to human health or the environment, even in the face of scientific uncertainty, precautionary actions should be taken to prevent harm. Scientific studies have shown that PFAS contamination in aquatic ecosystems leads to significant long-term ecological impacts, including bioaccumulation in aquatic organisms (Schwarzbauer et al., 2015), and disruption to reproductive systems in fish species (Choi et al., 2021). Given the persistence and mobility of PFAS in the environment, IDEM should immediately integrate these new criteria to protect the health of Indiana's citizens and aquatic life.

b. **HEC requires comprehensive action on emerging PFAS compounds:**
   **HEC requires IDEM to expand its focus beyond just PFOA and PFOS.** While the U.S. EPA's 2024 publication on NRWQC for these two compounds is an important step, IDEM must be proactive in considering other PFAS compounds that pose similar risks to human health and aquatic ecosystems. There are hundreds of PFAS chemicals with potential to impact water quality and biodiversity, and the scientific community continues to identify new risks associated with these chemicals. **IDEM should enforce stricter regulations, including requiring regular monitoring and clean-up of PFAS contamination in the state's waters, and ensure that companies responsible for the contamination pay for the cleanup and mitigation efforts.**

a. **HEC suggests IDEM prioritize public health and aquatic ecosystem protection:**
   **HEC suggests that IDEM not only adopt the U.S. EPA's NRWQC but also prioritize public health considerations in its decision-making.** PFAS compounds are known to cause a range of adverse health effects in humans, including cancer, liver damage, developmental harm, and immune system disruptionhttps://dceg.cancer.gov/research/what-we-study/pfas#:~:text=PFAS%20are%20a%20component%20of,and%20other%20highly%20exposed%20populations. Moreover, the bioaccumulation of PFAS in fish and wildlife can impact biodiversity, leading to long-term ecological harm. IDEM must take a holistic approach that includes strict monitoring and treatment of PFAS in drinking water, as well as consideration of PFAS contamination across all water bodies.

Studies have shown that even at low concentrations, PFAS can pose significant risks to both human health and the environment (National Research Council, 2009) https://nap.nationalacademies.org/read/26156/chapter/2.By applying the **precautionary principle**, IDEM can prevent irreversible damage to both public health and aquatic ecosystems.

In conclusion, HEC strongly urges IDEM to take swift action to incorporate the **U.S. EPA's NRWQC for PFOA and PFOS** into Indiana's Water Quality Standards. In addition, IDEM must expand its focus to include emerging PFAS compounds, apply the **precautionary principle**, and ensure the **polluter pays** for contamination and cleanup efforts. Through proactive monitoring, stringent regulation, and robust public health protections, Indiana can protect its aquatic ecosystems and communities from the lasting impacts of PFAS contamination. It is imperative that IDEM leads the charge in safeguarding Indiana's waters for current and future generations.

**Dr. Maria Iturbide-Chang, PhD**
**Water Policy Director**

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**PFAS Science-based articles:**


- https://www.sciencedirect.com/science/article/pii/S2667010024000271#:~:text=Presence%20of%20PFAS%20in%20coastal,Ahrens%20and%20Bundschuh%2C%202014)
- https://www.sciencedirect.com/science/article/abs/pii/S0048969722006532#:~:text=Higher%20trophic%20level%20organisms%2C%20like,accumulate%20rates%2C%20and%20environmental%20factors

# Appendix G

# Indiana's Nutrient Criteria Development Milestones for FY25

| | | | | |
|---|---|---|---|---|
| **Nutrient Criteria Development Milestones for FY25:** *INDIANA* | | | | Date: 08/01/2024<br>Completed By: Gabby Ghreichi and Martha Clark Mettler |
| **Total Phosphorus** | | | | |
| Milestone | | Target date | Completion date | Comments |
| **Lakes & Reservoirs** | Planning for criteria development | *completed* | *completed* | |
| | Collection of information & data | *completed* | *completed* | |
| | Analysis of information & data | *completed* | *July 2010* | |
| | Proposal of criteria | | | **IDEM has evaluated EPA HQ's statistical models included in the 2021 Ambient Water Quality Criteria to Address Nutrient Pollution in Lakes and Reservoirs (NRWQC) as well as the Technical Support Document for the 2021 nutrient lake criteria. The models can be used to derive Indiana-specific chlorophyll a, TN and/or TP values that will protect a specific designated use (aquatic life, recreation, drinking water). EPA developed, as part of a pilot project for the 2021 NRWQC, an Indiana-specific chlorophyll a-microcystin model for the recreation designated use at certain lakes and reservoirs. IDEM found that the model is not a good fit given Indiana's current lake datasets. IDEM is evaluating whether additional lake data from the Corps of Engineers may be used to derive a nutrient model and resulting criteria for a sub-set of Indiana lakes, such as our reservoirs, to protect the recreation and/or drinking water designated use.* |

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|---|---|---|---|---|
| | | | | *IDEM may evaluate the feasibility of implementing other models that may be more appropriate for protecting designated uses at other lakes and reservoirs, and whether additional data collection is needed to verify and implement the selected models. IDEM participated in an EPA Region 5 RTAG NSTEPS grant that will develop a set of regional variables, such as dissolved organic carbon and threshold slope, needed for certain models. IDEM is waiting for the final report on this Region 5 analysis to be released in order to review the findings.* |
| | Adoption of criteria into the state's WQS | | | *IDEM is reviewing whether to apply for N-STEPS assistance with further evaluating the NRWQC models with additional Corps of Engineers reservoir data.* |
| **Rivers & Streams** | Planning for criteria development | *completed* | *completed* | |
| | Collection of information & data | *2017 Nutrient Pilot study completed*<br>Summer 2024 for 2024 N-STEPS project | Ongoing | See notes below. |
| | Analysis of information & data | *TBD* | *TBD* | IDEM is currently working with EPA through an N-STEPS project to analyze additional data collected during 2018-2021 that includes dissolved reactive phosphorus (DRP), continuous dissolved oxygen, fish, macroinvertebrate, diatom, and habitat data. This analysis will supplement the original 2017 pilot study in |

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| | | | order to detect meaningful relationships between nutrients, related variables, and aquatic life in streams. Breakpoint analysis could help determine if there are DRP concentrations that noticeably impact the biology. IDEM would also like to determine if the DO flux regime has significant impacts on the biology. This project will help inform IDEM's assessment methodology for nutrients in Indiana's streams and rivers. |
| Collection of data for pilot technical study | *May-September 2017* | *Completed* | *The data collection, completed September 2017, included continuous DO and other parameters. IDEM evaluated the data to determine if DO is a critical parameter for a multi-variable criterion.* |
| | *2024 Nutrient Data Project* | 2024 Nutrient Data Project Completion Date TBD | 2024 Collection of water chemistry and biology data ongoing (diatoms are included along with fish and macro data). |
| QA/QC of data, biological community IDs | *2018* | *completed* | |
| Analysis of data | *2019* | *2019 study completed;* | *IDEM published the draft report on September 30, 2019, and the final report on January 17, 2020.* |
| | | *Nutrient Data Study TBD* | |

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| | | 2023-2024 (N-STEPS project in progress) | | IDEM is hoping to see results of a 2023-2024 nutrient data analysis project by the end of 2024 or by early 2025. |
| | Proposal of criteria | ** | ** | *** Additional data is needed to fully understand the nuances of nutrient utilization in the lotic aquatic system and all the factors influencing whether a given concentration of nutrient is beneficial or harmful. IDEM will evaluate analysis and recommendations from the 2024 nutrient N-STEPS data study to see if there are any necessary updates needed to IDEM's nutrient 303(d) assessment methods. In addition, IDEM will consider whether the final report identifies any future nutrient criteria avenues of research.* |
| | Adoption of criteria into the state's WQS | *** | | ***In addition to requiring additional data and information about the complex relationship between nutrients and other variables in lotic systems, IDEM is continuing to evaluate whether Indiana's Diatom Index can be further analyzed in order to facilitate the development of a total phosphorus criterion for rivers and streams. IDEM is currently participating in Region 5 discussions on whether a regional diatom index could be created.* |

**Total Nitrogen**

| Milestone | | Target date | Completion date | Comments |
|---|---|---|---|---|
| | Planning for criteria development | *completed* | *completed* | |
| | Collection of information & data | *completed* | *completed* | |

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| **Lakes & Reservoirs** | Analysis of information & data | * | | **IDEM has evaluated EPA HQ's statistical models included in the 2021 Ambient Water Quality Criteria to Address Nutrient Pollution in Lakes and Reservoirs (NRWQC). The models can be used to derive Indiana-specific chlorophyll a, TN and/or TP values that will protect a specific designated use (aquatic life, recreation, drinking water). EPA developed, as part of a pilot project for the 2021 NRWQC, an Indiana-specific chlorophyll a-microcystin model for the recreation designated use at certain lakes and reservoirs. IDEM will evaluate the feasibility of implementing other models that may be more appropriate for protecting designated uses at other lakes and reservoirs, and whether additional data collection is needed to verify and implement the selected models. IDEM is participating in an EPA Region 5 RTAG NSTEPS grant that will develop a set of regional variables, such as dissolved organic carbon and threshold slope, needed for certain models. IDEM is still waiting for the publication of the final report associated with this project.* |
| | Proposal of criteria | ** | | ***To be evaluated following review and analysis of the NRWQC models and EPA's Indiana state-specific chlorophyll a-microcystin model. IDEM is reviewing whether to apply for N-STEPS assistance with further evaluating of the NRWQC models with additional Corps of Engineers reservoir data.* |
| | Adoption of criteria into the state's WQS | - | - | |

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| **Rivers & Streams** | Planning for criteria development | *completed* | *completed* | |
| | Collection of information & data | *completed* | *completed* | |
| | Analysis of information & data | *Oct. 2012* | *completed* | |
| | Collection of data for pilot technical study | *May-September 2017* | *completed* | *The study, completed September 2017, included continuous DO and other parameters to fill data gaps in existing data set.* |
| | QA/QC of data, biological community IDs | *2018* | *completed* | |
| | Analysis of data | *2019* | *completed* | *IDEM published the draft report on September 30, 2019, and the final report on January 17, 2020.* |
| | Proposal of criteria | ** | | *** Additional data is needed to fully understand the nuances of nutrient utilization in these aquatic systems and all the factors influencing whether a given concentration of nutrient is beneficial or harmful.* |
| | Adoption of criteria into the state's WQS | *** | | *****In addition to the need for additional data, IDEM will evaluate in 2025 the monthly TN data collected from all major POTW's over the past 5-year permit cycle well as TN data available for rivers/streams in Indiana, to characterize TN ambient levels in Indiana rivers/streams as well as TN levels being discharged from major municipal dischargers.* |