Minnesota

State Register

(Published every Monday (Tuesday when Monday is a holiday.)

**Proposed, Adopted, Emergency, Expedited, Withdrawn, Vetoed Rules;
Executive Orders; Appointments; Commissioners' Orders; Revenue Notices;
Official Notices; State Grants & Loans; State Contracts;
Non-State Public Bids, Contracts &Grants**

Monday 16 June 2014

Volume 38, Number 51

Pages 1629 - 1672

Minnesota State Register

Judicial Notice Shall Be Taken of Material Published in the *Minnesota State Register*

The *Minnesota State Register* is the official publication of the State of Minnesota's Executive Branch of government, published weekly to fulfill the legislative mandate set forth in *Minnesota Statutes*, Chapter 14, and *Minnesota Rules*, Chapter 1400. It contains:

- **Proposed Rules**
- **Adopted Rules**
- **Exempt Rules**
- **Expedited Rules**
- **Withdrawn Rules**
- **Vetoed Rules**
- **Executive Orders of the Governor**
- **Appointments**
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- **Commissioners' Orders**
- **Revenue Notices**
- **Official Notices**
- **State Grants and Loans**
- **Contracts for Professional, Technical and Consulting Services**
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Printing Schedule and Submission Deadlines

Vol. 38 Issue Number	PUBLISH DATE (**BOLDFACE** shows altered publish date)	Deadline for: all Short Rules, Executive and Commissioner's Orders, Revenue and Official Notices, State Grants, Professional-Technical-Consulting Contracts, Non-State Bids and Public Contracts	Deadline for LONG, Complicated Rules (contact the editor to negotiate a deadline)
# 52	Monday 23 June	Noon Tuesday 17 June	Noon Thursday 12 June
# 53	Monday 30 June	Noon Tuesday 24 June	Noon Thursday 19 June
Vol. 39, # 1 -	Monday 7 July (FY-15)	Noon Tuesday 1 July (FY-15)	Noon Thursday 26 June
# 2	Monday 14 July	Noon Tuesday 8 July	Noon Thursday 3 July (FY-15)

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USPS Publication Number: 326-630 (ISSN: 0146-7751)

THE *MINNESOTA STATE REGISTER* IS PUBLISHED by Plant Management Division, Department of Administration, State of Minnesota, pursuant to *Minnesota Statutes* § 14.46 and is available on-line at website: *http://www.comm.media.state.mn.us/bookstore/mnbookstore*

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Minnesota Rules: Amendments and Additions

NOTICE: How to Follow State Agency Rulemaking in the State Register

The *State Register* is the official source, and only complete listing, for all state agency rulemaking in its various stages. State agencies are required to publish notice of their rulemaking action in the *State Register*. Published every Monday, the *State Register* makes it easy to follow and participate in the important rulemaking process. Approximately 80 state agencies have the authority to issue rules. Each agency is assigned specific **Minnesota Rule** chapter numbers. Every odd-numbered year the **Minnesota Rules** are published. Supplements are published to update this set of rules. Generally speaking, proposed and adopted exempt rules do not appear in this set because of their short-term nature, but are published in the *State Register*.

An agency must first solicit **Comments on Planned Rules** or **Comments on Planned Rule Amendments** from the public on the subject matter of a possible rulemaking proposal under active consideration within the agency (*Minnesota Statutes* §§ 14.101). It does this by publishing a notice in the *State Register* at least 60 days before publication of a notice to adopt or a notice of hearing, or within 60 days of the effective date of any new statutory grant of required rulemaking.

When rules are first drafted, state agencies publish them as **Proposed Rules,** along with a notice of hearing, or a notice of intent to adopt rules without a hearing in the case of noncontroversial rules. This notice asks for comment on the rules as proposed. Proposed emergency rules, and withdrawn proposed rules, are also published in the *State Register*. After proposed rules have gone through the comment period, and have been rewritten into their final form, they again appear in the *State Register* as **Adopted Rules.** These final adopted rules are not printed in their entirety, but only the changes made since their publication as Proposed Rules. To see the full rule, as adopted and in effect, a person simply needs two issues of the *State Register*, the issue the rule appeared in as proposed, and later as adopted.

The *State Register* features partial and cumulative listings of rules in this section on the following schedule: issues #1-13 inclusive; issues #14-25 inclusive (issue #26 cumulative for issues #1-26); issues #27-38 inclusive (issue #39, cumulative for issues #1-39); issues #40-52 inclusive, with final index (#1-52, or 53 in some years). An annual subject matter index for rules was separately printed usually in August, but starting with Volume 19 now appears in the final issue of each volume. For copies or subscriptions to the *State Register,* contact Minnesota's Bookstore, 660 Olive Street (one block east of I-35E and one block north of University Ave), St. Paul, MN 55155, phone: (612) 297-3000, or toll-free 1-800-657-3757. TTY relay service phone number: (800) 627-3529

Volume 38 - Minnesota Rules

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Pollution Control Agency (MPCA)

Commerce Department

Gambling Control Board

Secretary of State

Teaching Board

Proposed Rules

Comments on Planned Rules or Rule Amendments. An agency must first solicit Comments on Planned Rules or Comments on Planned Rule Amendments from the public on the subject matter of a possible rulemaking proposal under active consideration within the agency (*Minnesota Statutes* §§ 14.101). It does this by publishing a notice in the *State Register* at least 60 days before publication of a notice to adopt or a notice of hearing, and within 60 days of the effective date of any new statutory grant of required rulemaking.

Rules to be Adopted After a Hearing. After receiving comments and deciding to hold a public hearing on the rule, an agency drafts its rule. It then publishes its rules with a notice of hearing. All persons wishing to make a statement must register at the hearing. Anyone who wishes to submit written comments may do so at the hearing, or within five working days of the close of the hearing. Administrative law judges may, during the hearing, extend the period for receiving comments up to 20 calendar days. For five business days after the submission period the agency and interested persons may respond to any new information submitted during the written submission period and the record then is closed. The administrative law judge prepares a report within 30 days, stating findings of fact, conclusions and recommendations. After receiving the report, the agency decides whether to adopt, withdraw or modify the proposed rule based on consideration of the comments made during the rule hearing procedure and the report of the administrative law judge. The agency must wait five days after receiving the report before taking any action.

Rules to be Adopted Without a Hearing. Pursuant to *Minnesota Statutes* § 14.22, an agency may propose to adopt, amend, suspend or repeal rules without first holding a public hearing. An agency must first solicit **Comments on Planned Rules** or **Comments on Planned Rule Amendments** from the public. The agency then publishes a notice of intent to adopt rules without a public hearing, together with the proposed rules, in the *State Register*. If, during the 30-day comment period, 25 or more persons submit to the agency a written request for a hearing of the proposed rules, the agency must proceed under the provisions of §§ 14.14-14.20, which state that if an agency decides to hold a public hearing, it must publish a notice of intent in the *State Register*.

KEY: Proposed Rules - Underlining indicates additions to existing rule language. ~~Strikeouts~~ indicate deletions from existing rule language. If a proposed rule is totally new, it is designated "all new material." **Adopted Rules** - Underlining indicates additions to proposed rule language. ~~Strikeout~~ indicates deletions from proposed rule language.

Minnesota Pollution Control Agency (MPCA)

Environmental Assessment and Outcomes Division

Proposed Permanent Rules Relating to Human Health Methods for Water Quality

NOTICE OF INTENT TO ADOPT RULES WITHOUT A PUBLIC HEARING

Proposed Amendment of Rules Governing Water Quality Standards (Human Health Methods and BEACH Act) *Minnesota Rules*, 7050.0150, 7050.0217, 7050.0218, 7050.0219, 7050.0222, 7052.0005, 7052.0010, 7052.0100, 7052.0110, 7052.0220, and 7052.0230; Revisor's ID Number 4177

Introduction. The Pollution Control Agency (MPCA) intends to adopt rules without a public hearing following the procedures in the rules of the Office of Administrative Hearings, *Minnesota Rules*, parts 1400.2300 to 1400.2310, and the Administrative Procedure Act, *Minnesota Statutes*, §§ 14.22 to 14.28. You may submit written comments on the proposed rules and may also submit a written request that a hearing be held on the rules until September 4, 2014. Because of the detailed materials available on this rulemaking, the MPCA is holding an extended, 80-day comment period to ensure ample time for interested parties to review the proposal and contact the MPCA with questions.

MPCA Contact Person. You must submit comments or questions on the rules and written requests for a public hearing to the MPCA contact person. The contact person is Katie Izzo, MPCA–RMAD, 520 Lafayette Road North, St. Paul, Minnesota 55155-4194; **phone:** (651) 757-2595 or 1-800-657-3864; **e-mail:** ***minnrule7050.pca@state.mn.us***. **TTY** users may call the MPCA at (651) 282-5332.

Subject of Rules and Statutory Authority. The MPCA is proposing changes to rules governing the water quality standards (WQS) in *Minnesota Rules*, chapters. 7050 (Water Quality Standards for Protection of Waters of the State) and 7052 (Lake Superior Basin Water Standards). The proposed amendments will update the methods used for calculating the standards that specifically protect human health and will be used to make future revisions to the standards. The amendments will make the MPCA's methods more similar to the methods used by the Minnesota Department of Health and U.S. Environmental Protection Agency (EPA) guidance. The updates include:

- addition of more appropriate intake rates and early life-stage protections for infants and children
- evaluation of acute to long-term adverse effects and toxicological values
- inclusion of new approaches for assessing chemical break-down products and mixtures
- implementation of new methods for WQS applicable in fish tissue to better address bioaccumulative chemicals

The amendments also clarify how *E.coli* numeric WQS, already established under the federal Beaches Environmental Assessment and Coastal Health (BEACH) Act, apply in Lake Superior.

The statutory authority to adopt the rules is *Minnesota Statutes* §§ 115.03, subds. 1(b) and 1(c) and 115.44, subds 2 and 4. A copy of the proposed rules is published in the *State Register* and posted on the MPCA's website at ***http://www.pca.state.mn.us/chdfaa8***.

Comments. You have until 4:30 p.m. on September 4, 2014, to submit written comment in support of or in opposition to the proposed rules and any part or subpart of the rules. Your comment must be in writing and the contact person must receive it by the due date. The MPCA encourages your comment. Your comment should identify the portion of the proposed rules addressed and the reason for the comment. You are encouraged to propose any change desired. You must also make any comment about the legality of the proposed rules during this comment period. All comments received will be part of the rulemaking record and will be reviewed by the Office of Administrative Hearings.

Request for a Hearing. In addition to submitting comments, you may also request that the MPCA hold a hearing on the rules. Your request must be in writing and the MPCA contact person must receive it by 4:30 p.m. on September 4, 2014. Your written request for a public hearing must:

- include your name and address
- identify the portion of the proposed rules that you object to or state that you oppose the entire set of rules

Any request that does not comply with these requirements is not valid, and the MPCA cannot count it when determining whether the agency must hold a public hearing. You are encouraged to state the reason for the request and any changes you want made to the proposed rules.

Withdrawal of Requests. If 25 or more parties submit a valid written request for a hearing, the MPCA will choose to seek the withdrawal of those requests, hold a hearing, or withdraw the rulemaking. If a sufficient number withdraw their requests in writing to reduce the number below 25, the MPCA must give written notice of this to all parties who requested a hearing, explain the actions the MPCA took to effect the withdrawal, and ask for written comments on this action. If a public hearing is held the MPCA will follow the procedures in *Minnesota Statutes*, §§ 14.131 to 14.20.

Alternative Format. Upon request, this information can be made available in an alternative format, such as large print, braille, or audio. To make such a request, please contact the contact person at the address or telephone number listed above.

Modifications. The MPCA may modify the proposed rules as a result of public comment. The modifications must be supported by comments and information submitted to the MPCA, and the adopted rules may not be substantially different than these proposed rules, unless the MPCA follows the procedure under *Minnesota Rules*, part 1400.2110. If the proposed rules affect you in any way, the MPCA encourages you to participate in the rulemaking process.

Statement of Need and Reasonableness. The statement of need and reasonableness contains a summary of the justification for the proposed rules, including a description of who will be affected by the proposed rules and an estimate of the probable cost of the proposed rules. It is available for viewing at ***http://www.pca.state.mn.us/chdfaa8***. You may obtain copies from the MPCA contact person.

Lobbyist Registration. *Minnesota Statutes*, chapter 10A, requires each lobbyist to register with the State Campaign Finance and Public Disclosure Board. You should direct questions about this requirement to the Campaign Finance and Public Disclosure Board at: Suite 190, Centennial Building, 658 Cedar Street, St. Paul, Minnesota 55155, telephone: (651) 296-5148 or 1-800-657-3889.

Adoption and Review of Rules. If no hearing is required, the MPCA may adopt the rules after the end of the comment period. The MPCA will then submit the rules and supporting documents to the Office of Administrative Hearings for review for legality. You may ask to be notified of the date the MPCA submits the rules to the office. If you want to be so notified, or want to receive a copy of the adopted rule, submit your request to the MPCA contact person listed above. To register to receive notice of future rule proceedings, register at ***http://public.govdelivery.com/accounts/MNPCA/subscriber/new***.

Dated: 2 June 2014

John Linc Stine, Commissioner
Minnesota Pollution Control Agency

7050.0150 DETERMINATION OF WATER QUALITY, BIOLOGICAL AND PHYSICAL CONDITIONS, AND COMPLIANCE WITH STANDARDS.

[For text of subps 1 to 6, see M.R.]

Subp. 7. **Impairment of waters relating to fish for human consumption.**

A. In evaluating whether the narrative standards in subpart 3, which prevent harmful pesticide or other toxic pollutant residues in aquatic flora or fauna, are being met, the commissioner ~~will~~ must use the methods in:

(1) parts 7050.0218 and 7050.0219 for site-specific fish tissue-based chronic criterion (CC_{ft}); or

(2) parts 7050.0222 and 7052.0100 for fish tissue-based chronic standard (CS_{ft}).

B. If CS_{ft} has not been established for a pollutant with chronic standards (CS) applicable in water (CS_{dft}, CS_{dev}, or CS_{fr}), the residue levels in fish muscle tissue established by the Minnesota Department of Health must be used to identify surface waters supporting fish for which the Minnesota Department of Health recommends a reduced frequency of fish consumption for the protection of public health. A water body will be considered impaired when the recommended consumption frequency is less than one meal per week, such as one meal per month, for any member of the population. That is, a water body will not be considered impaired if the recommended consumption frequency is one meal per week, or any less restrictive recommendation such as two meals per week, for all members of the population. The impaired condition must be supported with measured data on the contaminant levels in the ~~indigenous~~ resident fish.

C. When making impairment determinations in an individual water body for a pollutant with both a fish tissue-based CC_{ft} or CS_{ft} and a CS applicable in water, comparison of fish tissue data to the CC_{ft} or CS_{ft} must be the basis for the final impairment determination.

[For text of subp 8, see M.R.]

7050.0217 OBJECTIVES FOR PROTECTION OF SURFACE WATERS FROM TOXIC POLLUTANTS.

Subpart 1. **Purpose and applicability.** The purpose of this part ~~and part 7050.0218~~ is to establish ~~methods~~ the objectives for developing numeric water quality standards listed in parts 7050.0220, 7050.0222, 7050.0227, and 7052.0100 and site-specific water quality criteria for toxic pollutants or chemicals developed in the absence of numeric standards ~~listed in parts 7050.0220, 7050.0222, and 7050.0227~~. The listed numeric standards for toxics and site-specific numeric criteria established by ~~these~~ methods in parts 7050.0218 and 7050.0219 protect Class 2 waters for the propagation and maintenance of fish and aquatic life, the consumption of fish and edible aquatic life by humans, the use of surface waters for public and private domestic consumption where applicable, and the consumption of aquatic organisms by wildlife. These criteria also protect the uses assigned to Class 7, limited resource value, waters as described in parts 7050.0140 and 7050.0227.

Subp. 2. **Objectives.**

A. Protection of the aquatic community from the toxic effects of pollutants means the protection of no less than 95 percent of all the species in any aquatic community. Greater protection may be applied to a community if economically, recreationally, or ecologically important species are very sensitive.

B. Protection of human consumers of fish, other edible aquatic organisms, and water for drinking from surface waters means that exposure from noncarcinogenic chemicals ~~shall~~, including nonlinear carcinogens (NLC), singly or in mixtures, must be below levels expected to produce known adverse effects; the combined risk from mixtures of noncarcinogens and NLC must not exceed the common health risk index endpoints or health endpoints described in part 7050.0222, subpart 7, item D; and the incremental cancer risk from exposure to carcinogenic chemicals, singly or in mixtures, ~~shall~~ must not exceed one in 100,000. The combined risk from mixtures of linear carcinogens (C) will be determined as described in part 7050.0222, subpart 7, item ~~D~~ E.

C. Protection of wildlife that eat aquatic organisms means the protection of the most sensitive wildlife species or populations. Greater protection may be applied if the exposed animals include endangered or threatened wildlife species listed in chapter 6134, or in *Code of Federal Regulations*, title 50, part 17, under the Endangered Species Act of 1973, *United States Code*, title 16, sections 1531 to 1543.

7050.0218 FOR TOXIC POLLUTANTS: DEFINITIONS AND METHODS FOR DETERMINATION OF ~~CRITERIA FOR TOXIC POLLUTANTS, FOR WHICH~~ HUMAN HEALTH-BASED NUMERIC STANDARDS ~~NOT PROMULGATED~~ AND SITE-SPECIFIC NUMERIC CRITERIA FOR AQUATIC LIFE, HUMAN HEALTH, AND FISH-EATING WILDLIFE.

Subpart 1. **Purpose.** ~~The Class 2 and Class 7 numeric water quality standards for toxic pollutants in parts 7050.0220, 7050.0222, and~~

~~7050.0227 do not address all pollutants which may be discharged to surface waters and cause toxic effects. Therefore, methods are established in this part to address on a site-by-site and case-by-case basis the discharge into surface waters of toxic pollutants not listed in parts 7050.0220, 7050.0222, and 7050.0227.~~ The methods in this part and part 7050.0219 meet the objectives in part 7050.0217 and provide the basis for developing human health-based numeric chronic standards and site-specific numeric criteria for aquatic toxicity, human health, and fish-eating wildlife. The agency may also adopt new standards according to *Minnesota Statutes*, chapter 14, to replace those listed in parts 7050.0220 to 7050.0227 and 7052.0100 that are more stringent or less stringent if new scientific evidence shows that a change in the standard is justified.

Subp. 2. **Site-specific criteria.** The Class 2 and Class 7 numeric water quality standards for toxic pollutants in parts 7050.0220, 7050.0222, 7050.0227, and 7052.0100 do not address all pollutants that may be discharged to surface waters and cause toxic effects. Therefore, methods are established in this part and part 7050.0219 to address on a site-specific basis the discharge into surface waters of toxic pollutants not listed in parts 7050.0220, 7050.0222, 7050.0227, 7052.0100. Class 2 and Class 7 site-specific numeric criteria for toxic pollutants shall be derived by the commissioner using the procedures in this part.

[For text of items A and B, see M.R.]

Subp. 3. **Definitions.** For the purposes of parts 7050.0217 to 7050.0227, the following terms have the meanings given them.

[For text of items A and B, see M.R.]

C. "Adjustment factor, lifetime" or "$AF_{lifetime}$" means the numeric multiplier used to modify the adult-based cancer slope factor for lifetime (70 years standard in risk characterization) exposure based on chemical-specific data.

D. "Adverse effect" means a biochemical change, functional impairment, or pathologic lesion that affects the performance of the whole organism or reduces an organism's ability to respond to an additional environmental challenge.

E. "Age-dependent adjustment factor" or "ADAF" means the default numeric modifiers to the cancer slope factor that account for the increased susceptibility to cancer from early-life exposures to linear carcinogens in the absence of chemical-specific data. For default use, there are three ADAF:

(1) $ADAF_{0<2}$ = 10, for birth up to two years of age;

(2) $ADAF_{2\ to\ <16}$ = 3, for two up to 16 years of age; and

(3) $ADAF_{16+}$ = 1, for 16 years of age and older.

~~C.~~ F. "Available and reliable scientific data" means information derived from scientific literature including: published literature in peer reviewed scientific journals, USEPA ambient water quality criteria documents, and other reports or documents published by the USEPA or other governmental agencies.

~~D.~~ G. "Bioaccumulation factor" or "BAF" means the concentration of a pollutant in one or more tissues of an aquatic organism, exposed from any source of the pollutant but primarily from the water column, diet, and bottom sediments, divided by the average concentration in the solution in which the organism had been living, under steady state conditions.

H. "Bioaccumulative chemical of concern" or "BCC" has the meaning given in part 7052.0010, subpart 4.

~~E.~~ I. "Bioconcentration factor" or "BCF" means the concentration of a pollutant in one or more tissues of an aquatic organism, exposed only to the water as the source of the pollutant, divided by the average concentration in the solution in which the organism had been living, under steady state conditions.

J. "Biomagnification" means the increase in tissue concentration of a pollutant in aquatic organisms at successive trophic levels through a series of predator-prey associations, primarily occurring through dietary accumulation. The expression used to quantify this increase is the biomagnification factor or "BMF." For a given water body, the BMF is calculated as:

(1) the ratio of the tissue concentration of a pollutant in a predator at a particular trophic level to the tissue concentration in its prey at the next lower trophic level; or

(2) the ratio estimated from a comparable laboratory model.

K. "Biota-sediment accumulation factor" or "BSAF" means the ratio (in kilogram of organic carbon/kilogram of lipid) of a pollutant's lipid-normalized concentration in tissue of an aquatic organism to its organic carbon-normalized concentration in surface sediment, where:

(1) the ratio does not change substantially over time;

(2) both the organism and its food are exposed; and

(3) the surface sediment is representative of average surface sediment in the vicinity of the organism.

~~F.~~ L. "Cancer potency slope factor" or ~~"q1*"~~ "CSF" means a factor indicative of a chemical's human cancer causing potential~~. The q1* is the upper 95 percent confidence limit (one-sided) of the slope from a linear nonthreshold dose-response model used by the USEPA to provide an upper bound estimate of incremental cancer risk. The q1* assumes a lifetime exposure and is expressed in days times kilogram body weight per milligram toxicant (d x kg/mg).~~ and an upper-bound estimate of cancer risk per increment of dose that can be used to estimate cancer risk probabilities for different exposure levels. CSF is expressed in units of cancer incidence per milligram of pollutant per kilogram of body weight-day (mg/kg-day)$^{-1}$.

M. "Cancer risk level" or "CR" means the probability that daily exposure to a carcinogen over a lifetime may induce cancer. CR refers to an incremental or additional excess cancer risk equal to 1 x 10^{-5} (1 in 100,000) and is applied with the cancer potency slope factor for single chemicals and for mixtures.

N. "Carcinogen, linear" or "C" means a chemical agent for which, either by a known mode of action or a conservative assumption, the associated cancer risk varies in direct proportion to the extent of exposure and for which there is no risk-free level of exposure. The toxicological value for a C is the cancer potency slope factor. Seventy years is the standard lifetime duration used by United States Environmental Protection Agency in the characterization of lifetime cancer risk.

O. "Carcinogen, nonlinear" or "NLC" means a chemical agent for which, particularly at low doses, the associated cancer risk does not rise in direct proportion to the extent of exposure and for which a threshold level of exposure exists below which there is no cancer risk. For NLC, the reference dose is the toxicological value used as the threshold for cancer risk.

~~G.~~ P. "Chronic toxicity" means a stimulus that lingers or continues for a long period of time, often one-tenth the life span or more. A chronic effect can be mortality, reduced growth, reproduction impairment, harmful changes in behavior, and other nonlethal effects.

~~H.~~ Q. "Chronic criterion" or "CC" ~~means~~ and "chronic standard" or "CS" mean the highest water concentration or fish tissue concentration of a toxicant or effluent to which ~~organisms, including~~ aquatic life, humans ~~or,~~ wildlife, or other organisms can be exposed indefinitely without causing chronic toxicity. CC represents a site-specific chronic criterion developed under this part and part 7050.0219 or part 7052.0110. CS represents a chronic standard listed in parts 7050.0220 and 7050.0222 or in part 7052.0100. CC and CS are further distinguished by the organisms they are developed to protect and medium in which they apply:

~~"CC_{df}." means a chronic criterion~~

(1) CC_{tox} or CS_{tox} represent values applied in surface water developed to protect aquatic life from chronic toxicity;

(2) CC_{dft} or CS_{dft} represent values applied in surface water based on protecting humans from exposure to the pollutant from ~~both~~ drinking water ~~and,~~ eating ~~sport-caught~~ fish~~. "CC_f." means a chronic criterion,~~ and aquatic recreation;

(3) CC_{ft} or CS_{ft} represent values applied in surface water based on protecting humans from exposure to the pollutant from eating ~~sport-caught~~ fish ~~only.~~ and aquatic recreation;

(4) CC_{ft} or CS_{ft} represent values applied in fish tissue based on protecting humans from exposure to the pollutant from eating fish; and

(5) ~~"~~CC_w~~." means a chronic criterion~~ represents values applied in surface water based on protecting wildlife from exposure to the pollutant from eating aquatic organisms.

~~I. "Chronic standard" or "CS" means the highest water concentration of a toxicant to which organisms can be exposed indefinitely without causing chronic toxicity. Chronic standards are listed in parts 7050.0220 and 7050.0222.~~

~~J.~~ R. "Chronic value" means the geometric mean of the highest tested concentration that did not cause an unacceptable adverse effect and the lowest tested concentration that did cause an unacceptable adverse effect, and in which all higher test values cause an effect, in an approved chronic test.

~~K.~~ S. "Cold water fisheries" means a community of fish including species of trout and salmon from the Salmonidae family that inhabit trout waters as defined in part 7050.0420.

~~L.~~ T. "Criterion" means a number or numbers established for a pollutant derived under this part or part 7050.0219 or 7052.0110, or issued by the USEPA, to protect aquatic life, humans, or wildlife.

U. "Developmental health endpoint" or "developmental toxicity" means an adverse effect on the developing organism that may result from parental exposure prior to conception, maternal exposure during prenatal development, or direct exposure postnatally until the time of sexual maturation. Developmental toxicity may be detected at any point in the lifespan of the organism. The major manifestations of developmental toxicity include:

(1) death of the developing organism;

(2) structural abnormality;

(3) altered growth; or

(4) functional deficiency.

~~M.~~ V. "Duration" means the time over which the instream concentration of a pollutant is averaged for comparison with the standard or criterion.

W. "Durations for human health-based algorithms" or "D" means the length of the exposure period under consideration for noncancer and linear cancer algorithms.

(1) The four default D used in developing reference doses and corresponding intake rates are:

(a) acute: a period of 24 hours or less;

(b) short-term: a period of more than 24 hours, up to 30 days;

(c) subchronic: a period of more than 30 days, up to eight years based on application of the less than ten percent standard life expectancy of 70 years for humans; or

(d) chronic: a period of more than eight years.

(2) The default durations for use in the linear cancer algorithms with age dependent adjustment factors are:

(a) two years for the birth up to two-year age group;

(b) 14 years for the two- up to 16-year age group; and

(c) 54 years for the 16- up to 70-year age group. For any algorithm, use of chemical-specific data to define durations for noncancer or linear cancer algorithms are preferred when acceptable data are available.

~~N.~~ X. "Effect concentration" or "EC50" means the toxicant concentration that causes equilibrium loss, immobilization, mortality, or other debilitating effects in 50 percent of the exposed organisms during a specific time of observation.

Y. "Endocrine" or "E" means a change in circulating hormone levels or interactions with hormone receptors, regardless of the organ or organ system affected. Health endpoints with or without the E designation are deemed equivalent, for example, thyroid (E) = thyroid, and must be included in the same health risk index equation.

~~O.~~ Z. "Final acute value" or "FAV" means an estimate of the concentration of a pollutant corresponding to the cumulative probability of 0.05 in the distribution of all the acute toxicity values for the genera or species from the acceptable acute toxicity tests

conducted on a pollutant. The FAV is the acute toxicity limitation applied to mixing zones in part 7050.0210, subpart 5; and to dischargers in parts 7053.0215, subpart 1; 7053.0225, subpart 6; and 7053.0245, subpart 1.

AA. "Food chain multiplier" or "FCM" means the ratio of a bioaccumulation factor by trophic level to an appropriate bioconcentration factor. FCM refers to values developed using USEPA models or from available and reliable field studies.

BB. "Frequency" means the number of times a standard can be exceeded in a specified period of time without causing acute or chronic toxic effects on the aquatic community, human health, or fish-eating wildlife.

~~P.~~ CC. "Genus mean acute value" or "GMAV" means the geometric mean of the SMAVs available for the genus.

DD. "Health risk index" means the sum of the quotients calculated by identifying all chemicals that share a common health endpoint or are based on linear carcinogenicity and dividing the water or fish tissue concentration for each chemical (measured or statistically derived) by its applicable chronic standard or chronic criterion. To meet the objectives in part 7050.0217, the health risk index must not exceed a value of one. The equations for the risk indices are found in part 7050.0222, subpart 7, items D and E.

EE. "Health risk index endpoint" or "health endpoint" means the general description of toxic effects used to group chemicals for the purpose of calculating a health risk index.

FF. "Intake rate" or "IR" means rate of ingestion, inhalation, or dermal contact, depending on the route of exposure, expressed as the amount of a media taken in, on a per body weight and daily basis, for a specified duration.

~~Q.~~ GG. "Lethal concentration" or "LC50" means the toxicant concentration killing 50 percent of the exposed organisms in a specific time of observation.

~~R.~~ HH. "Lowest observable adverse effect level" or "LOAEL" means the lowest ~~tested concentration~~ exposure level that caused a statistically or biologically significant ~~occurrence of an adverse effect in comparison with a control when all higher test concentrations caused adverse effects~~ increase in the frequency or severity of adverse effects observed between the exposed population and its appropriate control group.

II. "Magnitude" means the acceptable amount of a toxic pollutant in water or fish tissue expressed as a concentration.

~~S.~~ JJ. "Maximum criterion" or "MC" means the highest concentration of a toxicant in water to which aquatic organisms can be exposed for a brief time with zero to slight mortality. The MC equals the FAV divided by two.

~~T.~~ KK. "Maximum standard" or "MS" means the highest concentration of a toxicant in water to which aquatic organisms can be exposed for a brief time with zero to slight mortality. The MS equals the FAV divided by two. Maximum standards are listed in part 7050.0222.

LL. "MDH" means the Minnesota Department of Health.

MM. "Mode of action" or "MOA" means the sequence of key events following pollutant or chemical exposure upon which the toxic outcome depends.

~~U.~~ NN. "National methods" means the methods the USEPA uses to develop aquatic life criteria as described in Stephan, C.E., D.J. Mount, D.J. Hansen, J.H. Gentile, G.A. Chapman, and W.A. Brungs, 1985, "Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses," USEPA, Office of Research and Development, Environmental Research Laboratories, Duluth MN; Narragansett, RI, Corvallis, OR. 98 p; available through the National Technical Information Service, Springfield, VA. (Publication PB85-227049)

~~V.~~ OO. "No observable adverse effect level" or "NOAEL" means ~~the highest tested concentration that did not cause a statistically significant occurrence of an adverse effect in comparison with a control when no lower test concentration caused an injurious or adverse effect~~ an exposure level at which there is no statistically or biologically significant increase in the frequency or severity of adverse effects between the exposed population and its appropriate control group.

~~W.~~ PP. "Octanol to water partition coefficient" or "K_{ow}" means the ratio of the concentration of a ~~substance~~ chemical in the octanol phase to its concentration in the aqueous phase of a two-phase octanol to water system after equilibrium of the ~~substance~~ chemical between the two phases has been achieved. The base 10 logarithm of the K_{ow} or log K_{ow} is used in the calculation of bioaccumulation factors. The $\log_{~~10~~} K_{ow}$ has been shown to be proportional to the bioconcentration potential of lipophilic organic chemicals.

~~X. "Parachor" means the surface tension adjusted molar volume, and specifically is the molecular weight of a liquid times the fourth root of its surface tension, divided by the difference between the density of the liquid and the density of the vapor in equilibrium with it; essentially constant over wide ranges of temperature. Parachor relates to the physical properties of a molecule that affect its potential to bioaccumulate in aquatic organisms.~~

~~Y.~~ QQ. "Percent effluent" means the representation of acute or chronic toxicity of an effluent as a percent of whole effluent mixed in dilution water, where acute toxicity is expressed by LC50s or EC50s and chronic toxicity is expressed by ~~NOAELs~~ NOAEL.

~~Z.~~ RR. "Reference dose" or "RfD" means an estimate of a ~~daily exposure to the human population, including sensitive subpopulations, that is likely to be without appreciable risk or deleterious effects over a lifetime. The RfD is expressed in units of daily dose, mg/kg/day.~~ dose for a given duration to the human population, including susceptible subgroups such as infants, that is likely to be without an appreciable risk of adverse effects during a lifetime. It is derived from a suitable dose level at which there are few or no statistically or biologically significant increases in the frequency or severity of an adverse effect between the dosed population and its associated control group. The RfD includes one or more divisors, applied to the suitable dose level, accounting for:

(1) uncertainty in extrapolating from mammalian laboratory animal data to humans;

(2) variation in toxicological sensitivity among individuals in the human population;

(3) uncertainty in extrapolating from effects observed in a short-term study to effects of long-term exposure;

(4) uncertainty in using a study in which health effects were found at all doses tested; and

(5) uncertainty associated with deficiencies in the available data. The RfD is expressed in units of daily dose as milligrams of chemical per kilogram of body weight-day or mg/kg-day.

~~AA.~~ SS. "Relative source contribution factor" or "RSC" means the ~~fraction of the total allowable daily dose of a toxic pollutant that is attributed to drinking water and fish consumption relative to other sources of the pollutant to humans, such as air or food, in the calculation of criteria.~~ percentage or apportioned amount (subtraction method) of the reference dose for a pollutant allocated to surface water exposures from drinking or incidental water ingestion and fish consumption. In the absence of sufficient data to establish a pollutant- or chemical-specific RSC value, the default RSC is 0.2 or 0.5 as described in part 7050.0219, subpart 5.

~~BB.~~ TT. "Species mean acute value" or "SMAV" means the geometric mean of all the available and acceptable acute values for a species.

~~CC.~~ UU. "Standard" means a number or numbers established for a pollutant or water quality characteristic to protect a specified beneficial use as listed in parts 7050.0221to 7050.0227. The standard for a toxic pollutant includes the CS, MS, and FAV. Some pollutants do not have an MS or an FAV due to insufficient data. For these pollutants, the CS alone is the standard.

VV. "Toxic effect" means an observable or measurable adverse biological event in an organ, tissue, or system. The designation of health endpoints does not exclude other possible observable or measurable biological events. For the purpose of grouping chemicals and creating a health risk index when multiple chemicals are present, toxic effects may be ascribed to more general health risk index endpoints or health endpoints.

~~DD.~~ WW. "Toxic pollutant" has the meaning given it in part 7050.0185, subpart 2, item F. Toxic pollutant is used interchangeably in this part and parts 7050.0217, 7050.0219, and 7050.0222, subpart 7, items B to G, with the terms "pollutant" and "chemical."

~~EE.~~ XX. "Toxic unit" means a measure of acute or chronic toxicity in an effluent. One acute toxic unit (TUa) is the reciprocal of the effluent concentration that causes 50 percent effect or mortality to organisms for acute exposures (100/LC50); one chronic toxic unit (TUc) is the reciprocal of the effluent concentration that causes no observable adverse effect level on test organisms for chronic exposures (100/

NOAEL).

YY. "Trophic level" or "TL" means the food web level in an ecosystem that is occupied by an organism or group of organisms because of what they eat and how they are related to the rest of the food web. For example, trophic level 3 in an aquatic ecosystem consists of small fish such as bluegills, crappies, and smelt and trophic level 4 consists of larger carnivorous fish such as walleye, northern pike, and most trout species.

~~FF.~~ ZZ. "USEPA" means the United States Environmental Protection Agency.

~~GG.~~ AAA. "Water quality characteristic" means a characteristic of natural waters, such as total hardness or pH. Some water quality characteristics can affect the toxicity of pollutants to aquatic organisms.

~~HH.~~ BBB. "Whole effluent toxicity test" means the aggregate toxic effect of an effluent measured directly by a toxicity test. Effects on tested organisms are measured and expressed as toxic units or percent effluent for both acute and chronic whole effluent toxicity tests.

Subp. 4. **Adoption of USEPA national criteria.** The USEPA establishes aquatic life and human health-based criteria under section 304(a)(1) of the Clean Water Act, United States Code, title 33, section 1314. The USEPA criteria, subject to modification as described in this subpart, are applicable to Class 2 waters of the state. The USEPA has described the national methods for developing aquatic life criteria in "Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses."

USEPA criteria that vary with an ambient water quality characteristic such as total hardness or pH will be established for specific waters or reaches using data available to the commissioner. Central values such as the means or medians for the characteristic will be used unless there is evidence to support using different values. Values for water quality characteristics can be estimated for specific waters or reaches that have no data by using data from a nearby watershed with similar chemical properties.

A. The USEPA aquatic life criteria are adopted unchanged by the agency, unless modified under item C, as the criteria applicable to designated ~~trout waters. Trout (Class 2A)~~ Class 2A waters ~~are listed~~ in parts 7050.0420 and 7050.0470.

[For text of item B, see M.R.]

C. If the commissioner finds that the information that supports a USEPA criterion is no longer current or complete for reasons including, but not limited to, changes to the relationship between a water quality characteristic and toxicity; the ACR; the weight given to toxicity data for a commercially or recreationally important species; ~~the RfD; the ql*; or the BAF~~ or the human health-based methods; then the commissioner shall evaluate all available information and modify the criterion according to the information and with the objectives in part 7050.0217 and the methods in this part and part 7050.0219. Any effluent limitation determined to be necessary based on site-specific criteria derived under this item shall only be required after the discharger has been given notice to the specific proposed effluent limitations and an opportunity to request a hearing as provided in part 7000.1800.

Subp. 5. **Toxicity-based criteria.** Toxicity-based aquatic life criteria shall be determined using the methods in this subpart when no USEPA criterion is available.

[For text of items A to D, see M.R.]

E. The CC_{tox} is the FAV divided by an ACR. Available chronic data are used to determine ACRs as described in item F and measured chronic values are compared to the CC_{tox}. If an approved chronic value for a commercially, recreationally, or ecologically important freshwater species is lower than the CC_{tox}, the CC_{tox} will be set to equal that chronic value.

[For text of item F, see M.R.]

G. If the acute data available do not meet the requirements in items A and B, toxicity-based criteria can be determined by the method in this item. This method is not applicable to ionizable organic chemicals, or to bioaccumulative organic chemicals and pesticides with ~~BCFs~~ BCF greater than 5,000 or log K_{ow} values greater than 5.19.

[For text of subitems (1) to (10), see M.R.]

(11) The CC_{tox} is calculated by dividing the FAV by the appropriate ACR.

(12) If chronic data are available, they are used to determine measured ~~ACRs~~ ACR as described in item F, and chronic data are compared to the CC_{tox}.

Subp. 6. [See repealer.]

Subp. 7. [See repealer.]

[For text of subp 8, see M.R.]

Subp. 9. **Wildlife-based criteria.** The agency shall use the procedures in this subpart to establish wildlife-based criteria. Wildlife criteria shall protect wildlife consumers of freshwater aquatic organisms from adverse effects of toxic pollutants. Wildlife criteria are applicable to all surface waters, subject to the exceptions in subpart 10, item B, subitem (1).

[For text of item A, see M.R.]

B. Wildlife-based criteria are calculated using the following formula:

$$CC_w \text{ mg/L} = \frac{NOAEL \times BWt \times SSF}{DW + (F \times BAF)}$$

where: CC_w = wildlife chronic criterion in mg/L

NOAEL = no observable adverse effect level in mg of substance per kg of body weight per day (mg/kg BWt/day) as derived from mammalian or avian toxicity studies. If the NOAEL is in mg/L, the NOAEL will be multiplied by the average daily volume of water consumed by the test animals in liters per day and divided by the average weight of the test animals in kg. If the NOAEL is in mg/kg of food consumed, the NOAEL will be multiplied by the average amount of food consumed daily by the test animals and divided by the average weight of the test animals in kg

BWt = average body weight of test organisms in kg

SSF = species sensitivity factor to account for difference in the sensitivity in test species. This factor will vary between 1 and 0.1. The appropriate factor will be determined by the commissioner based on available and reliable scientific data on the relative sensitivity of the test organism compared to other wildlife species

DW = average volume of water consumed per day by the test animals in liters

F = average amount of food consumed per day by test animals in kg

BAF = BAF in liters per kg

[For text of items C and D, see M.R.]

Subp. 10. **Applicable criteria or human health-based standard.** ~~The criterion for a pollutant includes: the CC, the MC, and the FAV.~~ The final criteria or chronic standard for human health for toxic pollutants for surface waters are must be the lowest of the applicable criteria or standards for human health derived under this part and part 7050.0219.

A. Applicable criteria or standards for human health by use for Class 2A, 2Bd, 2B, 2C, and 2D surface waters are listed for each applicable population protected (aquatic life, humans, and fish-eating wildlife). The applicable criteria or standards for human health must be the lowest of the ~~following~~ CC or CS as described in subitems (1) to (3):

(1) for aquatic life toxicity: a CC_{tox} and MC based on toxicity to aquatic organisms from subpart 4 or 5 or a CC_{tox} based on plant toxicity from subpart 4 or 5;

~~(2) a CC based on plant toxicity from subpart 4 or 5;~~

~~(3)~~ (2) for human health: a ~~CC_{df} or CC_f from subparts 6 and 7~~ CC or CS by medium (water or fish) as described in part 7050.0219, subpart 2, or a concentration that will prevent unacceptable taste or odor in water, fish, or other edible aquatic organisms from subpart 8; or

~~(4) a concentration that will prevent unacceptable taste or odor in water, fish, or other edible aquatic organisms from subpart 8; or~~

~~(5)~~ (3) when available, for fish-eating wildlife: a CC_w from subpart 9.

B. Applicable criteria for Class 7 waters ~~are~~ must be the lowest of the following:

[For text of subitems (1) and (2), see M.R.]

C. If the site-specific application of criteria developed in this subpart is used to establish an effluent limitation for national pollutant discharge elimination system and state disposal system permits or to establish the degree of remedial action cleanup activities, the provisions of part 7050.0222, subpart 7, items B to ~~E~~ G, apply.

D. The CS or CC and MS or MC must be averaged over the durations described in part 7050.0222, subpart 7, item C.

7050.0219 HUMAN HEALTH-BASED CRITERIA AND STANDARDS.

Subpart 1. **Objective.** Human health-based criteria and standards protect humans from potential adverse effects of eating fish and edible aquatic organisms and incidental ingestion of water while recreating in Class 2 waters and from the consumption of drinking water from Class 1 surface waters (includes Class 2A and 2Bd waters). Human health-based criteria and standards must be determined using the methods in this part.

Subp. 2. **Applicability of methods.** Human health-based chronic criteria (CC) or chronic standards (CS) must be evaluated based on the pollutant's toxicological profile: noncarcinogen or nonlinear carcinogen (NLC), developmental susceptibility, and linear carcinogen (C).

A. Algorithms for these toxicological profiles by Class 2 subclasses are described in subparts 13 to 15. Other scientifically defensible algorithms may be applied by the commissioner on a chemical-specific basis for evaluating developmental susceptibility to toxic pollutants in fish tissue based on the consideration listed in subparts 3 to 5.

B. The most stringent CC or CS by medium (water or fish tissue), Class 2 subclass, and toxicological profile, or taste and odor criteria as described in part 7050.0218, subpart 8, are the final applicable human health-based CC or CS.

Subp. 3. **Available and reliable scientific data.** The data and information used to develop a site-specific CC or CS must be approved by the commissioner. The commissioner must consider measures of availability and reliability of the data and information.

Subp. 4. **Toxicological values.** The RfD used to calculate criteria for noncarcinogenic and nonlinear carcinogenic chemicals (NLC) and the CSF and $AF_{lifetime}$ or CSF and ADAF used to calculate CC or CS for linear carcinogenic (C) chemicals are obtained from the MDH or developed according to parts 4717.7820, subparts 5 and 21, and 7050.0218, subpart 3.

Subp. 5. **Exposure values.** Drinking water intake rates are obtained from the MDH. RSC uses a default value of 0.2 for most pollutants, unless:

A. there are no significant known or potential sources other than those addressed for the designated use, then 0.5 must be used; or

B. sufficient exposure data are available to support an alternative pollutant-specific value between 0.2 and 0.8.

Subp. 6. **Bioaccumulation factors.** This subpart describes the process and data for deriving bioaccumulation factors (BAF) used in the calculation of the human health-based chronic criteria (CC) or chronic standards (CS).

A. Information used for defining BAF must be consistent with the pollutant form used to derive the RfD or CSF. BAF development must also consider other forms that bioaccumulate in fish tissue. The preferred bioaccumulation data are available and reliable field and laboratory studies.

B. A general description of the steps and data used to determine final state or site BAF are listed in subitems (1) to (6) and described in detail in subparts 7 to 12.

(1) Categorize the pollutant based on certain properties into one of three broadly defined chemical categories: nonionic organic, ionic organic, or inorganic and organometallic chemicals as described in subpart 7.

(2) Define the methods for developing baseline BAF as described in subpart 8. A baseline BAF is the expression of the BAF based on the bioavailable or freely dissolved fraction of a pollutant in the ambient water and normalized concentration of the pollutant within the organism.

(3) Determine the relevant procedure (1 to 6) for identifying the acceptable baseline BAF methods (maximum of four) and their hierarchy for developing individual or aquatic species-specific baseline BAF as described in subpart 9.

(4) Calculate species mean baseline BAF from acceptable individual baseline BAF as described in subpart 10.

(5) Determine final baseline BAF for TL_3 and TL_4 as described in subpart 11.

(6) Develop final state or site BAF for TL_3 and TL_4 based on default parameters by Class 2 subclass or site-specific data as described in subpart 12.

Subp. 7. **Chemical categorization.** For BAF purposes, organic chemicals that have no or negligible ionization at the pH range of ambient surface waters are categorized as nonionic organic chemicals; organic chemicals that undergo ionization at the pH range of ambient surface waters are categorized as ionic organic chemicals and further delineated for BAF development based on subpart 9, item C; organometallic chemicals and other chemicals or elements are categorized as organometallic and inorganic chemicals.

Subp. 8. **Methods for baseline BAF.** The four methods for developing baseline BAF in items A to D are listed in a hierarchy from most preferred to least preferred, except as noted in subpart 9: use of field-measured BAF studies (field BAF); use of field-measured BSAF studies (field BSAF); use of laboratory-measured BCF studies with food chain multipliers (lab BCF*FCM); and use of octanol-water partition coefficients with food chain multipliers (K_{ow}*FCM). Where relevant, differences in the baseline BAF methods are described by chemical categorization.

A. Method 1: Field BAF. The field-measured BAF for a nonionic organic chemical is calculated based on the total concentration of the chemical in the appropriate tissue of the aquatic organism (on a wet tissue basis) and the total concentration of chemical in ambient surface water at the site of sampling (BAF^t_T).

measured $BAF^t_T = C_l/C_w$

where: BAF^t_T = field-measured BAF based on total concentration in tissue and water (L/kg)
C_l = total concentration of the chemical in the specified wet tissue (µg/kg)
C_w = total concentration of the chemical in water (µg/L)

The measured BAF is converted to baseline BAF or BAF_1^{fd} by the following equation:

$$\text{baseline } BAF_l^{fd} = \left[\frac{\text{measured } BAF_T^t}{f_{fd}}\right]\left(\frac{1}{f_l}\right)$$

where: baseline BAF_1^{fd} = BAF expressed on a freely dissolved and lipid-normalized basis (L/kg)
f_1 = fraction of the tissue that is lipid
f_{fd} = fraction of the total chemical that is freely dissolved in ambient surface water

The freely dissolved fraction or f_{fd} is the portion of the nonionic organic chemical that is not bound to particulate organic carbon or dissolved organic carbon and is calculated:

$$f_{fd} = \frac{1}{[1 + (POC \times K_{OW}) + (DOC \times 0.08 \times K_{OW})]}$$

where: POC = concentration of particulate organic carbon (kg/L)
DOC = concentration of dissolved organic carbon (kg/L)
K_{OW} = n-octanol water partition coefficient for the chemical

POC and DOC concentrations are obtained from the original study from which the field-measured BAF is determined. If POC and DOC concentrations are not reported in the BAF study, reliable estimates of POC and DOC are obtained from other studies at closely related sites within the same water body. If no study data are available, the USEPA national default DOC and POC values are used, as they are representative of average ambient surface water conditions. The USEPA national default values are DOC of 2.9 mg/L and POC of 0.5 mg/L, converted to kg/L by dividing by 1,000,000.

For the field-measured BAF for a chemical classified as inorganic and organometallic, the field BAF is equal to the baseline BAF and is not expressed on a lipid or freely dissolved fraction basis. Normalization on other characteristics must be supported by chemical-specific

data.

B. Method 2: Field BSAF. For nonionic organic chemicals, the field-measured BSAF is determined by relating lipid-normalized concentration of the chemical in the appropriate tissue of the aquatic organism to organic carbon-normalized concentrations of the chemical in surface sediment.

$$BSAF \equiv \frac{C_l}{C_{soc}}$$

where: BSAF = biota-sediment accumulation factor for the chemical (kg of sediment organic carbon/kg of lipid)

C_l = lipid-normalized concentration of the chemical in the specified wet tissue (µg/g lipid), calculated as:

$$C_l \equiv \frac{C_t}{f_l}$$

where: f_l = fraction lipid content in the tissue

Other variables as defined under item A

C_{soc} = organic-carbon normalized concentration of a chemical in surface sediment samples (µg/g sediment organic carbon), calculated as:

$$C_{soc} \equiv \frac{C_s}{f_{oc}}$$

where: C_s = concentration of chemical in dry sediment (µg/g sediment)

f_{oc} = fraction organic carbon in dry sediment

The measured BSAF is converted to a baseline BAF or BAF_l^{fd} by the following equation:

$$(\text{baseline } BAF_l^{fd})_i \equiv (BSAF)_i \frac{(Đ_{socw})_r (D_{i/r}) (K_{OW})_i}{(K_{ow})_r}$$

where: $(\text{baseline } BAF_l^{fd})_i$ = BAF expressed on a freely dissolved and lipid-normalized basis for chemical of interest "i" or the chemical that is the basis of the criteria (L/kg)

$BSAF_l$ = measured BSAF for the chemical "i" (kg organic carbon/kg of lipid)

$(Đ_{socw})_r$ = sediment to water partition coefficient or sediment organic carbon to freely dissolved concentration ratio of the reference chemical "r." Reference chemicals with $(Đ_{socw})_r/(K_{ow})$ similar to that of the chemical of interest are preferred for this method (L/kg sediment organic carbon)

where: $(C_{soc})_r$ = concentration of the reference chemical "r" in dry sediment normalized to sediment organic carbon (µg/kg sediment organic carbon)

$(C_w^{fd})_r$ = concentration of the reference chemical "r" freely dissolved in water (µg/L)

$(D_{i/r})$ = ratio between $Đ_{socw/}K_{ow}$ for chemicals "i" and reference chemical "r"; a ratio equal to or close to one is preferred

$(K_{ow})_i$ = octanol-water partition coefficient for the chemical "i"

$(K_{ow})_r$ = octanol-water partition coefficient for the reference chemical "r"

Other variables as defined under item A

C. Method 3: Lab BCF*FCM. The laboratory-measured BCF for nonionic organic chemicals is calculated based on the total concentration of the chemical in the appropriate tissue of the aquatic organism (on a wet tissue basis) and the total concentration of

chemical in the study water (BCF^{t}_{T}).

$$\text{measured } BCF^{t}_{T} = \frac{C_t}{C_w}$$

where: C_w = total concentration of chemical in the laboratory test water (µg/L)
Other variables as defined under item A

Baseline BAF_{1}^{fd} equation:

where: f_{fd} = fraction of the total chemical in the test water that is freely dissolved, where POC and DOC or reasonable estimates based on total organic carbon (TOC) values measured in the test water are used, unless not available, then the following defaults are used based on typical lab water characteristics: DOC of 2.5 mg/L and POC at 0 mg/L, converted to kg/L by dividing by 1,000,000
FCM = food chain multiplier
Other variables as defined under item A

For ionic organic, inorganic, and organometallic chemicals, based on available data, the laboratory BCF is equal to the baseline BAF and is not expressed on a lipid or freely dissolved fraction basis. Normalization on other characteristics must be supported by chemical-specific data. FCM must come from field BAF studies.

D. Method 4: K_{ow}*FCM. In this method, K_{ow} is assumed to be equal to the baseline BAF_{1}^{fd} for certain nonionic organic chemicals described in the procedures.

baseline BAF_{1}^{fd} = (FCM) x (K_{ow})

$$\text{baseline } BAF_{1}^{fd} = (FCM)\left[\frac{\text{measured } BCF_{T}^{t}}{f_{fd}} - 1\right] x \left(\frac{1}{f_1}\right)$$

where: Variables as defined under items A and C

Subp. 9. **Hierarchy of acceptable baseline BAF methods.** Determine the hierarchy of acceptable baseline BAF methods available under subpart 8 for appropriate use based on the chemical categorization of the pollutant and other relevant properties as described under Procedures 1 to 6.

A. Procedures 1 to 6 are used for defining the hierarchy and use of the four baseline BAF methods based on chemical categorization and a chemical's ionization state in ambient surface waters, hydrophobicity, biomagnification, and metabolism in aquatic organisms, primarily freshwater fish species. Table 1 provides the basic information for identifying the acceptable procedures and hierarchy for baseline BAF methods as described under items B to D:

Table 1.
Chemical Categorization

Nonionic Organic and Ionic (negligible ionization) Organic Chemicals				Inorganic, Organometallic, and Ionic Chemicals	
Hydrophobicity				Biomagnification Factor (BMF)	
log K_{ow} e" 4		log K_{ow} < 4		BMF d" 1,000	BMF > 1,000
Metabolism in Aquatic Organisms (Fish)					
Low or Unknown	High	Low or Unknown	High		
Procedures:					
Procedure 1 1) Field BAF 2) Field BSAF 3) Lab BCF*FCM 4) K_{ow}*FCM	Procedure 2 1) Field BAF 2) Field BSAF 3) Lab BCF	Procedure 3 1) Field BAF or Lab BCF 2) K_{ow}	Procedure 4 Field BAF or Lab BCF	Procedure 5 Field BAF or Lab BCF	Procedure 6 1) Field BAF 2) LabBCF*FCM

B. For nonionic (neutral) organic chemicals, defined as chemicals that have no or negligible ionization in ambient surface water, Procedures 1 to 4 describe the hierarchy of acceptable baseline BAF methods to use.

(1) Procedure 1 applies to nonionic organic chemicals with moderate to high hydrophobicity defined as log K_{ow} greater than or equal to (e") 4 and either a low level of documented metabolism in aquatic organisms or lack of sufficient data to characterize metabolism. All four baseline BAF methods are available for use based on the stated hierarchy in Table 1 and availability of acceptable data.

(2) Procedure 2 applies to nonionic organic chemicals with moderate to high hydrophobicity defined as log K_{ow} e" 4 and a high level of documented metabolism in aquatic organisms. The acceptable methods are field BAF, BSAF, and lab BCF*FCM, where FCM is equal to one.

(3) Procedure 3 applies to nonionic organic chemicals with low hydrophobicity defined as log K_{ow} less than (<) 4 and either a low level of documented metabolism in aquatic organisms or lack of sufficient data to characterize metabolism. The acceptable methods are field BAF or lab BCF*FCM, with equal preference given, and K_{ow}*FCM, where FCM is equal to one in both methods.

(4) Procedure 4 applies to nonionic organic chemicals with low hydrophobicity defined as log K_{ow} < 4 and high levels of documented metabolism in aquatic organisms. Equal preference is given to both acceptable methods: field BAF or lab BCF*FCM, where FCM is equal to one.

C. For ionic organic chemicals (defined as chemicals that can readily accept or donate protons) the procedures that define the available hierarchy and appropriate baseline BAF methods depend on further characteristics of the chemical. The main characteristics relate to exhibiting primarily nonionic (neutral) characteristics (ionization is negligible) or ionic characteristic in average surface water pH ranges based on its acid dissociation constant (K_a) expressed as the negative base 10 log (pK_a) and functional group or groups:

(1) When ionization is negligible, the chemical is categorized as a nonionic organic chemical and baseline BAF procedures are applied based on hydrophobicity and metabolism characteristics described for Procedures 1 to 4 under item B, subitems (1) to (4).

(2) In all other cases, the chemical is categorized with inorganic and organometallic chemicals and addressed with Procedure 5 or 6 under item D, subitem (1) or (2).

Available chemical-specific data that supports more defensible baseline BAF methods must be used in place of these default assignments.

D. Inorganic and organometallic chemicals are defined as inorganic minerals, other inorganic chemicals, and elements: metals and metalloids and organometallic chemicals, and Procedures 5 and 6 define the use of acceptable baseline BAF methods. Procedures 5 and 6 are distinguished by the determination of whether the chemical demonstrates biomagnifications through field BAF or laboratory BCF studies, with BAF or BMF greater than 1,000 being the cut-off for this purpose. BMF is calculated using chemical concentrations in the tissue of aquatic organisms at two successive trophic levels as:

$$BMF_{(TL,\,n)} = C_{t\,(TL,\,n)} / C_{t\,(TL,\,n-1)}$$

where: $C_{t\,(TL,\,n)}$ = total concentration of relevant chemical form or forms in appropriate tissue of predator organism at trophic level "n" (may be either wet weight or dry weight concentration so long as both the predator and prey concentrations are expressed in the same manner) (µg/kg)

$C_{t\,(TL,\,n-1)}$ = total concentration of relevant chemical form or forms in appropriate tissue of prey organism at the next lower trophic level from the predator (may be either wet weight or dry weight concentration so long as both the predator and prey concentrations are expressed in the same manner) (µg/kg)

(1) Procedure 5 applies when geometric mean BAF or BMF is less than or equal to 1,000 when comparing successive trophic level ratios up through trophic level 4. Equal preference is given to field BAF or lab BCF*FCM, where FCM is equal to one. For this procedure, field BAF or lab BCF is applied as the baseline BAF.

measured $BAF^{t}_{T} = C_t/C_w$ or $BCF^{t}_{T} = C_t/C_w$ are applied as the baseline BAF.

where: Variables as defined under subpart 8

(2) Procedure 6 applies when geometric mean BAF or BMF is greater than 1,000 when comparing successive trophic level ratios up through trophic level 4. The acceptable methods are field BAF or lab BCF*FCM, with preference for field BAF. For this procedure, field BAF or lab BCF is applied as the baseline BAF.

$$\text{measured } BAF^{t}_{T} = C_{t}/C_{w} \quad \text{or} \quad BCF^{t}_{T} = C_{t}/C_{w} \quad \text{are applied as the baseline BAF.}$$

where: Variables as defined under subpart 8

Subp. 10. **Species mean baseline BAF.** Calculate species and mean baseline BAF from acceptable individual baseline BAF.

A. For each appropriate baseline BAF method, calculate species-mean baseline BAF using the geometric mean.

B. Any baseline BAF with large differences between species (greater than ten percent) needs additional justification for use in a species-mean baseline BAF.

C. Evaluate data uncertainties for consideration in method hierarchy application for calculating trophic level baseline BAF.

Subp. 11. **Final baseline BAF by trophic level.** Determine the final baseline BAF by trophic level (TL):

A. Calculate geometric mean baseline BAF for TL_3 and TL_4 using available species-means for each baseline BAF method. For Class 2A water, preference is given for Salmonidae data and developed as a single representative TL_4 baseline BAF for cold-water aquatic communities.

B. Combine species-means for methods that have equal preference in procedural hierarchies and have similarly reliable baseline BAF based on evaluation of data uncertainties for a final baseline BAF for TL_3 where applicable, and final baseline BAF for TL_4.

C. For some pollutants, TL_3 and TL_4 baseline BAF may be identical when not dependent on trophic level factors, such as lipid partitioning.

$$\text{state or site } BAF_{(TL\ n)} = \left[\left(\text{final baseline } BAF_{l}^{fd}\right)_{TL\ n} \times (f_{l})_{TL\ n} + 1\right] \times (f_{fd})$$

e BAF for TL_3 where applicable and TL_4 for use in

igible ionization as defined under subpart 7, for each TL_3 and TL_4, calculate a state or site BAF using the following equation:

where: $(\text{final baseline } BAF_{l}^{fd})_{TL\ n}$ = final trophic-level-mean baseline BAF expressed on a freely dissolved and lipid-normalized basis for trophic level "n" (L/kg)

$(f_{l})_{TL\ n}$ = lipid fraction of aquatic species consumed at trophic level "n" by Class 2 subclass: Class 2A = 0.06; Class 2Bd/2B/2C/2D = 0.02 for TL_3 and 0.015 for TL_4

f_{fd} = fraction of the total chemical in water that is freely dissolved in ambient waters

The default DOC and POC values for the state ambient Class 2 surface waters are 7.5×10^{-6} kg/L (7.5 mg/L) and 5×10^{-7} kg/L (0.5 mg/L), respectively. For a site BAF for use in site-specific criteria development, the DOC and POC values are from the site monitoring data, if available; in all other cases, the state defaults are used.

B. For inorganic and organometallic chemicals and ionic organic chemicals with ionization in natural waters, the baseline BAF^{t}_{T} using total chemical concentrations or bioavailable forms are directly applied as the state or site BAF:

$$\text{state } BAF_{(TL\ n)} \text{ or site BAF} = \text{final baseline } BAF_{(TL\ n)}$$

Subp. 13. **Algorithms for Class 2A or 2Bd surface waters.** This subpart describes human health-based criteria or standards for classes of surface waters designated for drinking water, fish consumption, and recreational use. To develop a final chronic criteria (CC_{dfr})

or standard (CS_{dfr}) applicable to surface waters designated Class 2A or 2Bd, items A to D must be evaluated for use based on the pollutant's toxicological profile: noncarcinogen or nonlinear carcinogen (NLC); developmental susceptibility; or linear carcinogen (C).

A. Algorithm for noncarcinogenic or NLC chemicals applicable to surface waters designated Class 2A or 2Bd to calculate: CC_{dfr} or CS_{dfr} =

$$\frac{RfD_{chronic}\text{ (mg/kg-d) x RSC (no units) x 1,000 µg/mg}}{\{DWIR_{chronic}\text{ (L/kg-d) + }FCR_{adult}\text{ (kg/kg-d)[(0.24 x }BAF_{TL3}\text{ (L/kg)) + (0.76 x }BAF_{TL4}\text{ (L/kg)]}\}}$$

where: CC_{dfr} or CS_{dfr} = drinking water plus fish consumption and recreation chronic criterion or standard in µg/L
$RfD_{chronic}$ = reference dose for chronic duration in mg/kg-day
RSC = relative source contribution factor
1,000 µg/mg = a factor used to convert milligram (mg) to microgram (µg);
there are 1,000 micrograms per milligram
$DWIR_{chronic}$ = drinking water intake rate for the chronic duration based on a 95th percentile time-weighted average from MDH; rate may be chemical-specific with sufficient data or use the default rate of 0.043 L/kg-d
FCR_{adult} = fish consumption intake rate of 0.00043 kg/kg-d based on 0.030 kg/day of amount of fish assumed to be consumed per day and 70 kg adult body weight or rate may be chemical-specific with sufficient data
BAF_{TL3} = final BAF for TL_3 fish in L/kg; accounts for 24 percent of fish consumed
BAF_{TL4} = final BAF for TL_4 fish in L/kg; accounts for 76 percent of fish consumed; for Class 2A, the BAF_{TL4} is applied to 100 percent of the FCR

B. Supplemental algorithm for developmental susceptibility for noncarcinogenic or NLC chemicals applicable to surface waters designated Class 2A or 2Bd to calculate: CC_{dev} or CS_{dev} =

$$\frac{RfD_{duration\ (acute,\ short\text{-}term,\ or\ subchronic)}\text{ (mg/kg-d) x RSC (no units)}}{DWIR_{duration\ (acute,\ short\text{-}term,\ or\ subchronic)}\text{ (L/kg-d)}}$$

where: CC_{dev} or CS_{dev} = developmental-based drinking water chronic criterion or standard in µg/L applied when shorter duration adverse effects and exposure parameters result in a more stringent chronic criterion or standard than calculated from item A
$RfD_{duration}$ = reference dose for acute, short-term, or subchronic duration in mg/kg-day
$DWIR_{duration}$ = drinking water intake rate for acute, short-term, or subchronic duration in L/kg-d; drinking water intake rate for the acute, short-term, and subchronic durations based on a 95th percentile time-weighted average from MDH; rate may be chemical-specific with sufficient data or use default rates of 0.289, 0.289, and 0.077 L/kg-d, respectively
Other variables as defined under item A

C. Algorithm for linear carcinogenic chemicals with lifetime adjustment factors ($AF_{lifetime}$) applicable to surface waters designated Class 2A or 2Bd to calculate: CC_{dfr} or CS_{dfr} =

where: CC_{dfr} or CS_{dfr} = drinking water plus fish consumption and recreation chronic criterion or standard in µg/L
CR = cancer risk level or an additional excess cancer risk equal to 1×10^{-5} (1 in 100,000)
CSF = cancer potency slope factor in $(mg/kg\text{-}d)^{-1}$
$AF_{lifetime}$ = adjustment factor, lifetime (no units)
$DWIR_{lifetime}$ = drinking water intake rate for lifetime duration; drinking water intake rate for the lifetime duration based on a 95th percentile time-weighted average from MDH; rate may be chemical-specific with sufficient data or use default rate of 0.043 L/kg-d
Other variables as defined under item A

D. Algorithm for linear carcinogenic chemicals with age-dependent adjustment factors (ADAF) applicable to surface waters designated Class 2A or 2Bd to calculate: CC_{dfr} or CS_{dfr} =

where: CC_{dfr} or CS_{dfr} = drinking water plus fish consumption and recreation chronic criterion or standard in µg/L
ADAF = age-dependent adjustment factor by age groups
D = duration corresponding to the three age groups: birth up to two years of age (two-year duration), two years of age up to 16 years of age (14-year duration), and 16 years of age up to 70 years of age (54-year duration)
DWIR = drinking water intake rate for age groups; drinking water intake rate for the lifetime duration based on a 95th percentile time-weighted average from MDH; rate may be chemical-specific with sufficient data or use default rates for:
$DWIR_{0<2}$ = 0.137 L/kg-d, birth up to two years of age
$DWIR_{2 \text{ to } < 16}$ = 0.047 L/kg-d, two up to 16 years of age
$DWIR_{16 \text{ to } 70}$ = 0.039 L/kg-d, 16 up to 70 years of age
FCR = fish consumption intake rate by age groups:
$FCR_{0<2}$ = 0.00086 kg/kg-d
$FCR_{2 \text{ to } < 16}$ = 0.00055 kg/kg-d

$$\frac{CR\,(1 \times 10^{-5})}{CSF\,(mg/kg\text{-}d)^{-1} \times AF_{Lifetime}} \times \frac{1000\ \mu g/mg}{\{IWR_{chronic}\,(L/kg\text{-}d) + FCR_{Adult}\,(kg/kg\text{-}d)\left[(0.24 \times BAF_{TL3}\,(L/kg)) + (0.76 \times BAF_{TL4}(L/kg))\right]\}}$$

eria or standards for final chronic criteria for use based on the pollutant's toxicological profile: noncarcinogen or nonlinear carcinogen (NLC) or linear carcinogen (C).

$$\left\{\left\{CSF \times ADAF_{2\text{ to }16} \times D_{0\text{ to }2} \times [DWIR_{0\text{ to }2} + FCR_{0\text{ to }2} \times (0.24BAF_{TL3} + 0.76BAF_{TL4})]\right\} + \left\{CSF \times ADAF_{16\text{to}70} \times D_{16\text{to}70} \times [DWIR_{16\text{to}70} + FCR_{Adult} \times (0.24BAF_{TL3} + 0.76BAF_{TL4})]\right\}\right\} \times \frac{70\text{yrs}}{}$$

A. Algorithm for noncarcinogenic or NLC chemicals applicable to Class 2B, 2C, or 2D surface waters to calculate: CC_{fr} or CS_{fr} =

$$\frac{RfD_{chronic}\,(mg/kg\text{-}d) \times RSC\ (no\ units) \times 1{,}000\ \mu g/mg}{\{IWR_{chronic}\,(L/kg\text{-}d) + FCR_{adult}\,(kg/kg\text{-}d)[(0.24 \times BAF_{TL3}\,(L/kg)) + (0.76 \times BAF_{TL4}\,(L/kg)]\}}$$

where: CC_{fr} or CS_{fr} = fish consumption and recreation chronic criterion or standard in µg/L
$IWR_{chronic}$ = 0.0013 L/kg-d; assumed incidental water intake rate based on minimum chronic duration
Other variables as defined under subpart 13

B. Algorithm for linear carcinogenic chemicals with lifetime adjustment factors ($AF_{lifetime}$) applicable to surface waters designated Class 2B, 2C, or 2D to calculate: CC_{fr} or CS_{fr} =

where: CC_{fr} or CS_{fr} = fish consumption and recreation chronic criterion or standard in µg/L
Other variables as defined under item A and subpart 13

C. Algorithm for linear carcinogenic chemicals with age-dependent adjustment factors (ADAF) applicable to surface waters designated Class 2B, 2C, or 2D to calculate: CC_{fr} or CS_{fr} =

where: CC_{ft} or CS_{ft} = fish consumption and recreation chronic criterion or standard in µg/L
Other variables as defined under item A and subpart 13

Subp. 15. **Algorithms for Class 2 fish tissue.** This subpart describes algorithms and fish tissue criteria (CC_{ft}) and standards (CS_{ft}) for chemical with BAF greater than 1,000 (BCC threshold) applicable to Class 2 surface waters. Items A to C must be evaluated for use based on the pollutant's toxicological profile: noncarcinogen or nonlinear carcinogen (NLC) or linear carcinogen (C).

A. Algorithm for noncarcinogenic or NLC chemicals applicable to Class 2 surface waters to calculate: CC_{ft} or CS_{ft} =

$$\frac{RfD_{chronic}\text{ (mg/kg-d) x RSC (no units) or - RSC (mg/kg-d)}}{FCR_{adult}\text{ (kg/kg-d)}}$$

where: CC_{ft} or CS_{ft} = fish tissue-based chronic criterion or standard in mg/kg
Other variables as defined under subpart 13

B. Algorithm for linear carcinogenic chemicals with lifetime adjustment factors ($AF_{lifetime}$) applicable to Class 2 surface waters to calculate: CC_{ft} or CS_{ft} =

$$\frac{CR\ (1 \times 10^{-5})}{CSF\ (mg/kg\text{-}d)^{-1} \times AF_{lifetime}\text{ (no units)}} \times \frac{1}{FCR_{Adult}\text{ (kg/kg-d)}}$$

where: CC_{ft} or CS_{ft} = fish tissue-based chronic criterion or standard in mg/kg
Other variables as defined under subpart 13

C. Algorithm for linear carcinogenic chemicals with age-dependent adjustment factors (ADAFs) applicable to Class 2 surface waters to calculate: CC_{ft} or CS_{ft} =

where: CC_{ft} or CS_{ft} = fish tissue-based chronic criterion or standard in mg/kg
Other variables as defined under subpart 13

7050.0222 SPECIFIC WATER QUALITY STANDARDS FOR CLASS 2 WATERS OF THE STATE; AQUATIC LIFE AND RECREATION.

[For text of subps 1 to 6, see M.R.]

Subp. 7. **Additional standards; Class 2 waters.** The following additional standards and requirements apply to all Class 2 waters.

[For text of items A and B, see M.R.]

C. To prevent chronically toxic conditions, concentrations of toxic pollutants must not exceed the applicable CS or CC and MS or MC in surface waters outside allowable mixing zones as described in part 7050.0210, subpart 5. The CS or CC and MS or MC will be averaged over the following durations: the MS or MC will be a one-day average; the CS or CC, based on toxicity to aquatic life, will be a four-day average; and the CS or CC, based on human health and applied in water or wildlife toxicity, will be a 30-day average.

D. Concentrations of noncarcinogenic or nonlinear carcinogenic (NLC) chemicals in water or fish tissue from point or nonpoint sources, singly or in mixtures, must be below levels expected to produce known adverse effects. This is accomplished through the application of an additive noncancer health risk index using common health risk index endpoints or health endpoints. Mixtures of chemicals with listed CS or site-specific CC are evaluated using the following approach:

Chemicals must be grouped according to medium (water or fish) and each health endpoint. Chemicals for which no health endpoint is specified are not grouped. Chemicals that are also linear carcinogens must be grouped as described under item E. Using the following equation, a noncancer health risk index must be determined for each group of two or more chemicals that have a common health endpoint listed in this part. To meet the protection objectives in part 7050.0217, the noncancer health risk index must not exceed a value of one.

$$\text{Noncancer health risk index by common health endpoint} = \frac{C_1}{CS_1} + \frac{C_2}{CS_2} + \ldots + \frac{C_n}{CS_n} < 1$$

where: C_n is the concentration of the first to the n^{th} chemical by common health endpoint and medium

$CS_1 \ldots CS_n$ is the drinking water plus fish consumption and recreation chronic standard (CS_{dfr} or CS_{dev}), fish consumption and recreation chronic standard (CS_{fr}), or fish tissue chronic standard (CS_{ft}) for the first to n^{th} chemical by common health endpoint

$CC_1 \ldots CC_n$ is the drinking water plus fish consumption and recreation criterion (CC_{dfr} or CC_{dev}), fish consumption and recreation criterion (CC_{fr}), or fish tissue criterion (CC_{ft}) for the first to n^{th} chemical by common health endpoint

~~D.~~ E. Concentrations of carcinogenic chemicals from point or nonpoint sources, singly or in mixtures, ~~should~~ must not exceed ~~a~~ an incremental or additional excess risk level of one ~~chance~~ in 100,000 (10^{-5}) in surface waters or fish tissue. Carcinogenic chemicals will be considered additive in their effect according to the following equation unless an alternative model is supported by available scientific evidence. The additive equation applies to chemicals that have a human health-based standard calculated with a cancer potency slope factor. To meet the protection objectives in part 7050.0217, the cancer health risk index must not exceed a value of one.

~~$\frac{C_1}{CC_1} + \frac{C_2}{CC_2} + \ldots + \frac{C_n}{CC_n}$ equals a value of one or more, a risk level greater than 10^{-5} is indicated~~

$$\text{Cancer health risk index} = \frac{C_1}{CS_1} + \frac{C_2}{CS_2} + \ldots + \frac{C_n}{CS_n} < 1$$

where: $C_1 \ldots C_n$ is the concentration of the first to the n^{th} carcinogen~~.~~ in water or fish tissue

$CS_1 \ldots CS_n$ is the drinking water plus fish consumption and recreation chronic standard (CS_{dfr}), fish consumption and recreation chronic standard (CS_{fr}), or fish tissue chronic standard (CS_{ft}) for the first to n^{th} carcinogenic chemical

$CC_1 \ldots CC_n$ is the drinking water plus fish consumption criterion ~~(CC_{df}) or~~ (CC_{dfr}) fish consumption and recreation criterion (~~CC_f~~ CC_{fr}), or fish tissue criterion (CC_{ft}) for the first to n^{th} carcinogenic chemical~~.~~

F. When monitoring indicates that chemical breakdown products or environmental degradates are present in surface water or fish tissue, those products must be considered when meeting the objectives for toxic pollutants in part 7050.0217. When no human health-based CS or other MDH health-based guidance is available for the chemical breakdown product, the CS or CC for the parent chemical must be applied for that product. The parent CS or CC must also be applied to evaluate mixtures of chemicals.

~~E.~~ G. ~~The provisions of~~ This item ~~apply~~ applies to maximum standards (MS), final acute values (FAV), and double dashes (—) in this part and part 7050.0220 marked with an asterisk (*). For carcinogenic or highly bioaccumulative chemicals with BCFs greater than 5,000 or log K_{ow} values greater than 5.19, the human health-based chronic standard (CS) may be two or more orders of magnitude smaller than the acute toxicity-based MS. ~~If the commissioner finds that a very large MS and FAV, relative to the CS for such pollutants is not protective of the public health, the MS and FAV shall be reduced according to the following guidelines:~~

If the ratio of the MS to the CS is greater than 100, the CS times 100 ~~should~~ must be substituted for the applicable MS, and the CS times 200 ~~should~~ must be substituted for the applicable FAV. Any effluent limit derived using the procedures of this item ~~shall~~ must only be required after the discharger has been given notice of the specific proposed effluent limits and an opportunity to request a hearing as provided in part 7000.1800.

[For text of subps 8 and 9, see M.R.]

7052.0005 SCOPE.

A. This chapter establishes aquatic life, human health, and wildlife water quality standards and criteria for Great Lakes Initiative (GLI) pollutants; nondegradation standards for surface waters of the state in the Lake Superior Basin including, on a limited basis as described in item B, Class 7 waters; and implementation procedures for deriving effluent limitations from these standards and criteria. Other water quality standards, nondegradation standards, and implementation procedures applicable to the surface waters of the state in the Lake Superior Basin can be found in ~~chapters~~ chapter 7050 and ~~7065~~ in parts 7052.0100, subpart 1, items A to G, and 7053.0255.

[For text of item B, see M.R.]

7052.0010 DEFINITIONS.

[For text of subps 1 to 10, see M.R.]

Subp. 11. **Criterion.** "Criterion" means a number or numbers established for a pollutant derived under parts 7050.0218, 7050.0219, 7052.0110, or issued by the EPA, to protect aquatic life, humans, or wildlife.

[For text of subps 12 to 20, see M.R.]

Subp. 21. **GLI pollutant.** "GLI pollutant" means a toxic pollutant or chemical listed as a pollutant of initial focus in the GLI Guidance, Code of Federal Regulations, title 40, part 132, Table 6, as amended ~~through March 12, 1997~~.

[For text of subps 22 to 39, see M.R.]

Subp. 40. **Tier I.** "Tier I" means the methods referenced in part 7052.0110 for developing aquatic life~~, human health,~~ and wildlife standards or criteria.

Subp. 41. **Tier II.** "Tier II" means the methods referenced in part 7052.0110 for developing aquatic life ~~and human health~~ standards or criteria when there is not a set of data available that meets Tier I data requirements.

[For text of subps 42 to 45, see M.R.]

7052.0100 WATER QUALITY STANDARDS.

Subpart 1. **Applicability.**

A. The ambient water quality standards in subparts 2 to 6 are Class 2 standards for the protection of aquatic life, human health, and wildlife from the GLI pollutants. The numeric standard for a GLI pollutant includes the CS, MS, and FAV. Some pollutants do not have an MS or an FAV because of insufficient data. For these pollutants, the CS is the numeric standard. Additional standards applicable to the surface waters of the state in the Lake Superior Basin are found in ~~chapters~~ chapter 7050 ~~and 7065~~, including standards applicable to drinking water sources, which are listed in parts 7050.0220 and 7050.0221.

B. Some of the GLI pollutants listed in subparts 2 to 6 have both aquatic life and human health standards and four of the GLI pollutants have wildlife standards, as provided in tables 1 to 4 of the GLI Guidance. These standards are listed in subparts 2 to 6 to facilitate implementation of the standards under parts 7052.0200, subpart 3, and 7052.0210, subpart 1. The most stringent chronic aquatic life, human health, or wildlife standard listed is the applicable standard except when a less stringent chronic or maximum standard applies when setting an effluent limitation under part 7052.0200, subpart 3. For any aquatic life, human health, or wildlife chronic standard, a blank space in subparts 2 to 5 means no GLI standard is available and the most stringent listed chronic standard is applicable. For the aquatic life MS and FAV, blank spaces mean the GLI guidance lists no MS or FAV, and part 7050.0222 may contain an applicable MS or FAV.

C. The definitions and methods for human health-based chronic standards and site-specific chronic criteria in parts 7050.0217 to 7050.0219 are incorporated by reference and are further described in part 7052.0110, subpart 4.

D. The Class 2A human health-based chronic standards listed in chapter 7050 are incorporated by reference as modified by the procedures in part 7052.0110, subpart 3.

E. The Escherichia (E.) coli water quality standards in Code of Federal Regulations, title 40, section 131.41, Table (c)(1), that apply to coastal recreation waters are incorporated by reference as:

(1) E. coli bacteria must not exceed 126 organisms per 100 milliliters, as a geometric mean of not less than five samples representative of conditions during any calendar month; or

(2) E. coli bacteria must not exceed 235 organisms per 100 milliliters in more than ten percent of all the individual samples taken during any calendar month. The E. coli standard under this item applies only between April 1 and October 31.

F. Standards for metals are expressed as total metal but must be implemented as dissolved metal standards. Conversion factors for converting total to dissolved metal standards are listed in part 7052.0360, and applied under part 7052.0200, subpart 4. The conversion factor for metals not listed in part 7052.0360 is one. Standards for GLI pollutants followed by (TH) or (pH) vary with total hardness or pH. The formulas for these standards are found in subpart 6.

G. The CS and MS are averaged over the following durations:

(1) the MS is a one-day average;

(2) the CS, based on toxicity to aquatic life, is a four-day average; and

(3) the CS applied in water, based on human health or wildlife toxicity, is a 30-day average.

[For text of subps 2 to 6, see M.R.]

7052.0110 METHODOLOGIES FOR DEVELOPMENT OF ~~TIER I AND TIER II~~ STANDARDS AND CRITERIA, AND BIOACCUMULATION FACTORS.

Subpart 1. **Applicability.** This part identifies the methods that must be used to develop aquatic life and wildlife-based Tier I and Tier II standards and criteria and human health-based chronic standards and criteria. Subparts 3 and 4 also list exceptions to some of the assumptions used in the GLI Guidance methods. These exceptions are based on Minnesota-specific data.

[For text of subp 2, see M.R.]

Subp. 3. **Bioaccumulation factors.** Bioaccumulation factors (BAFs) for calculating human health and wildlife standards were developed and BAFs for calculating criteria must be developed using the methodology provided by Code of Federal Regulations, title 40, part 132, Appendix B, entitled "Great Lakes Water Quality Methodology for Deriving Bioaccumulation Factors," as amended through March 12, 1997, which is adopted and incorporated by reference in part 7052.0015, item B, except that for human health standards and criteria, the baseline BAF is multiplied by the following lipid fractions which apply to fish in both trophic levels 3 (TL_3) and 4 (TL_4), except as noted in item C:

A. 0.085 for Lake Superior;

B. 0.06 for Class 2A waters other than Lake Superior; and

C. 0.015 for TL_4 and 0.020 for TL_3 for Class 2B, 2Bd, 2C, and 2D waters.

Subp. 4. **Human health.**

A. ~~All Tier I and Tier II~~ Human health standards listed in part 7052.0100 for benzene, chlordane, chlorobenzene, cyanide (free), DDT, dieldrin, 2,4-dimethylphenol, 2,4-dinitrophenol, hexachlorobenzene, hexachloroethane, lindane, mercury (total), methylene chloride, PCBs, 2,3,7,8-TCDD, toluene, and trichloroethylene were developed ~~and all criteria must be developed~~ using the Tier I methodology provided by Code of Federal Regulations, title 40, part 132, Appendix C, entitled "Great Lakes Water Quality Initiative Methodology for Development of Human Health Criteria and Values," as amended through March 12, 1997, which is adopted and incorporated by reference in part 7052.0015, item C, except that the daily human consumption of fish caught in the Lake Superior Basin is assumed to be 0.030 kg/day (0.0072 kg/day for ~~trophic level 3~~ TL_3 fish plus 0.0228 kg/day for ~~trophic level 4~~ TL_4 fish).

B. Changes to the standards established for the pollutants in item A or additional human health-based chronic standards or site-specific chronic criteria must be based on the algorithms and methods in parts 7050.0217 to 7050.0219, with site-specific consideration as provided in part 7052.0270, except the bioaccumulation factor methods in part 7052.0110, subpart 3, must be used in place of those listed in part 7050.0219, subpart 6.

C. Concentrations of noncarcinogenic or nonlinear carcinogenic (NLC) chemicals in water or fish tissue from point or nonpoint sources, singly or in mixtures, must be below levels expected to produce known adverse effects. This is accomplished through the application of an additive noncancer health risk index using common health risk index endpoints or health endpoints as described in part 7050.0222, subpart 7, item D. Concentrations of carcinogenic chemicals from point or nonpoint sources, singly or in mixtures, must not exceed an incremental or additional excess risk level of one in 100,000 (10^{-5}) in surface waters. The combined risk from mixtures of linear carcinogens (C) is determined as described in part 7050.0222, subpart 7, item E.

[For text of subp 5, see M.R.]

7052.0220 REASONABLE POTENTIAL FOR CHEMICAL-SPECIFIC WQBELS.

[For text of subp 1, see M.R.]

Subp. 2. **Developing preliminary effluent limitations.** The first step in a reasonable potential determination is to calculate a PEL. The procedures in parts 7052.0200 and 7052.0210 must be used to determine a PEL from a ~~Tier I or Tier II~~ standard or criterion. If the agency determines that there are insufficient data to calculate a standard or criterion, the procedure in subpart 4 must be followed to determine if data must be generated to calculate a ~~Tier II~~ standard or site-specific criterion.

[For text of subp 3, see M.R.]

Subp. 4. **Developing data for calculating Tier II ~~noncancer human health and~~ aquatic life standards and criteria or noncancer human health-based standards or site-specific criteria.** This subpart applies when the agency determines that insufficient data currently exist to calculate aquatic life toxicity-based Tier II or human health-based standards or criteria for GLI pollutants known to be in the discharge, or suspected to be in the discharge based on knowledge of the raw materials used or internal process or waste streams.

[For text of item A, see M.R.]

B. Using the provisions in parts 7052.0200 and 7052.0210, the agency must develop PELs based on the estimated ambient screening criteria and compare the PELs with each PEQ developed under subpart 3. If the PEQ exceeds the PEL for any GLI pollutant, the agency must generate or require the permittee to generate the data necessary to derive ~~Tier II~~ standards or site-specific criteria to protect human health from noncancer effects and aquatic life from acute and chronic effects using the methods in part 7052.0110 with site-specific consideration as provided in part 7052.0270.

C. The agency must use the data generated according to item B to calculate ~~Tier II~~ standards and site-specific criteria according to the methods in part 7052.0110. The derived ~~Tier II~~ standards and criteria must be used to calculate PELs to determine if an effluent limitation must be established in the permit. If the PEQ exceeds the PEL for any GLI pollutant, an effluent limitation must be established in the permit.

[For text of item D, see M.R.]

[For text of subps 5 to 7, see M.R.]

7052.0230 ADDITIVITY.

[For text of subp 1, see M.R.]

Subp. 2. **Carcinogenic human health GLI pollutant additivity.** The agency must calculate the additive effects of carcinogenic human health pollutants in effluents according to part 7050.0222, subpart 7, item ~~D~~ E, for which individual WQBELs have been established under part 7052.0200, subpart 5. Cumulative incremental risk for carcinogens in the effluent must be maintained at 1×10^{-5} or less.

Subp. 3. **Noncarcinogenic human health GLI pollutant additivity.** The agency must determine the additive effects of noncarcinogenic human health pollutants where individual WQBELs have been established under part 7052.0200, subpart 5, and where the pollutants exhibit the same adverse effects through the same mechanisms of action as established through the use of health risk index endpoints or health endpoints according to part 7050.0222, subpart 7, item D.

[For text of subps 4 and 5, see M.R.]

REPEALER. *Minnesota Rules*, part 7050.0218, subparts 6 and 7, are repealed.

Adopted Rules

A rule becomes effective after the requirements of *Minnesota Statutes* §§ 14.05-14.28 have been met and five working days after the rule is published in the *State Register*, unless a later date is required by statutes or specified in the rule. If an adopted rule is identical to its proposed form as previously published, a notice of adoption and a citation to its previous *State Register* publication will be printed. If an adopted rule differs from its proposed form, language which has been deleted will be printed with strikeouts and new language will be underlined. The rule's previous *State Register* publication will be cited.

KEY: Proposed Rules - Underlining indicates additions to existing rule language. ~~Strikeouts~~ indicate deletions from existing rule language. If a proposed rule is totally new, it is designated "all new material." **Adopted Rules** - Underlining indicates additions to proposed rule language. ~~Strikeout~~ indicates deletions from proposed rule language.

Board of Electricity

Adopted Permanent Rules Adopting the 2014 National Electrical Code

The rules proposed and published at *State Register*, Volume 38, Number 34, pages 1103-1105, February 18, 2014 (38 SR 1103), are adopted as proposed.

Board of Electricity

Adopted Permanent Rules Relating to Satellite System Installers Continuing Education Requirements and Satellite System Installer Certification Programs

The rules proposed and published at *State Register*, Volume 38, Number 37, pages 1185-1190, March 10, 2014 (38 SR 1185), are adopted as proposed.

Executive Orders

The governor has the authority to issue written statements or orders, called Executive Orders. as well as Emergency Executive Orders. The governor's authority is specified in the *Constitution of the State of Minnesota*, Article V, and in *Minnesota Statutes* § 4.035. Emergency Executive Orders, for protection from an imminent threat to health and safety, become effective immediately, are filed with the secretary of state, and published in the *State Register* as soon as possible after they are issued. Other Executive Orders become effective 15 days after publication in the *State Register* and filing with the secretary of state. Unless otherwise specified, an executive order expires 90 days after the date the governor who issued the order vacates office.

Office of the Governor

Emergency Executive Order 14-10: Providing for Personnel and Equipment for the Prairie Island Nuclear Generating Plant Drill and Exercise, St. Cloud Reception Center Drill and Exercise, Wabasha Reception Center Drill, Cottage Grove Reception Center Drill, Rogers Reception Center Drill, and Princeton Reception Center Drill

I, MARK DAYTON, GOVERNOR OF THE STATE OF MINNESOTA, by virtue of the authority vested in me by the Constitution and applicable statutes, do hereby issue this Executive Order:

WHEREAS, the Minnesota Department of Public Safety, Division of Homeland Security and Emergency Management, has requested assistance in providing personnel and equipment to support the Prairie Island Nuclear Generating Plant Drill and Exercise, St. Cloud Reception Center Drill and Exercise, Wabasha Reception Center Drill, Cottage Grove Reception Center Drill, Rogers Reception Center Drill, and Princeton Reception Center Drill; and

WHEREAS, adequate personnel and equipment are not available from the Department of Public Safety, other participating agencies, Dakota and Goodhue Counties of Minnesota, and other local authorities;

NOW, THEREFORE, I hereby order that:

1. The Adjutant General of Minnesota orders to state active duty on or about June 19, 2014, in the service of the State, such personnel and equipment of the military forces of the State needed by the Department of Human Services to successfully complete the Wabasha Reception Center Drill.

2. The Adjutant General of Minnesota orders to state active duty on or about June 24, 2014, in the service of the State, such personnel and equipment of the military forces of the State needed by the Department of Public Safety and Dakota and Goodhue Counties to successfully complete the Prairie Island Nuclear Generating Plant Drill.

3. The Adjutant General of Minnesota orders to state active duty on or about June 25, 2014, in the service of the State, such personnel and equipment of the military forces of the State needed by the Department of Human Services to successfully complete the Cottage Grove Reception Center Drill.

4. The Adjutant General of Minnesota orders to state active duty on or about July 8, 2014, in the service of the State, such personnel and equipment of the military forces of the State needed by the Department of Human Services to successfully complete the St. Cloud Reception Center Drill.

5. The Adjutant General of Minnesota orders to state active duty on or about July 22, 2014, in the service of the State, such personnel and equipment of the military forces of the State needed by the Department of Human Services to successfully complete the Rogers Reception Center Drill.

6. The Adjutant General of Minnesota orders to state active duty on or about July 29, 2014, in the service of the State, such personnel and equipment of the military forces of the State needed by the Department of Public Safety, and Dakota and Goodhue Counties to successfully complete the Prairie Island Nuclear Generating Plant Exercise.

7. The Adjutant General of Minnesota orders to state active duty on or about July 29, 2014, in the service of the State,

such personnel and equipment of the military forces of the State needed by the Department of Human Services to successfully complete the St. Cloud Reception Center Exercise.

8. The Adjutant General of Minnesota orders to state active duty on or about August 19, 2014, in the service of the State, such personnel and equipment of the military forces of the State needed by the Department of Human Services to successfully complete the Princeton Reception Center Drill.

9. The cost of subsistence, transportation, fuel, pay, and allowances of said individuals shall be paid by the Department of Public Safety, Division of Homeland Security and Emergency Management, as provided by the Military Affairs 2014 and 2015 Radiological Emergency Preparedness grant.

Pursuant to Minnesota Statutes, Section 4.035, Subdivision 2, this emergency executive order is effective immediately and will remain in effect until the conclusion of the Prairie Island Nuclear Generating Plant Drill and Exercise, St. Cloud Reception Center Drill and Exercise, Wabasha Reception Center Drill, Cottage Grove Reception Center Drill, Rogers Reception Center Drill, and Princeton Reception Center Drill activities.

IN TESTIMONY WHEREOF, I have set my hand on this 11th day of June, 2014.

Signed: **Mark Dayton**
Governor

Filed According to Law

Signed: Mark Ritchie
Secretary of State

Official Notices

Pursuant to *Minnesota Statutes* §§ 14.101, an agency must first solicit comments from the public on the subject matter of a possible rulemaking proposal under active consideration within the agency by publishing a notice in the *State Register* at least 60 days before publication of a notice to adopt or a notice of hearing, and within 60 days of the effective date of any new statutory grant of required rulemaking.

The *State Register* also publishes other official notices of state agencies and non-state agencies, including notices of meetings and matters of public interest.

Minnesota State Colleges and Universities (MnSCU)
State Department of Administration (Admin)
State Designer Selection Board Project No. 14-05
Notice of Availability of Request for Proposal (RFP) for Designer Selection for Central Lakes College, Staples - Campus Renovation

The State of Minnesota, acting through its Board of Trustees of the Minnesota State Colleges and Universities, on behalf of Central Lakes College, through the State Designer Selection Board, is soliciting proposals from interested, qualified consultants for architectural and engineering design services for the above referenced project.

A full Request for Proposals is available on the Minnesota Department of Administration's website at ***http://mn.gov/admin/government/construction-projects/sdsb/sdsb-projects.jsp*** (click 14-05).

A **MANDATORY** informational meeting is scheduled for **Tuesday June 24, 2014 at 11:00 AM** Central Time at Central Lakes College, Staples Campus, room B103, 1830 Airport Road, Staples, MN 56479

Any questions should be directed by email only, to Kari Christiansen at ***kchristi@clcmn.edu***. Project questions will be taken by this individual only. Questions regarding this RFP must be received by **Thursday, June 26, 2014** no later than **4:00 PM** Central Time.

Proposals must be delivered to Talia Landucci Owen, Executive Secretary, State Designer Selection Board, Real Estate and Construction Services, Room 309, Administration Building, 50 Sherburne Ave., St. Paul, MN 55155, **phone:** (651) 201-2372 not later than **12:00 noon on Tuesday, July 8, 2014.** Late responses will not be considered.

Minnesota State Colleges and Universities is not obligated to complete the proposed project and reserves the right to cancel the solicitation if it is considered to be in its best interest.

Minnesota Department of Employment and Economic Development (DEED)
Vocational Rehabilitation Services, Extended Employment Program
REQUEST FOR COMMENTS on Possible Amendment to Rules Governing Extended Employment Services Authorized in MN Statute 268A.15; *Minnesota Rules:* 3300.2005 – 3300.2055; Revisor's ID Number R-04245

Subject of Rules. The Minnesota Department of Employment and Economic Development requests comments on possible amendments to the Extended Employment Program and Funding Rules. The Department is considering rules amendments and changes that align the services and outcomes of the Extended Employment program to meet the objectives contained in Minnesota's Olmstead plan. Specifically, the amendments would seek to 1) align services and outcomes with support services that meet federal standards for Vocational Rehabilitation; 2) align services and outcomes with support services that meet federal standards for Medicaid-funded employment services; 3) set standards for eligible employment support services; 4) realign payments made to providers to support desired outcomes;

and 5) eliminate archaic language and consider other items that may be relevant to agency policies if time is available.

Persons Affected. The amendment to the rules would likely affect persons with significant disabilities who currently receive, or will in the future receive, ongoing, long-term employment supports; families or guardians of those receiving services; and community rehabilitation providers who deliver long-term employment supports. Other groups or organizations that may be affected include organizations advocating for persons with disabilities, state agencies, county social service agencies, and workforce development programs.

Statutory Authority. *Minnesota Statutes*, 268A.15
*Subd. 3.**Rule authority.***
The commissioner shall adopt rules on an individual's eligibility for the extended employment program, the certification of rehabilitation facilities, and the methods, criteria, and units of distribution for the allocation of state grant funds to certified rehabilitation facilities. In determining the allocation, the commissioner must consider the economic conditions of the community and the performance of rehabilitation facilities relative to their impact on the economic status of workers in the extended employment program.

Public Comment. Individuals or groups with an interest in the possible rule changes may submit their comments or information in writing until notice is published in the *State Register* that the Department intends to adopt or withdraw the rules. The Department will not publish a notice of intent to adopt the rules until at least 60 days have elapsed from the date of this request for comments.

The Department requests comments on the cumulative effect of the rule with other federal and state regulations.

The Department will select and appoint members of an advisory committee to comment on the possible rules. The Department will accept requests to serve on the advisory committee. Membership may include, but is not necessarily limited to: representatives from community rehabilitation programs, persons receiving extended employment supports, advocacy organizations representing persons with disabilities, state agencies, and county social service agencies. It is anticipated that the advisory committee will begin meeting within one month of this announcement and will meet biweekly in Saint Paul. There may be public hearings outside Saint Paul which coincide with meetings of the advisory committee. The committee will review current and historic performance of the extended employment program, the recommendations contained in the state Olmstead plan, and draft rule language. The committee will operate throughout the period reserved for comments and may continue to meet during the adoption period of any amendments to the rule

Rules Drafts. The Department has not yet drafted possible amendments.

Agency Contact Person. Written comments, questions, requests to receive a draft of the rules when it has been prepared], and requests for more information on these possible rules should be directed to: John Sherman, Vocational Rehabilitation Services, 332 Minnesota Street, Suite E200, Saint Paul, MN 55101. **Phone:** (651) 259-7349, **toll-free:** 1-800-328-9095. **fax:** (651) 297-5159. **e-mail:** ***john.sherman@state.mn.us***.

Alternative Format. Upon request, this information can be made available in an alternative format, such as large print, braille, or audio. To make such a request, please contact the agency contact person at the address or telephone number listed above.

NOTE: Comments received in response to this notice will not necessarily be included in the formal rulemaking record submitted to the administrative law judge if and when a proceeding to adopt rules is started. The agency is required to submit to the judge only those written comments received in response to the rules after they are proposed. If you submitted comments during the development of the rules and you want to ensure that the Administrative Law Judge reviews the comments, you should resubmit the comments after the rules are formally proposed.

Dated: [???]

Commissioner, Katie Sieben Clark
Department of Employment and
Economic Development

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Official Notices

Minnesota Pollution Control Agency (MPCA)

Watershed Division

Notice of Availability of Draft Lower Mississippi River Watershed Management Organization (LMRWMO) WRAPS/TMDL Report and Request for Comment

Public Notice Period Begins: **June 16, 2014**
Public Notice Period Ends: **July 16, 2014**

The Minnesota Pollution Control Agency (MPCA) is requesting comments on the draft Lower Mississippi River Watershed Management Organization (LMRWMO) Watershed Restoration and Protection Strategy (WRAPS)/Total Maximum Daily Load (TMDL) Report (Report). The draft Report is available for review at: ***http://www.pca.state.mn.us/4f4p4xc***.

Following the comments, the MPCA will revise the draft WRAPS/TMDL Report and submit it to the U.S. Environmental Protection Agency (EPA) for approval. Comments must be sent to the MPCA contact person listed below by 4:30 p.m. on July 16, 2014.

Required by the federal Clean Water Act, a TMDL is a scientific study that calculates the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards for that pollutant. It is a process that identifies all the sources of the pollutant causing an impairment and allocates necessary reductions among them. This multi-year effort results in a pollution reduction plan and engages stakeholders and the general public. An approved TMDL is followed by implementation activities for achieving the necessary reductions.

The LMRWMO WRAPS/TMDL Report describes nutrient reductions needed for Thompson, Augusta, and Sunfish Lakes to meet state water quality standards. The Report includes implementation strategies to reduce nutrient inputs, and recommendations to conduct additional water quality monitoring in Pickerel Lake. The Report also describes protection strategies needed to maintain high water quality in Rogers Lake, which is currently meeting state water quality standards. Sunfish and Augusta Lakes were listed on the 303(d) list of impaired waters in 2010 and Thompson and Pickerel Lakes were listed in 2014. Land uses in the watersheds of the impaired lakes are variable, but include commercial, high and low density residential, institutional (cemeteries), undeveloped, and park and recreational areas. To meet the water quality standard, excess phosphorus will need to be reduced by 22% to 64% for the lakes. Sources of phosphorus in the lakes are from organic material such as leaves and grass clippings, sediments often transported by stormwater, and the internal loading of phosphorus from lake sediments. Flood waters from the Mississippi River and bluff and ravine erosion also contribute phosphorus to Pickerel Lake.

Agency Contact Person: Written or oral comments, petitions, questions, or requests to receive a draft of the WRAPS/TMDL Report, and requests for more information should be directed to:

Barb Peichel
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194
Telephone: (651) 757-2646
Minnesota Toll Free: 1-800-657-3864
Fax: (651) 297-8676
E-mail: ***Barbara.Peichel@state.mn.us***
TTY users may call the MPCA teletypewriter at (651) 282-5332 or 1-800-657-3864.

Preliminary Determination on the Draft WRAPS/TMDL Report: The MPCA Commissioner has made a preliminary determination to submit this draft WRAPS/TMDL Report to the EPA for final approval. A draft WRAPS/TMDL Report is available for review at the MPCA office at the address listed above, and at the MPCA website: ***http://www.pca.state.mn.us/0agxa04.***

Suggested changes will be considered before the final WRAPS/TMDL Report is sent to the EPA for approval.

Written Comments: You may submit written comments on the conditions of the draft WRAPS/ TMDL Report or on the Commissioner's preliminary determination.

Written comments must include the following:

1. A statement of your interest in the draft WRAPS/TMDL Report;
2. A statement of the action you wish the MPCA to take, including specific references to sections of the draft WRAPS/TMDL Report that you believe should be changed; and
3. The reasons supporting your position, stated with sufficient specificity as to allow the Commissioner to investigate the merits of your position.

Petition for Public Informational Meeting: You also may request that the MPCA Commissioner hold a public informational meeting. A public informational meeting is an informal meeting that the MPCA may hold to solicit public comment and statements on matters before the MPCA, and to help clarify and resolve issues.

A petition requesting a public informational meeting must include the following information:

1. A statement identifying the matter of concern;
2. The information required under items 1 through 3 of "Written Comments," identified above;
3. A statement of the reasons the MPCA should hold a public informational meeting; and
4. The issues that you would like the MPCA to address at the public informational meeting.

Petition for Contested Case Hearing: You also may submit a petition for a contested case hearing. A contested case hearing is a formal evidentiary hearing before an administrative law judge. In accordance with *Minnesota Rules* 7000.1900, the MPCA will grant a petition to hold a contested case hearing if it finds that: (1) there is a material issue of fact in dispute concerning the application or draft WRAPS/TMDL Report; (2) the MPCA has the jurisdiction to make a determination on the disputed material issue of fact; and (3) there is a reasonable basis underlying the disputed material issue of fact or facts such that the holding of the contested case hearing would allow the introduction of information that would aid the MPCA in resolving the disputed facts in making a final decision on the draft WRAPS/TMDL Report. A material issue of fact means a fact question, as distinguished from a policy question, whose resolution could have a direct bearing on a final MPCA decision.

A petition for a contested case hearing must include the following information:

1. A statement of reasons or proposed findings supporting the MPCA decision to hold a contested case hearing according to the criteria in *Minnesota Rules* 7000.1900, as discussed above; and
2. A statement of the issues proposed to be addressed by a contested case hearing and the specific relief requested or resolution of the matter.

In addition and to the extent known, a petition for a contested case hearing should also include the following information:

1. A proposed list of prospective witnesses to be called, including experts, with a brief description of proposed testimony or summary of evidence to be presented at a contested case hearing;
2. A proposed list of publications, references, or studies to be introduced and relied upon at a contested case hearing; and
3. An estimate of time required for you to present the matter at a contested case hearing.

The MPCA Decision: You may submit a petition to the Commissioner requesting that the MPCA Citizens' Board (Board) consider the WRAPS/TDML Report approval. To be considered timely, the petition must be received by the MPCA by 4:30 p.m. on the date the public comment period ends, identified on page 1 of this notice. Under the provisions of *Minnesota Statutes* § 116.02, subd 6(4), the decision whether to submit the WRAPS/TMDL Report and, if so, under what terms will be presented to the Board for decision if:

1. The Commissioner grants the petition requesting the matter be presented to the Board;
2. One or more Board members request to hear the matter before the time the Commissioner makes a final decision on the WRAPS/TMDL Report; or
3. A timely request for a contested case hearing is pending. You may participate in the activities of the MPCA Board as provided in *Minnesota Rules* 7000.0650.

The written comments, requests, and petitions submitted on or before the last day of the public comment period will be considered in the final decision on this WRAPS/TMDL Report. If the MPCA does not receive written comments, requests, or petitions during the public comment period, the MPCA staff as authorized by the Board, will make the final decision on the draft WRAPS/TMDL Report.

Dated: June, 2014

Official Notices

Minnesota Sentencing Guidelines Commission

Notice of Public Hearing to Consider Modifications to the Sentencing Guidelines

The Minnesota Sentencing Guidelines Commission will hold a public hearing on Thursday, July 17, 2014, at 2:00 p.m. in Room 112, at the State Capitol Building, 75 Rev. Dr. Martin Luther King Jr. Blvd., St. Paul, MN 55155. The public hearing is being held to consider proposed modifications to the Sentencing Guidelines and Commentary resulting from new and amended legislation and non-legislative modifications.

Copies of the proposed modifications are available free of charge on the agency's website at ***mn.gov/sentencing-guidelines***, or by contacting the Minnesota Sentencing Guidelines Commission by mail at 309 Administration Building, 50 Sherburne Avenue, St. Paul, MN 55155, or by **telephone:** (651) 296-0144. Deaf/Hard of Hearing/Speech Impaired Only **TTY** users may call this agency through the MN Relay Service: 1 (800) 627-3529; ask for (651) 296-0144. If you need special accommodations to attend, please contact the Minnesota Sentencing Guidelines Commission as soon as possible. This notice is available in alternative formats upon request.

All interested persons are encouraged to attend the hearing and offer comments. Persons wishing to speak may register in advance by contacting the Commission's office at the above address or telephone number, or by e-mail at ***sentencing.guidelines@state.mn.us***.

The Commission will hold the record open for five days after the public hearing to accept written comment. On Thursday, July 24, 2014, the Commission will meet at 2:00 p.m. at the Administration Building, 50 Sherburne Avenue, Room 116C, St. Paul, MN 55155, to formally adopt or reject the proposed modifications. Modifications become effective August 1, 2014, if adopted.

Minnesota Department of Transportation (Mn/DOT)

Notice to Bidders: Suspensions/Debarments as of June 9, 2014

NOTICE OF SUSPENION

NOTICE IS HEREBY GIVEN that MnDOT has ordered that the following vendors be suspended effective May 15, 2014, until July 15, 2014:

- GCC Alliance Concrete, Inc., Minneapolis, MN

NOTICE OF DEBARMENT

NOTICE IS HEREBY GIVEN that MnDOT has ordered that the following vendors be debarred for a period of three (3) years, effective May 6, 2013 until May 6, 2016:

- Gary Francis Bauerly and his affiliates, Rice, MN
- Gary Bauerly, LLC and its affiliates, Rice, MN
- Watab Hauling Co. and its affiliates, Rice, MN

Minnesota Statute section 161.315 prohibits the Commissioner, counties, towns, or home rule or statutory cities from awarding or approving the award of a contract for goods or services to a person who is suspended or debarred, including:

1) any contract under which a debarred or suspended person will serve as a subcontractor or material supplier,
2) any business or affiliate which the debarred or suspended person exercises substantial influence or control, and
3) any business or entity, which is sold or transferred by a debarred person to a relative or any other party over whose actions the debarred person exercises substantial influence or control, remains ineligible during the duration of the seller's or transfer's debarment.

State Grants & Loans

In addition to requests by state agencies for technical/professional services (published in the State Contracts Section), the *State Register* also publishes notices about grants and loans available through any agency or branch of state government. Although some grant and loan programs specifically require printing in a statewide publication such as the *State Register*, there is no requirement for publication in the *State Register* itself. Agencies are encouraged to publish grant and loan notices, and to provide financial estimates as well as sufficient time for interested parties to respond.

SEE ALSO: Office of Grants Management (OGM) at: *http://www.grants.state.mn.us/public/*

Minnesota Department of Human Services (DHS)

Transition to Economic Stability Division

Notice of Request for Proposals to Develop and Implement Subsidized Employment Strategies and Address Racial and Ethnic Disparities in Employment Outcomes for Families Served by the Minnesota Family Investment Program (MFIP)

NOTICE IS HEREBY GIVEN that the Minnesota Department of Human Services is requesting proposals in support of two initiatives designed to result in higher number of adults securing sustained jobs through the MFIP program as part of its Grant Program scheduled to begin October 1, 2014.

Work is proposed to start October 1, 2014. For more information, or to obtain a copy of the Request for Proposal, contact:

Erika Nicholson
Department of Human Services
Transition to Economic Stability Division
P.O. Box 64951
444 Lafayette Road North
St. Paul, MN 55155-0951
Phone: (651) 431-3992
Fax: (651) 431-7526
E-mail: ***Erika.Nicholson@state.mn.us***

This is the only person designated to answer questions by potential responders regarding this request.

Proposals submitted in response to this Request for Proposals must be received at the address above no later than **4:00 p.m., Central Time, July 21, 2014. Late proposals will NOT be considered.** Faxed or e-mailed proposals will **NOT** be considered.

The RFP can be viewed by visiting the Minnesota Department of Human Services RFP web site:

http://www.dhs.state.mn.us/main/id_000102

This request does not obligate the State to complete the work contemplated in this notice. The State reserves the right to cancel this solicitation. All expenses incurred in responding to this notice are solely the responsibility of the responder.

State Contracts

In addition to the following listing of state contracts, readers are advised to check the Statewide Integrated Financial Tools (SWIFT) Supplier Portal at: *http://supplier.swift.state.mn.us as well as the Office of Grants Management (OGM) at: http://www.grants.state.mn.us/public/*

Informal Solicitations: Informal soliciations for professional/technical (consultant) contracts valued at over $5,000 through $50,000, may either be advertised in the Supplier Portal (see link above) or posted on the Department of Administration, Materials Management Division's (MMD) Web site at: *http://www.mmd.admin.state.mn.us/solicitations.htm*.

Formal Solicitations: Department of Administration procedures require that formal soliciations (announcements for contracts with an estimated value over $50,000) for professional/technical contracts must be advertised in the SWIFT Supplier Portal or alternatively, in the *Minnesota State Register* if the procuments is not being conducted in the SWFT system.

Minnesota State Colleges and Universities (MnSCU)

Lake Superior College

Request for Bids for WaterJet Cutting Machine

NOTICE IS HEREBY GIVEN that bids are being solicited for a WaterJet Cutting Machine. High Pressure Pump and components, XYZ base, software, controls, and abrasive feed system must all be manufactured by the same single source supplier OEM - Original Equipment Manufacturer.

For additional information or to request a copy of the Request for Bids, please contact:

Michelle Phernetton, Purchasing
Lake Superior College
2101 Trinity Rd, Duluth MN 55811
Telephone: (218) 733-5976
Fax: (218) 733-5977
E-mail: ***purchasing@lsc.edu***

Proposals are due at the Lake Superior College Business Office by 4:00 PM CST on Monday, June 30th, 2014.

This notice and the Request for Proposal do not obligate the State of Minnesota, Minnesota State Colleges and Universities or Lake Superior College to award a contract; and reserves its right to withdraw from the RFP if it is considered to be in its best interest.

Minnesota State Colleges and Universities (MnSCU)

Lake Superior College

Request for Proposal for Food Service

NOTICE IS HEREBY GIVEN that proposals are being solicited for Pricing and Service for Cafeteria Food Supplies and Sundries for the in-house Cafeteria Food Service at Lake Superior College located in Duluth, Minnesota.

Lake Superior College seeks to enter into an agreement for the upcoming school year, August 1, 2014 through June 30, 2015. For additional information or to request a copy of the Request for Proposal, please contact:

Michelle Phernetton, Purchasing
Lake Superior College
2101 Trinity Rd, Duluth MN 55811
Telephone: (218) 733-5976
Fax: (218) 733-5977
E-mail: ***purchasing@lsc.edu***

Proposals are due at the Lake Superior College Business Office by 4:00 PM CT on Monday, June 30, 2014.

This notice and the Request for Proposal do not obligate the State of Minnesota, Minnesota State Colleges and Universities or Lake Superior College to award a contract; and reserves its right to withdraw from the RFP if it is considered to be in its best interest.

Minnesota State Colleges and Universities (MnSCU)

Lake Superior College

Request for Proposal for Third Party Evaluation Services

NOTICE IS HEREBY GIVEN that proposals are being solicited for consultants experienced and qualified to provide third party evaluation services to assist the College in applying for the US Department of Labor Trade Adjustment Assistance Community College and Career Training (TAACCCT) program grant; the grant proposal is due July 7, 2014.

For additional information or to request a copy of the Request for Proposal, please contact:

Michelle Phernetton, Purchasing
Lake Superior College
2101 Trinity Rd, Duluth MN 55811
Telephone: (218) 733-5976
Fax: (218) 733-5977
E-mail: ***purchasing@lsc.edu***

Proposals are due at the Lake Superior College Business Office by 11:00 AM CST on Monday, June 30, 2014.

This notice and the Request for Proposal do not obligate the State of Minnesota, Minnesota State Colleges and Universities or Lake Superior College to award a contract; and reserves its right to withdraw from the RFP if it is considered to be in its best interest.

Minnesota Historical Society (MHS)

Request for Bids for Oliver Hudson Kelley Farm – Barn Foundation Restoration Elk River, Minnesota

The Minnesota Historical Society (the Society) is seeking bids from qualified firms to provide all labor, materials, equipment, and supplies for barn foundation restoration at the Oliver Hudson Kelly Farm. Work will be accomplished in accordance with the Technical Specifications, Instructions to Bidders, and Contract Documents (i.e., Supplementary Conditions, General Conditions, Contract Terms), as well as this Request for Bids.

Request for Bids are available by emailing Mary Green Toussaint, Acting Contracting Officer at ***mary.green-toussaint@mnhs.org***

There will be a **MANDATORY** pre-bid meeting for all interested parties on **Wednesday**, **June 25, 2014, at 3:00 p.m. Local Time** at the farm: 15788 Kelly Farm Road NW, Elk River, MN 55330.

All bids must be received by Mary Green Toussaint, Acting Contracting Officer, Minnesota Historical Society, 345 Kellogg Boulevard West, St. Paul, Minnesota 55102, or her authorized agent no later than **2:00 p.m. Local Time Wednesday, July 9, 2014**. "Authorized agent" means the receptionist at the 1st Floor Information Desk. A public bid opening will be conducted at that time.

State Contracts

Minnesota Historical Society (MHS)
(on behalf of the Minnesota Historical Society Press/Borealis Books)
Request for a Printing Estimate Millet's Minnesota's Own

The Minnesota Historical Society, dba Minnesota Historical Society Press/Borealis Books (MHS Press), is seeking bids for printing the book entitled *Minnesota's Own* - **jacked hardcover .**

Detailed specifications follow. Please read them carefully, comply with them fully, and make sure the attached bid price form is filled out accurately and signed.

PLEASE NOTE: MHS Press requires complete, no-surprise bids and reserves the right to reject bids that do not address the following information:

- number of pages per signature you plan for this job
- approximate number of days this job will be in your plant, from receipt of files to bound-book date
- all shipping costs, from printer's dock to the Chicago Distribution Center (CDC) warehouse, including all customs fees and domestic transport costs. (Printer must pay all such fees and bill them to MHS Press on final invoice.)

Specifications are available by email to Mary Green Toussaint, Acting Contracting Officer at ***mary.green-toussaint@mnhs.org***

If you have any questions, comments, or suggestions, please contact Daniel Leary, MHS Press Print Production Manager, via e-mail at ***daniel.leary@mnhs.org***.

Sealed bid estimates must be received by Mary Green Toussaint, Acting Contracting Officer, Minnesota Historical Society, 345 Kellogg Boulevard West, Saint Paul, Minnesota 55102-1906 by **Tuesday, July 1, 2014 at 2 p.m. Local Time**. Late bids will **NOT** be accepted.

Minnesota Historical Society (MHS)
and the Oversight Board of the Statewide Survey of Historical and Archaeological Sites
Request for Proposals for Investigating Poorly Known Historic Contexts: The Archaic Tradition in Central Minnesota

The Minnesota Historical Society (Society) and the Oversight Board of the *Statewide Survey of Historical and Archaeological Sites* (Board) seek a qualified consultant to investigate the Archaic Tradition in Central Minnesota. The purpose of the project is to provide a summary of what is known about the Archaic in central Minnesota, to intensively investigate one or more known Archaic sites in order to obtain datable materials associated with diagnostic artifacts, and to produce a descriptive and analytical report summarizing current knowledge about the Archaic in Minnesota, findings of the project, and suggestions for productive directions in future research. The project cost may not exceed $120,000.

The Request for Proposals is available by emailing Mary Green Toussaint, Acting Contracting Officer, at ***mary.green-toussaint@mnhs.org***.

Submission of Proposals

Four (4) hard copies of a proposal must be received by Mary Green Toussaint, Acting Contracting Officer, Minnesota Historical Society, 345 Kellogg Boulevard West, St. Paul, Minnesota 55102-1906, or by a staff member at the first floor reception desk no later than **2:00 Wednesday, July 2, 2014. Late proposals will NOT be considered.**

Minnesota Historical Society (MHS)
and the Oversight Board of the Statewide Survey of Historical and Archaeological Sites
Investigating Poorly Known Regions: The Prehistoric Archaeology of the Minnesota River Trench

Overview

The Minnesota Historical Society (Society) and the Oversight Board of the *Statewide Survey of Historical and Archaeological Sites* (Board) seek a qualified consultant to investigate the prehistoric archaeology of the Minnesota River Trench. The purpose of the project is to help determine where prehistoric sites are located within the Trench, to determine what statewide historic contexts are present, and to suggest productive directions for future archaeological research within the trench. The project cost may not exceed $150,000.

The Request for Proposals is available by emailing Mary Green Toussaint, Acting Contracting Officer, at ***mary.green-toussaint@mnhs.org***.

Submission of Proposals

Four (4) hard copies of a proposal must be received by Mary Green Toussaint, Acting Contracting Officer, Minnesota Historical Society, 345 Kellogg Boulevard West, St. Paul, Minnesota 55102-1906, or by a staff member at the first floor reception desk no later than **2:00 Wednesday, July 2, 2014. Late proposals will NOT be considered.**

Minnesota Department of Transportation (Mn/DOT)
Engineering Services Division
Notice of Potential Availability of Contracting Opportunities for a Variety of Highway Related Technical Activities ("Consultant Pre-Qualification Program")

This document is available in alternative formats for persons with disabilities by calling Kelly Arneson at (651) 366-4774; for persons who are hearing or speech impaired by calling Minnesota Relay Service at (800) 627-3529.

Mn/DOT, worked in conjunction with the Consultant Reform Committee, the American Council of Engineering Companies of Minnesota (ACEC/MN), and the Department of Administration, to develop the Consultant Pre-Qualification Program as a new method of consultant selection. The ultimate goal of the Pre-Qualification Program is to streamline the process of contracting for highway related professional/technical services. Mn/DOT awards most of its consultant contracts for highway-related technical activities using this method, however, Mn/DOT also reserves the right to use Request for Proposal (RFP) or other selection processes for particular projects.

Nothing in this solicitation requires Mn/DOT to use the Consultant Pre-Qualification Program.

Mn/DOT is currently requesting applications from consultants. Refer to Mn/DOT's Consultant Services web site, indicated below, to expenses are incurred in responding to this notice will be borne by the responder. Response to this notice becomes public information under the Minnesota Government Data Practices.

Consultant Pre-Qualification Program information, application requirements and applications forms are available on Mn/DOT's Consultant Services web site at: *http://www.dot.state.mn.us/consult.*

Send completed application material to:

Kelly Arneson
Consultant Services
Office of Technical Support
Minnesota Department of Transportation
395 John Ireland Blvd. - Mail Stop 680
St. Paul, MN 55155

State Contracts

Minnesota Department of Transportation (Mn/DOT)

Engineering Services Division

Notice Concerning Professional/Technical Contract Opportunities and Taxpayers' Transportation Accountability Act Notices

NOTICE TO ALL: The Minnesota Department of Transportation (Mn/DOT) is now placing additional public notices for professional/technical contract opportunities on Mn/DOT's Consultant Services **website** at: *www.dot.state.mn.us/consult*

New Public notices may be added to the website on a daily basis and be available for the time period as indicated within the public notice. Mn/DOT is also posting notices as required by the Taxpayers' Transportation Accountability Act on the above referenced website.

Non-State Public Bids, Contracts & Grants

The *State Register* also serves as a central marketplace for contracts let out on bid by the public sector. The *State Register* meets state and federal guidelines for statewide circulation of public notices. Any tax-supported institution or government jurisdiction may advertise contracts and requests for proposals from the private sector. It is recommended that contracts and RFPs include the following: 1) name of contact person; 2) institution name, address, and telephone number; 3) brief description of commodity, project or tasks; 4) cost estimate; and 5) final submission date of completed contract proposal. Allow at least three weeks from publication date (four weeks from the date article is submitted for publication). Surveys show that subscribers are interested in hearing about contracts for estimates as low as $1,000. Contact editor for futher details.

Besides the following listing, readers are advised to check: *http://www.mmd.admin.state.mn.us/solicitations.htm* as well as the Office of Grants Management (OGM) at: *http://www.grants.state.mn.us/public/*.

Solid Waste Managemenmt Coordinating Board

Notice of Request for Qualifications for Solutions for Increasing Recycling in Multi Family Housing For Solid Waste Management Coordinating Board

NOTICE IS HEREBY GIVEN that the Solid Waste Management Coordinating Board (SWMCB), a six member counties' joint powers board, requests qualifications from any firms interested in assisting the SWMCB and its member counties on increasing recycling in multi-family housing.

The selected firm will identify 3-4 property managers or owners that manage multi family rental properties in more than one SMWCB member county. At least one of the properties should be a CDA or HRA. It is preferred that each SWMCB member county is represented by at least one property manager/owner that manages multi-family housing within its jurisdiction. Once identified, the selected firm will commence testing and documenting strategies for overcoming recycling barriers specific to no less than property configurations and sizes. The selected firm will develop a number of outreach, technical assistance and implementation strategies. In addition to providing SWMCB

with 6 case studies and recycling implementation guidelines or other tools, the selected firm will document increased recycling rates, any savings realized by the property manager/owner from implementing recycling and the ease and likelihood of duplicating the work for other properties managed or owned by the participants. A proposer must respond to the project tasks listed above but SWMCB is also open to a proposer outlining within the contract maximum other approaches that could provide valuable information on the topic.

Work on this project will commence on August 1, 2014 and continue through July 31, 2015.

Anticipated project schedule is:

June 16, 2014	Release RFQ
June 27, 2014	Due date for questions regarding this RFQ
July 9, 2014	RFQ due by 12:00 noon (CST)
July 15 or 16, 2014	Interviews between 8:00 a.m. – 12:00 p.m., if needed
July 23, 2014	Selection of Contractor by Board
August 1, 2014	Contract Term Begins
July 31, 2015	Contract Term Ends

Note: RFQ will be available for downloading at ***www.swmcb.org/rfp***.

Questions regarding this RFP can be submitted by e-mail or written request to:

Trudy Richter
SWMCB
477 Selby Ave
St. Paul, MN 55102
Phone: (651) 222-7227
Fax: (651) 223-5229
E-mail: ***trichter@rranow.com***

If a firm needs an accommodation, such as an interpreter or printed material in an alternate format (i.e. Braille, large print, or audio), contact Trudy Richter, SWMCB, at (651) 222-7227.

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- **On-line orders**: www.minnesotasbookstore.com
- **Minnesota Relay Service**: 8 a.m. - 5 p.m. Monday - Friday, 1.800.627.3529 (nationwide toll-free)
- **Fax** (credit cards): 651.215.5733 (fax line available 24 hours/day)
- **Mail orders**: Orders can be sent to Minnesota's Bookstore, 660 Olive Street, St. Paul, MN 55155

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July 2009

Pollution Control Agency

Proposed Permanent Rules Relating to Human Health Methods for Water Quality

7050.0150 DETERMINATION OF WATER QUALITY, BIOLOGICAL AND PHYSICAL CONDITIONS, AND COMPLIANCE WITH STANDARDS.

[For text of subps 1 to 6, see M.R.]

Subp. 7. **Impairment of waters relating to fish for human consumption.**

A. In evaluating whether the narrative standards in subpart 3, which prevent harmful pesticide or other toxic pollutant residues in aquatic flora or fauna, are being met, the commissioner ~~will~~ must use the methods in:

(1) parts 7050.0218 and 7050.0219 for site-specific fish tissue-based chronic criterion (CC_{ft}); or

(2) parts 7050.0222 and 7052.0100 for fish tissue-based chronic standard (CS_{ft}).

B. If CS_{ft} has not been established for a pollutant with chronic standards (CS) applicable in water (CS_{dfr}, CS_{dev}, or CS_{fr}), the residue levels in fish muscle tissue established by the Minnesota Department of Health must be used to identify surface waters supporting fish for which the Minnesota Department of Health recommends a reduced frequency of fish consumption for the protection of public health. A water body will be considered impaired when the recommended consumption frequency is less than one meal per week, such as one meal per month, for any member of the population. That is, a water body will not be considered impaired if the recommended consumption frequency is one meal per week, or any less restrictive recommendation such as two meals per week, for all members of the population. The impaired condition must be supported with measured data on the contaminant levels in the ~~indigenous~~ resident fish.

C. When making impairment determinations in an individual water body for a pollutant with both a fish tissue-based CC_{ft} or CS_{ft} and a CS applicable in water, comparison of fish tissue data to the CC_{ft} or CS_{ft} must be the basis for the final impairment determination.

[For text of subp 8, see M.R.]

7050.0217 OBJECTIVES FOR PROTECTION OF SURFACE WATERS FROM TOXIC POLLUTANTS.

Subpart 1. **Purpose and applicability.** The purpose of this part ~~and part 7050.0218~~ is to establish ~~methods~~ the objectives for developing numeric water quality standards listed in parts 7050.0220, 7050.0222, 7050.0227, and 7052.0100 and site-specific water quality criteria for toxic pollutants or chemicals developed in the absence of numeric standards ~~listed in parts 7050.0220, 7050.0222, and 7050.0227~~. The listed numeric standards for toxics and site-specific numeric criteria established by ~~these~~ methods in parts 7050.0218 and 7050.0219 protect Class 2 waters for the propagation and maintenance of fish and aquatic life, the consumption of fish and edible aquatic life by humans, the use of surface waters for public and private domestic consumption where applicable, and the consumption of aquatic organisms by wildlife. These criteria also protect the uses assigned to Class 7, limited resource value, waters as described in parts 7050.0140 and 7050.0227.

Subp. 2. **Objectives.**

A. Protection of the aquatic community from the toxic effects of pollutants means the protection of no less than 95 percent of all the species in any aquatic community. Greater protection may be applied to a community if economically, recreationally, or ecologically important species are very sensitive.

B. Protection of human consumers of fish, other edible aquatic organisms, and water for drinking from surface waters means that exposure from noncarcinogenic chemicals ~~shall~~, including nonlinear carcinogens (NLC), singly or in mixtures, must be

below levels expected to produce known adverse effects; the combined risk from mixtures of noncarcinogens and NLC must not exceed the common health risk index endpoints or health endpoints described in part 7050.0222, subpart 7, item D; and the incremental cancer risk from exposure to carcinogenic chemicals, singly or in mixtures, ~~shall~~ must not exceed one in 100,000. The combined risk from mixtures of linear carcinogens (C) will be determined as described in part 7050.0222, subpart 7, item ~~D~~ E.

C. Protection of wildlife that eat aquatic organisms means the protection of the most sensitive wildlife species or populations. Greater protection may be applied if the exposed animals include endangered or threatened wildlife species listed in chapter 6134, or in Code of Federal Regulations, title 50, part 17, under the Endangered Species Act of 1973, United States Code, title 16, sections 1531 to 1543.

7050.0218 FOR TOXIC POLLUTANTS: DEFINITIONS AND METHODS FOR DETERMINATION OF ~~CRITERIA FOR TOXIC POLLUTANTS, FOR WHICH~~ HUMAN HEALTH-BASED NUMERIC STANDARDS ~~NOT PROMULGATED~~ AND SITE-SPECIFIC NUMERIC CRITERIA FOR AQUATIC LIFE, HUMAN HEALTH, AND FISH-EATING WILDLIFE.

Subpart 1. **Purpose.** ~~The Class 2 and Class 7 numeric water quality standards for toxic pollutants in parts 7050.0220, 7050.0222, and 7050.0227 do not address all pollutants which may be discharged to surface waters and cause toxic effects. Therefore, methods are established in this part to address on a site-by-site and case-by-case basis the discharge into surface waters of toxic pollutants not listed in parts 7050.0220, 7050.0222, and 7050.0227.~~ The methods in this part and part 7050.0219 meet the objectives in part 7050.0217 and provide the basis for developing human health-based numeric chronic standards and site-specific numeric criteria for aquatic toxicity, human health, and fish-eating wildlife. The agency may also adopt new standards according to Minnesota Statutes, chapter 14, to replace those listed in parts 7050.0220 to 7050.0227 and 7052.0100 that are more stringent or less stringent if new scientific evidence shows that a change in the standard is justified.

Subp. 2. **Site-specific criteria.** The Class 2 and Class 7 numeric water quality standards for toxic pollutants in parts 7050.0220, 7050.0222, 7050.0227, and 7052.0100 do not address all pollutants that may be discharged to surface waters and cause toxic effects. Therefore, methods are established in this part and part 7050.0219 to address on a site-specific basis the discharge into surface waters of toxic pollutants not listed in parts 7050.0220, 7050.0222, 7050.0227, 7052.0100. Class 2 and Class 7 site-specific numeric criteria for toxic pollutants shall be derived by the commissioner using the procedures in this part.

[For text of items A and B, see M.R.]

Subp. 3. **Definitions.** For the purposes of parts 7050.0217 to 7050.0227, the following terms have the meanings given them.

[For text of items A and B, see M.R.]

C. "Adjustment factor, lifetime" or "$AF_{lifetime}$" means the numeric multiplier used to modify the adult-based cancer slope factor for lifetime (70 years standard in risk characterization) exposure based on chemical-specific data.

D. "Adverse effect" means a biochemical change, functional impairment, or pathologic lesion that affects the performance of the whole organism or reduces an organism's ability to respond to an additional environmental challenge.

E. "Age-dependent adjustment factor" or "ADAF" means the default numeric modifiers to the cancer slope factor that account for the increased susceptibility to cancer from early-life exposures to linear carcinogens in the absence of chemical-specific data. For default use, there are three ADAF:

(1) $ADAF_{0<2} = 10$, for birth up to two years of age;

(2) $ADAF_{2 \text{ to } <16} = 3$, for two up to 16 years of age; and

(3) $ADAF_{16+} = 1$, for 16 years of age and older.

~~C.~~ F. "Available and reliable scientific data" means information derived from scientific literature including: published literature in peer reviewed scientific journals, USEPA ambient water quality criteria documents, and other reports or documents published by the USEPA or other governmental agencies.

~~D.~~ G. "Bioaccumulation factor" or "BAF" means the concentration of a pollutant in one or more tissues of an aquatic organism, exposed from any source of the pollutant but primarily from the water column, diet, and bottom sediments, divided by the average concentration in the solution in which the organism had been living, under steady state conditions.

H. "Bioaccumulative chemical of concern" or "BCC" has the meaning given in part 7052.0010, subpart 4.

~~E.~~ I. "Bioconcentration factor" or "BCF" means the concentration of a pollutant in one or more tissues of an aquatic organism, exposed only to the water as the source of the pollutant, divided by the average concentration in the solution in which the organism had been living, under steady state conditions.

J. "Biomagnification" means the increase in tissue concentration of a pollutant in aquatic organisms at successive trophic levels through a series of predator-prey associations, primarily occurring through dietary accumulation. The expression used to quantify this increase is the biomagnification factor or "BMF." For a given water body, the BMF is calculated as:

(1) the ratio of the tissue concentration of a pollutant in a predator at a particular trophic level to the tissue concentration in its prey at the next lower trophic level; or

(2) the ratio estimated from a comparable laboratory model.

K. "Biota-sediment accumulation factor" or "BSAF" means the ratio (in kilogram of organic carbon/kilogram of lipid) of a pollutant's lipid-normalized concentration in tissue of an aquatic organism to its organic carbon-normalized concentration in surface sediment, where:

(1) the ratio does not change substantially over time;

(2) both the organism and its food are exposed; and

(3) the surface sediment is representative of average surface sediment in the vicinity of the organism.

~~F.~~ L. "Cancer potency slope factor" or ~~"ql*"~~ "CSF" means a factor indicative of a chemical's human cancer causing potential~~. The ql* is the upper 95 percent confidence limit (one-sided) of the slope from a linear nonthreshold dose-response model used by the USEPA to provide an upper bound estimate of incremental cancer risk. The ql* assumes a lifetime exposure and is expressed in days times kilogram body weight per milligram toxicant (d x kg/mg).~~ and an upper-bound estimate of cancer risk per increment of dose that can be used to estimate cancer risk probabilities for different exposure levels. CSF is expressed in units of cancer incidence per milligram of pollutant per kilogram of body weight-day $(mg/kg\text{-}day)^{-1}$.

M. "Cancer risk level" or "CR" means the probability that daily exposure to a carcinogen over a lifetime may induce cancer. CR refers to an incremental or additional excess cancer risk equal to 1×10^{-5} (1 in 100,000) and is applied with the cancer potency slope factor for single chemicals and for mixtures.

N. "Carcinogen, linear" or "C" means a chemical agent for which, either by a known mode of action or a conservative assumption, the associated cancer risk varies in direct proportion to the extent of exposure and for which there is no risk-free level of exposure. The toxicological value for a C is the cancer potency slope factor. Seventy years

is the standard lifetime duration used by United States Environmental Protection Agency in the characterization of lifetime cancer risk.

O. "Carcinogen, nonlinear" or "NLC" means a chemical agent for which, particularly at low doses, the associated cancer risk does not rise in direct proportion to the extent of exposure and for which a threshold level of exposure exists below which there is no cancer risk. For NLC, the reference dose is the toxicological value used as the threshold for cancer risk.

~~G.~~ P. "Chronic toxicity" means a stimulus that lingers or continues for a long period of time, often one-tenth the life span or more. A chronic effect can be mortality, reduced growth, reproduction impairment, harmful changes in behavior, and other nonlethal effects.

~~H.~~ Q. "Chronic criterion" or "CC" ~~means~~ and "chronic standard" or "CS" mean the highest water concentration or fish tissue concentration of a toxicant or effluent to which ~~organisms, including~~ aquatic life, humans ~~or~~, wildlife, or other organisms can be exposed indefinitely without causing chronic toxicity. CC represents a site-specific chronic criterion developed under this part and part 7050.0219 or part 7052.0110. CS represents a chronic standard listed in parts 7050.0220 and 7050.0222 or in part 7052.0100. CC and CS are further distinguished by the organisms they are developed to protect and medium in which they apply:

~~"CC_{df}" means a chronic criterion~~

(1) CC_{tox} or CS_{tox} represent values applied in surface water developed to protect aquatic life from chronic toxicity;

(2) CC_{dfr} or CS_{dfr} represent values applied in surface water based on protecting humans from exposure to the pollutant from ~~both~~ drinking water ~~and~~, eating ~~sport-caught~~ fish. ~~"CC_f" means a chronic criterion~~, and aquatic recreation;

(3) CC_{fr} or CS_{fr} represent values applied in surface water based on protecting humans from exposure to the pollutant from eating ~~sport-caught~~ fish ~~only.~~ and aquatic recreation;

(4) CC_{ft} or CS_{ft} represent values applied in fish tissue based on protecting humans from exposure to the pollutant from eating fish; and

(5) ~~"~~CC_w~~" means a chronic criterion~~ represents values applied in surface water based on protecting wildlife from exposure to the pollutant from eating aquatic organisms.

~~I. "Chronic standard" or "CS" means the highest water concentration of a toxicant to which organisms can be exposed indefinitely without causing chronic toxicity. Chronic standards are listed in parts 7050.0220 and 7050.0222.~~

~~J.~~ R. "Chronic value" means the geometric mean of the highest tested concentration that did not cause an unacceptable adverse effect and the lowest tested concentration that did cause an unacceptable adverse effect, and in which all higher test values cause an effect, in an approved chronic test.

~~K.~~ S. "Cold water fisheries" means a community of fish including species of trout and salmon from the Salmonidae family that inhabit trout waters as defined in part 7050.0420.

~~L.~~ T. "Criterion" means a number or numbers established for a pollutant derived under this part or part 7050.0219 or 7052.0110, or issued by the USEPA, to protect aquatic life, humans, or wildlife.

U. "Developmental health endpoint" or "developmental toxicity" means an adverse effect on the developing organism that may result from parental exposure prior to conception, maternal exposure during prenatal development, or direct exposure postnatally

until the time of sexual maturation. Developmental toxicity may be detected at any point in the lifespan of the organism. The major manifestations of developmental toxicity include:

(1) death of the developing organism;

(2) structural abnormality;

(3) altered growth; or

(4) functional deficiency.

~~M.~~ V. "Duration" means the time over which the instream concentration of a pollutant is averaged for comparison with the standard or criterion.

W. "Durations for human health-based algorithms" or "D" means the length of the exposure period under consideration for noncancer and linear cancer algorithms.

(1) The four default D used in developing reference doses and corresponding intake rates are:

(a) acute: a period of 24 hours or less;

(b) short-term: a period of more than 24 hours, up to 30 days;

(c) subchronic: a period of more than 30 days, up to eight years based on application of the less than ten percent standard life expectancy of 70 years for humans; or

(d) chronic: a period of more than eight years.

(2) The default durations for use in the linear cancer algorithms with age dependent adjustment factors are:

(a) two years for the birth up to two-year age group;

(b) 14 years for the two- up to 16-year age group; and

(c) 54 years for the 16- up to 70-year age group.

For any algorithm, use of chemical-specific data to define durations for noncancer or linear cancer algorithms are preferred when acceptable data are available.

~~N.~~ X. "Effect concentration" or "EC50" means the toxicant concentration that causes equilibrium loss, immobilization, mortality, or other debilitating effects in 50 percent of the exposed organisms during a specific time of observation.

Y. "Endocrine" or "E" means a change in circulating hormone levels or interactions with hormone receptors, regardless of the organ or organ system affected. Health endpoints with or without the E designation are deemed equivalent, for example, thyroid (E) = thyroid, and must be included in the same health risk index equation.

~~O.~~ Z. "Final acute value" or "FAV" means an estimate of the concentration of a pollutant corresponding to the cumulative probability of 0.05 in the distribution of all the acute toxicity values for the genera or species from the acceptable acute toxicity tests conducted on a pollutant. The FAV is the acute toxicity limitation applied to mixing zones in part 7050.0210, subpart 5; and to dischargers in parts 7053.0215, subpart 1; 7053.0225, subpart 6; and 7053.0245, subpart 1.

AA. "Food chain multiplier" or "FCM" means the ratio of a bioaccumulation factor by trophic level to an appropriate bioconcentration factor. FCM refers to values developed using USEPA models or from available and reliable field studies.

BB. "Frequency" means the number of times a standard can be exceeded in a specified period of time without causing acute or chronic toxic effects on the aquatic community, human health, or fish-eating wildlife.

~~P.~~ CC. "Genus mean acute value" or "GMAV" means the geometric mean of the SMAVs available for the genus.

DD. "Health risk index" means the sum of the quotients calculated by identifying all chemicals that share a common health endpoint or are based on linear carcinogenicity

and dividing the water or fish tissue concentration for each chemical (measured or statistically derived) by its applicable chronic standard or chronic criterion. To meet the objectives in part 7050.0217, the health risk index must not exceed a value of one. The equations for the risk indices are found in part 7050.0222, subpart 7, items D and E.

EE. "Health risk index endpoint" or "health endpoint" means the general description of toxic effects used to group chemicals for the purpose of calculating a health risk index.

FF. "Intake rate" or "IR" means rate of ingestion, inhalation, or dermal contact, depending on the route of exposure, expressed as the amount of a media taken in, on a per body weight and daily basis, for a specified duration.

~~Q.~~ GG. "Lethal concentration" or "LC50" means the toxicant concentration killing 50 percent of the exposed organisms in a specific time of observation.

~~R.~~ HH. "Lowest observable adverse effect level" or "LOAEL" means the lowest ~~tested concentration~~ exposure level that caused a statistically or biologically significant ~~occurrence of an adverse effect in comparison with a control when all higher test concentrations caused adverse effects~~ increase in the frequency or severity of adverse effects observed between the exposed population and its appropriate control group.

II. "Magnitude" means the acceptable amount of a toxic pollutant in water or fish tissue expressed as a concentration.

~~S.~~ JJ. "Maximum criterion" or "MC" means the highest concentration of a toxicant in water to which aquatic organisms can be exposed for a brief time with zero to slight mortality. The MC equals the FAV divided by two.

~~T.~~ KK. "Maximum standard" or "MS" means the highest concentration of a toxicant in water to which aquatic organisms can be exposed for a brief time with zero

to slight mortality. The MS equals the FAV divided by two. Maximum standards are listed in part 7050.0222.

LL. "MDH" means the Minnesota Department of Health.

MM. "Mode of action" or "MOA" means the sequence of key events following pollutant or chemical exposure upon which the toxic outcome depends.

~~U.~~ NN. "National methods" means the methods the USEPA uses to develop aquatic life criteria as described in Stephan, C.E., D.J. Mount, D.J. Hansen, J.H. Gentile, G.A. Chapman, and W.A. Brungs, 1985, "Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses," USEPA, Office of Research and Development, Environmental Research Laboratories, Duluth MN; Narragansett, RI, Corvallis, OR. 98 p; available through the National Technical Information Service, Springfield, VA. (Publication PB85-227049)

~~V.~~ OO. "No observable adverse effect level" or "NOAEL" means ~~the highest tested concentration that did not cause a statistically significant occurrence of an adverse effect in comparison with a control when no lower test concentration caused an injurious or adverse effect~~ an exposure level at which there is no statistically or biologically significant increase in the frequency or severity of adverse effects between the exposed population and its appropriate control group.

~~W.~~ PP. "Octanol to water partition coefficient" or "K_{ow}" means the ratio of the concentration of a ~~substance~~ chemical in the octanol phase to its concentration in the aqueous phase of a two-phase octanol to water system after equilibrium of the ~~substance~~ chemical between the two phases has been achieved. The base 10 logarithm of the K_{ow} or log K_{ow} is used in the calculation of bioaccumulation factors. The $\log_{~~10~~} K_{ow}$ has been shown to be proportional to the bioconcentration potential of lipophilic organic chemicals.

~~X. "Parachor" means the surface tension adjusted molar volume, and specifically is the molecular weight of a liquid times the fourth root of its surface tension, divided by the~~

~~difference between the density of the liquid and the density of the vapor in equilibrium with it; essentially constant over wide ranges of temperature. Parachor relates to the physical properties of a molecule that affect its potential to bioaccumulate in aquatic organisms.~~

~~Y.~~ QQ. "Percent effluent" means the representation of acute or chronic toxicity of an effluent as a percent of whole effluent mixed in dilution water, where acute toxicity is expressed by LC50s or EC50s and chronic toxicity is expressed by ~~NOAELs~~ NOAEL.

~~Z.~~ RR. "Reference dose" or "RfD" means an estimate of a ~~daily exposure to the human population, including sensitive subpopulations, that is likely to be without appreciable risk or deleterious effects over a lifetime. The RfD is expressed in units of daily dose, mg/kg/day.~~ dose for a given duration to the human population, including susceptible subgroups such as infants, that is likely to be without an appreciable risk of adverse effects during a lifetime. It is derived from a suitable dose level at which there are few or no statistically or biologically significant increases in the frequency or severity of an adverse effect between the dosed population and its associated control group. The RfD includes one or more divisors, applied to the suitable dose level, accounting for:

(1) uncertainty in extrapolating from mammalian laboratory animal data to humans;

(2) variation in toxicological sensitivity among individuals in the human population;

(3) uncertainty in extrapolating from effects observed in a short-term study to effects of long-term exposure;

(4) uncertainty in using a study in which health effects were found at all doses tested; and

(5) uncertainty associated with deficiencies in the available data.

The RfD is expressed in units of daily dose as milligrams of chemical per kilogram of body weight-day or mg/kg-day.

~~AA.~~ SS. "Relative source contribution factor" or "RSC" means the ~~fraction of the total allowable daily dose of a toxic pollutant that is attributed to drinking water and fish consumption relative to other sources of the pollutant to humans, such as air or food, in the calculation of criteria.~~ percentage or apportioned amount (subtraction method) of the reference dose for a pollutant allocated to surface water exposures from drinking or incidental water ingestion and fish consumption. In the absence of sufficient data to establish a pollutant- or chemical-specific RSC value, the default RSC is 0.2 or 0.5 as described in part 7050.0219, subpart 5.

~~BB.~~ TT. "Species mean acute value" or "SMAV" means the geometric mean of all the available and acceptable acute values for a species.

~~CC.~~ UU. "Standard" means a number or numbers established for a pollutant or water quality characteristic to protect a specified beneficial use as listed in parts 7050.0221to 7050.0227. The standard for a toxic pollutant includes the CS, MS, and FAV. Some pollutants do not have an MS or an FAV due to insufficient data. For these pollutants, the CS alone is the standard.

VV. "Toxic effect" means an observable or measurable adverse biological event in an organ, tissue, or system. The designation of health endpoints does not exclude other possible observable or measurable biological events. For the purpose of grouping chemicals and creating a health risk index when multiple chemicals are present, toxic effects may be ascribed to more general health risk index endpoints or health endpoints.

~~DD.~~ WW. "Toxic pollutant" has the meaning given it in part 7050.0185, subpart 2, item F. Toxic pollutant is used interchangeably in this part and parts 7050.0217, 7050.0219, and 7050.0222, subpart 7, items B to G, with the terms "pollutant" and "chemical."

~~EE.~~ XX. "Toxic unit" means a measure of acute or chronic toxicity in an effluent. One acute toxic unit (TUa) is the reciprocal of the effluent concentration that causes 50 percent effect or mortality to organisms for acute exposures (100/LC50); one chronic toxic unit (TUc) is the reciprocal of the effluent concentration that causes no observable adverse effect level on test organisms for chronic exposures (100/NOAEL).

YY. "Trophic level" or "TL" means the food web level in an ecosystem that is occupied by an organism or group of organisms because of what they eat and how they are related to the rest of the food web. For example, trophic level 3 in an aquatic ecosystem consists of small fish such as bluegills, crappies, and smelt and trophic level 4 consists of larger carnivorous fish such as walleye, northern pike, and most trout species.

~~FF.~~ ZZ. "USEPA" means the United States Environmental Protection Agency.

~~GG.~~ AAA. "Water quality characteristic" means a characteristic of natural waters, such as total hardness or pH. Some water quality characteristics can affect the toxicity of pollutants to aquatic organisms.

~~HH.~~ BBB. "Whole effluent toxicity test" means the aggregate toxic effect of an effluent measured directly by a toxicity test. Effects on tested organisms are measured and expressed as toxic units or percent effluent for both acute and chronic whole effluent toxicity tests.

Subp. 4. **Adoption of USEPA national criteria.** The USEPA establishes aquatic life and human health-based criteria under section 304(a)(1) of the Clean Water Act, United States Code, title 33, section 1314. The USEPA criteria, subject to modification as described in this subpart, are applicable to Class 2 waters of the state. The USEPA has described the national methods for developing aquatic life criteria in "Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses."

USEPA criteria that vary with an ambient water quality characteristic such as total hardness or pH will be established for specific waters or reaches using data available to the commissioner. Central values such as the means or medians for the characteristic will be used unless there is evidence to support using different values. Values for water quality characteristics can be estimated for specific waters or reaches that have no data by using data from a nearby watershed with similar chemical properties.

A. The USEPA aquatic life criteria are adopted unchanged by the agency, unless modified under item C, as the criteria applicable to designated ~~trout waters. Trout (Class 2A)~~ Class 2A waters ~~are listed~~ in parts 7050.0420 and 7050.0470.

[For text of item B, see M.R.]

C. If the commissioner finds that the information that supports a USEPA criterion is no longer current or complete for reasons including, but not limited to, changes to the relationship between a water quality characteristic and toxicity; the ACR; the weight given to toxicity data for a commercially or recreationally important species; ~~the RfD; the ql*; or the BAF~~ or the human health-based methods; then the commissioner shall evaluate all available information and modify the criterion according to the information and with the objectives in part 7050.0217 and the methods in this part and part 7050.0219. Any effluent limitation determined to be necessary based on site-specific criteria derived under this item shall only be required after the discharger has been given notice to the specific proposed effluent limitations and an opportunity to request a hearing as provided in part 7000.1800.

Subp. 5. **Toxicity-based criteria.** Toxicity-based aquatic life criteria shall be determined using the methods in this subpart when no USEPA criterion is available.

[For text of items A to D, see M.R.]

E. The CC_{tox} is the FAV divided by an ACR. Available chronic data are used to determine ACRs as described in item F and measured chronic values are compared to the CC_{tox}. If an approved chronic value for a commercially, recreationally, or ecologically

important freshwater species is lower than the CC_{tox}, the CC_{tox} will be set to equal that chronic value.

[For text of item F, see M.R.]

G. If the acute data available do not meet the requirements in items A and B, toxicity-based criteria can be determined by the method in this item. This method is not applicable to ionizable organic chemicals, or to bioaccumulative organic chemicals and pesticides with ~~BCFs~~ BCF greater than 5,000 or log K_{ow} values greater than 5.19.

[For text of subitems (1) to (10), see M.R.]

(11) The CC_{tox} is calculated by dividing the FAV by the appropriate ACR.

(12) If chronic data are available, they are used to determine measured ~~ACRs~~ ACR as described in item F, and chronic data are compared to the CC_{tox}.

Subp. 6. [See repealer.]

Subp. 7. [See repealer.]

[For text of subp 8, see M.R.]

Subp. 9. **Wildlife-based criteria.** The agency shall use the procedures in this subpart to establish wildlife-based criteria. Wildlife criteria shall protect wildlife consumers of freshwater aquatic organisms from adverse effects of toxic pollutants. Wildlife criteria are applicable to all surface waters, subject to the exceptions in subpart 10, item B, subitem (1).

[For text of item A, see M.R.]

B. Wildlife-based criteria are calculated using the following formula:

$$CC_w \text{ mg/L} = \frac{NOAEL \times BWt \times SSF}{DW + (F \times BAF)}$$

where: CC_w = wildlife chronic criterion in mg/L

NOAEL = no observable adverse effect level in mg of substance per kg of body weight per day (mg/kg BWt/day) as derived from mammalian or avian toxicity studies. If the NOAEL is in mg/L, the NOAEL will be multiplied by the average daily volume of water consumed by the test animals in liters per day and divided by the average weight of the test animals in kg. If the NOAEL is in mg/kg of food consumed, the NOAEL will be multiplied by the average amount of food consumed daily by the test animals and divided by the average weight of the test animals in kg

BWt = average body weight of test organisms in kg

SSF = species sensitivity factor to account for difference in the sensitivity in test species. This factor will vary between 1 and 0.1. The appropriate factor will be determined by the commissioner based on available and reliable scientific data on the relative sensitivity of the test organism compared to other wildlife species

DW = average volume of water consumed per day by the test animals in liters

F = average amount of food consumed per day by test animals in kg

BAF = BAF in liters per kg

[For text of items C and D, see M.R.]

Subp. 10. **Applicable criteria or human health-based standard.** ~~The criterion for a pollutant includes: the CC, the MC, and the FAV.~~ The final criteria or chronic standard for human health for toxic pollutants for surface waters are must be the lowest of the applicable criteria or standards for human health derived under this part and part 7050.0219.

A. Applicable criteria or standards for human health by use for Class 2A, 2Bd, 2B, 2C, and 2D surface waters are listed for each applicable population protected (aquatic life, humans, and fish-eating wildlife). The applicable criteria or standards for human health must be the lowest of the ~~following~~ CC or CS as described in subitems (1) to (3):

(1) for aquatic life toxicity: a CC_{tox} and MC based on toxicity to aquatic organisms from subpart 4 or 5 or a CC_{tox} based on plant toxicity from subpart 4 or 5;

~~(2) a CC based on plant toxicity from subpart 4 or 5;~~

~~(3)~~ (2) for human health: a ~~CC_{df} or CC_f from subparts 6 and 7~~ CC or CS by medium (water or fish) as described in part 7050.0219, subpart 2, or a concentration that will prevent unacceptable taste or odor in water, fish, or other edible aquatic organisms from subpart 8; or

~~(4) a concentration that will prevent unacceptable taste or odor in water, fish, or other edible aquatic organisms from subpart 8; or~~

~~(5)~~ (3) when available, for fish-eating wildlife: a CC_w from subpart 9.

B. Applicable criteria for Class 7 waters ~~are~~ must be the lowest of the following:

[For text of subitems (1) and (2), see M.R.]

C. If the site-specific application of criteria developed in this subpart is used to establish an effluent limitation for national pollutant discharge elimination system and state disposal system permits or to establish the degree of remedial action cleanup activities, the provisions of part 7050.0222, subpart 7, items B to ~~E~~ G, apply.

D. The CS or CC and MS or MC must be averaged over the durations described in part 7050.0222, subpart 7, item C.

7050.0219 HUMAN HEALTH-BASED CRITERIA AND STANDARDS.

Subpart 1. **Objective.** Human health-based criteria and standards protect humans from potential adverse effects of eating fish and edible aquatic organisms and incidental ingestion of water while recreating in Class 2 waters and from the consumption of drinking water from Class 1 surface waters (includes Class 2A and 2Bd waters). Human health-based criteria and standards must be determined using the methods in this part.

Subp. 2. **Applicability of methods.** Human health-based chronic criteria (CC) or chronic standards (CS) must be evaluated based on the pollutant's toxicological profile: noncarcinogen or nonlinear carcinogen (NLC), developmental susceptibility, and linear carcinogen (C).

A. Algorithms for these toxicological profiles by Class 2 subclasses are described in subparts 13 to 15. Other scientifically defensible algorithms may be applied by the commissioner on a chemical-specific basis for evaluating developmental susceptibility to toxic pollutants in fish tissue based on the consideration listed in subparts 3 to 5.

B. The most stringent CC or CS by medium (water or fish tissue), Class 2 subclass, and toxicological profile, or taste and odor criteria as described in part 7050.0218, subpart 8, are the final applicable human health-based CC or CS.

Subp. 3. **Available and reliable scientific data.** The data and information used to develop a site-specific CC or CS must be approved by the commissioner. The commissioner must consider measures of availability and reliability of the data and information.

Subp. 4. **Toxicological values.** The RfD used to calculate criteria for noncarcinogenic and nonlinear carcinogenic chemicals (NLC) and the CSF and $AF_{lifetime}$ or CSF and ADAF used to calculate CC or CS for linear carcinogenic (C) chemicals are obtained from the MDH or developed according to parts 4717.7820, subparts 5 and 21, and 7050.0218, subpart 3.

Subp. 5. **Exposure values.** Drinking water intake rates are obtained from the MDH. RSC uses a default value of 0.2 for most pollutants, unless:

A. there are no significant known or potential sources other than those addressed for the designated use, then 0.5 must be used; or

B. sufficient exposure data are available to support an alternative pollutant-specific value between 0.2 and 0.8.

Subp. 6. **Bioaccumulation factors.** This subpart describes the process and data for deriving bioaccumulation factors (BAF) used in the calculation of the human health-based chronic criteria (CC) or chronic standards (CS).

A. Information used for defining BAF must be consistent with the pollutant form used to derive the RfD or CSF. BAF development must also consider other forms that bioaccumulate in fish tissue. The preferred bioaccumulation data are available and reliable field and laboratory studies.

B. A general description of the steps and data used to determine final state or site BAF are listed in subitems (1) to (6) and described in detail in subparts 7 to 12.

(1) Categorize the pollutant based on certain properties into one of three broadly defined chemical categories: nonionic organic, ionic organic, or inorganic and organometallic chemicals as described in subpart 7.

(2) Define the methods for developing baseline BAF as described in subpart 8. A baseline BAF is the expression of the BAF based on the bioavailable or freely dissolved fraction of a pollutant in the ambient water and normalized concentration of the pollutant within the organism.

(3) Determine the relevant procedure (1 to 6) for identifying the acceptable baseline BAF methods (maximum of four) and their hierarchy for developing individual or aquatic species-specific baseline BAF as described in subpart 9.

(4) Calculate species mean baseline BAF from acceptable individual baseline BAF as described in subpart 10.

(5) Determine final baseline BAF for TL_3 and TL_4 as described in subpart 11.

(6) Develop final state or site BAF for TL_3 and TL_4 based on default parameters by Class 2 subclass or site-specific data as described in subpart 12.

Subp. 7. **Chemical categorization.** For BAF purposes, organic chemicals that have no or negligible ionization at the pH range of ambient surface waters are categorized as nonionic organic chemicals; organic chemicals that undergo ionization at the pH range of ambient surface waters are categorized as ionic organic chemicals and further delineated

for BAF development based on subpart 9, item C; organometallic chemicals and other chemicals or elements are categorized as organometallic and inorganic chemicals.

Subp. 8. **Methods for baseline BAF.** The four methods for developing baseline BAF in items A to D are listed in a hierarchy from most preferred to least preferred, except as noted in subpart 9: use of field-measured BAF studies (field BAF); use of field-measured BSAF studies (field BSAF); use of laboratory-measured BCF studies with food chain multipliers (lab BCF*FCM); and use of octanol-water partition coefficients with food chain multipliers (K_{ow}*FCM). Where relevant, differences in the baseline BAF methods are described by chemical categorization.

A. Method 1: Field BAF. The field-measured BAF for a nonionic organic chemical is calculated based on the total concentration of the chemical in the appropriate tissue of the aquatic organism (on a wet tissue basis) and the total concentration of chemical in ambient surface water at the site of sampling (BAF^{t}_{T}).

measured $BAF^{t}_{T} = C_t/C_w$

where: BAF^{t}_{T} = field-measured BAF based on total concentration in tissue and water (L/kg)

C_t = total concentration of the chemical in the specified wet tissue (µg/kg)

C_w = total concentration of the chemical in water (µg/L)

The measured BAF^{t}_{T} is converted to a baseline BAF or BAF_{l}^{fd} by the following equation:

$$\text{baseline } BAF_l^{fd} = \left[\frac{\text{measured } BAF_T^t}{f_{fd}}\right]\left(\frac{1}{f_l}\right)$$

where: baseline BAF_{l}^{fd} = BAF expressed on a freely dissolved and lipid-normalized basis (L/kg)

f_l = fraction of the tissue that is lipid

f_{fd} = fraction of the total chemical that is freely dissolved in ambient surface water

The freely dissolved fraction or f_{fd} is the portion of the nonionic organic chemical that is not bound to particulate organic carbon or dissolved organic carbon and is calculated:

$$f_{fd} = \frac{1}{[1 + (POC \times K_{OW}) + (DOC \times 0.08 \times K_{OW})]}$$

where: POC = concentration of particulate organic carbon (kg/L)

DOC = concentration of dissolved organic carbon (kg/L)

K_{OW} = n-octanol water partition coefficient for the chemical

POC and DOC concentrations are obtained from the original study from which the field-measured BAF is determined. If POC and DOC concentrations are not reported in the BAF study, reliable estimates of POC and DOC are obtained from other studies at closely related sites within the same water body. If no study data are available, the USEPA national default DOC and POC values are used, as they are representative of average ambient surface water conditions. The USEPA national default values are DOC of 2.9 mg/L and POC of 0.5 mg/L, converted to kg/L by dividing by 1,000,000.

For the field-measured BAF for a chemical classified as inorganic and organometallic, the field BAF is equal to the baseline BAF and is not expressed on a lipid or freely dissolved fraction basis. Normalization on other characteristics must be supported by chemical-specific data.

B. Method 2: Field BSAF. For nonionic organic chemicals, the field-measured BSAF is determined by relating lipid-normalized concentration of the chemical in the appropriate tissue of the aquatic organism to organic carbon-normalized concentrations of the chemical in the surface sediment.

$$BSAF = \frac{C_l}{C_{soc}}$$

where: BSAF = biota-sediment accumulation factor for the chemical (kg of sediment organic carbon/kg of lipid)

C_l = lipid-normalized concentration of the chemical in the specified wet tissue (µg/g lipid), calculated as:

$$C_l = \frac{C_t}{f_l}$$

where: f_l = fraction lipid content in the tissue

Other variables as defined under item A

C_{soc} = organic-carbon normalized concentration of a chemical in surface sediment samples (µg/g sediment organic carbon), calculated as:

$$C_{soc} = \frac{C_s}{f_{oc}}$$

where: C_s = concentration of chemical in dry sediment (µg/g sediment)

f_{oc} = fraction organic carbon in dry sediment

The measured BSAF is converted to a baseline BAF or BAF_l^{fd} by the following equation:

$$(\text{baseline } BAF_l^{fd})_i = (BSAF)_i \frac{(\Pi_{socw})_r (D_{i/r}) (K_{OW})_i}{(K_{ow})_r}$$

where: $(\text{baseline } BAF_l^{fd})_i$ = BAF expressed on a freely dissolved and lipid-normalized basis for chemical of interest "i" or the chemical that is the basis of the criteria (L/kg)

$BSAF_i$ = measured BSAF for the chemical "i" (kg organic carbon/kg of lipid)

$(\Pi_{socw})_r$ = sediment to water partition coefficient or sediment organic carbon to freely dissolved concentration ratio of the reference chemical "r." Reference chemicals with $(\Pi_{socw})_r/(K_{ow})$ similar to that of the chemical of interest are preferred for this method (L/kg sediment organic carbon)

$$\left(\prod_{socw}\right)_r = \frac{\left(C_{soc}\right)_r}{\left(C_w^{fd}\right)_r}$$

where: $(C_{soc})_r$ = concentration of the reference chemical "r" in dry sediment normalized to sediment organic carbon (µg/kg sediment organic carbon)

$(C_w^{fd})_r$ = concentration of the reference chemical "r" freely dissolved in water (µg/L)

$(D_{i/r})$ = ratio between Π_{socw}/K_{ow} for chemicals "i" and reference chemical "r"; a ratio equal to or close to one is preferred

$(K_{ow})_i$ = octanol-water partition coefficient for the chemical "i"

$(K_{ow})_r$ = octanol-water partition coefficient for the reference chemical "r"

Other variables as defined under item A

C. Method 3: Lab BCF*FCM. The laboratory-measured BCF for nonionic organic chemicals is calculated based on the total concentration of the chemical in the appropriate tissue of the aquatic organism (on a wet tissue basis) and the total concentration of chemical in the study water (BCF_T^t).

$$\text{measured } BCF_T^t = \frac{C_t}{C_w}$$

where: C_w = total concentration of chemical in the laboratory test water (µg/L)

Other variables as defined under item A

Baseline BAF_l^{fd} equation:

$$\text{baseline } BAF_l^{fd} = (FCM)\left[\frac{\text{measured } BCF_T^t}{f_{fd}} - 1\right] x \left(\frac{1}{f_l}\right)$$

where: f_{fd} = fraction of the total chemical in the test water that is freely dissolved, where POC and DOC or reasonable estimates based on total organic carbon (TOC) values measured in the test water are used, unless not available, then the following defaults are used based on typical lab water characteristics: DOC of 2.5 mg/L and POC at 0 mg/L, converted to kg/L by dividing by 1,000,000

FCM = food chain multiplier

Other variables as defined under item A

For ionic organic, inorganic, and organometallic chemicals, based on available data, the laboratory BCF is equal to the baseline BAF and is not expressed on a lipid or freely dissolved fraction basis. Normalization on other characteristics must be supported by chemical-specific data. FCM must come from field BAF studies.

D. Method 4: K_{ow}*FCM. In this method, K_{ow} is assumed to be equal to the baseline BAF_1^{fd} for certain nonionic organic chemicals described in the procedures.

$$\text{baseline } BAF_1^{fd} = (FCM) \times (K_{ow})$$

where: Variables as defined under items A and C

Subp. 9. **Hierarchy of acceptable baseline BAF methods.** Determine the hierarchy of acceptable baseline BAF methods available under subpart 8 for appropriate use based on the chemical categorization of the pollutant and other relevant properties as described under Procedures 1 to 6.

A. Procedures 1 to 6 are used for defining the hierarchy and use of the four baseline BAF methods based on chemical categorization and a chemical's ionization state in ambient surface waters, hydrophobicity, biomagnification, and metabolism in aquatic organisms, primarily freshwater fish species. Table 1 provides the basic information for identifying the acceptable procedures and hierarchy for baseline BAF methods as described under items B to D:

Table 1.
Chemical Categorization

Nonionic Organic and Ionic (negligible ionization) Organic Chemicals				Inorganic, Organometallic, and Ionic Chemicals	
Hydrophobicity				Biomagnification Factor (BMF)	
$\log K_{ow} \geq 4$		$\log K_{ow} < 4$		BMF ≤ 1,000	BMF > 1,000
Metabolism in Aquatic Organisms (Fish)					
Low or Unknown	High	Low or Unknown	High		
Procedures:					
Procedure 1	Procedure 2	Procedure 3	Procedure 4	Procedure 5	Procedure 6
1) Field BAF 2) Field BSAF 3) Lab BCF*FCM 4) K_{ow}*FCM	1) Field BAF 2) Field BSAF 3) Lab BCF	1) Field BAF or Lab BCF 2) K_{ow}	Field BAF or Lab BCF	Field BAF or Lab BCF	1) Field BAF 2) Lab BCF*FCM

B. For nonionic (neutral) organic chemicals, defined as chemicals that have no or negligible ionization in ambient surface water, Procedures 1 to 4 describe the hierarchy of acceptable baseline BAF methods to use.

(1) Procedure 1 applies to nonionic organic chemicals with moderate to high hydrophobicity defined as log K_{ow} greater than or equal to (≥) 4 and either a low level of documented metabolism in aquatic organisms or lack of sufficient data to characterize metabolism. All four baseline BAF methods are available for use based on the stated hierarchy in Table 1 and availability of acceptable data.

(2) Procedure 2 applies to nonionic organic chemicals with moderate to high hydrophobicity defined as log $K_{ow} \geq 4$ and a high level of documented metabolism in aquatic organisms. The acceptable methods are field BAF, BSAF, and lab BCF*FCM, where FCM is equal to one.

(3) Procedure 3 applies to nonionic organic chemicals with low hydrophobicity defined as log K_{ow} less than (<) 4 and either a low level of documented metabolism in aquatic organisms or lack of sufficient data to characterize metabolism. The acceptable methods are field BAF or lab BCF*FCM, with equal preference given, and K_{ow}*FCM, where FCM is equal to one in both methods.

(4) Procedure 4 applies to nonionic organic chemicals with low hydrophobicity defined as log K_{ow} < 4 and high levels of documented metabolism in aquatic organisms. Equal preference is given to both acceptable methods: field BAF or lab BCF*FCM, where FCM is equal to one.

C. For ionic organic chemicals (defined as chemicals that can readily accept or donate protons) the procedures that define the available hierarchy and appropriate baseline BAF methods depend on further characteristics of the chemical. The main characteristics relate to exhibiting primarily nonionic (neutral) characteristics (ionization is negligible) or ionic characteristic in average surface water pH ranges based on its acid dissociation constant (K_a) expressed as the negative base 10 log (pK_a) and functional group or groups:

(1) When ionization is negligible, the chemical is categorized as a nonionic organic chemical and baseline BAF procedures are applied based on hydrophobicity and metabolism characteristics described for Procedures 1 to 4 under item B, subitems (1) to (4).

(2) In all other cases, the chemical is categorized with inorganic and organometallic chemicals and addressed with Procedure 5 or 6 under item D, subitem (1) or (2).

Available chemical-specific data that supports more defensible baseline BAF methods must be used in place of these default assignments.

D. Inorganic and organometallic chemicals are defined as inorganic minerals, other inorganic chemicals, and elements: metals and metalloids and organometallic chemicals, and Procedures 5 and 6 define the use of acceptable baseline BAF methods. Procedures 5 and 6 are distinguished by the determination of whether the chemical demonstrates biomagnifications through field BAF or laboratory BCF studies, with BAF or BMF greater than 1,000 being the cut-off for this purpose. BMF is calculated using chemical concentrations in the tissue of aquatic organisms at two successive trophic levels as:

$$BMF_{(TL,\ n)} = C_{t\ (TL,\ n)} / C_{t\ (TL,\ n-1)}$$

where: $C_{t\ (TL,\ n)}$ = total concentration of relevant chemical form or forms in appropriate tissue of predator organism at trophic level "n" (may be either wet weight or dry weight concentration so long as both the predator and prey concentrations are expressed in the same manner) (µg/kg)

$C_{t\ (TL,\ n-1)}$ = total concentration of relevant chemical form or forms in appropriate tissue of prey organism at the next lower trophic level from the predator (may be either wet weight or dry weight concentration so long as both the predator and prey concentrations are expressed in the same manner) (µg/kg)

(1) Procedure 5 applies when geometric mean BAF or BMF is less than or equal to 1,000 when comparing successive trophic level ratios up through trophic level 4. Equal preference is given to field BAF or lab BCF*FCM, where FCM is equal to one. For this procedure, field BAF or lab BCF is applied as the baseline BAF.

measured $BAF^{t}_{T} = C_t/C_w$ or $BCF^{t}_{T} = C_t/C_w$ are applied as the baseline BAF.

where: Variables as defined under subpart 8

(2) Procedure 6 applies when geometric mean BAF or BMF is greater than 1,000 when comparing successive trophic level ratios up through trophic level 4. The acceptable methods are field BAF or lab BCF*FCM, with preference for field BAF. For this procedure, field BAF or lab BCF is applied as the baseline BAF.

measured $BAF^{t}_{T} = C_t/C_w$ or $BCF^{t}_{T} = C_t/C_w$ are applied as the baseline BAF.

where: Variables as defined under subpart 8

Subp. 10. **Species mean baseline BAF.** Calculate species and mean baseline BAF from acceptable individual baseline BAF.

A. For each appropriate baseline BAF method, calculate species-mean baseline BAF using the geometric mean.

B. Any baseline BAF with large differences between species (greater than ten percent) needs additional justification for use in a species-mean baseline BAF.

C. Evaluate data uncertainties for consideration in method hierarchy application for calculating trophic level baseline BAF.

Subp. 11. **Final baseline BAF by trophic level.** Determine the final baseline BAF by trophic level (TL):

A. Calculate geometric mean baseline BAF for TL_3 and TL_4 using available species-means for each baseline BAF method. For Class 2A water, preference is given for *Salmonidae* data and developed as a single representative TL_4 baseline BAF for cold-water aquatic communities.

B. Combine species-means for methods that have equal preference in procedural hierarchies and have similarly reliable baseline BAF based on evaluation of data uncertainties for a final baseline BAF for TL_3 where applicable, and final baseline BAF for TL_4.

C. For some pollutants, TL_3 and TL_4 baseline BAF may be identical when not dependent on trophic level factors, such as lipid partitioning.

Subp. 12. **Final state or site BAF by trophic level.** Calculate final state or site BAF for TL_3 where applicable and TL_4 for use in developing human health-based chronic criteria or standards.

A. For nonionic organic chemicals and ionic organic chemicals with no or negligible ionization as defined under subpart 7, for each TL_3 and TL_4, calculate a state or site BAF using the following equation:

$$\text{state or site BAF}_{(TL\ n)} = \left[\left(\text{final baseline BAF}_l^{fd}\right)_{TL\ n} \times (f_l)_{TL\ n} + 1\right] \times (f_{fd})$$

where: $(\text{final baseline BAF}_{l}^{fd})_{TL\ n}$ = final trophic-level-mean baseline BAF expressed on a freely dissolved and lipid-normalized basis for trophic level "n" (L/kg)

$(f_l)_{TL\ n}$ = lipid fraction of aquatic species consumed at trophic level "n" by Class 2 subclass: Class 2A = 0.06; Class 2Bd/2B/2C/2D = 0.02 for TL_3 and 0.015 for TL_4

f_{fd} = fraction of the total chemical in water that is freely dissolved in ambient waters

The default DOC and POC values for the state ambient Class 2 surface waters are 7.5 x 10^{-6} kg/L (7.5 mg/L) and 5 x 10^{-7} kg/L (0.5 mg/L), respectively. For a site BAF for use in site-specific criteria development, the DOC and POC values are from the site monitoring data, if available; in all other cases, the state defaults are used.

B. For inorganic and organometallic chemicals and ionic organic chemicals with ionization in natural waters, the baseline BAF^{t}_{T} using total chemical concentrations or bioavailable forms are directly applied as the state or site BAF:

$$\text{state BAF}_{(TL\ n)} \text{ or site BAF} = \text{final baseline BAF}_{(TL\ n)}$$

Subp. 13. **Algorithms for Class 2A or 2Bd surface waters.** This subpart describes human health-based criteria or standards for classes of surface waters designated for drinking water, fish consumption, and recreational use. To develop a final chronic criteria (CC_{dfr}) or standard (CS_{dfr}) applicable to surface waters designated Class 2A or 2Bd, items A to D must be evaluated for use based on the pollutant's toxicological profile: noncarcinogen or nonlinear carcinogen (NLC); developmental susceptibility; or linear carcinogen (C).

A. Algorithm for noncarcinogenic or NLC chemicals applicable to surface waters designated Class 2A or 2Bd to calculate: CC_{dfr} or CS_{dfr} =

$$\frac{RfD_{chronic}\ (\text{mg/kg-d}) \times RSC\ (\text{no units}) \times 1{,}000\ \mu\text{g/mg}}{\{DWIR_{chronic}\ (\text{L/kg-d}) + FCR_{adult}\ (\text{kg/kg-d})[(0.24 \times BAF_{TL3}\ (\text{L/kg})) + (0.76 \times BAF_{TL4}\ (\text{L/kg})]\}}$$

where: CC_{dfr} or CS_{dfr} = drinking water plus fish consumption and recreation chronic criterion or standard in µg/L

$RfD_{chronic}$ = reference dose for chronic duration in mg/kg-day

RSC = relative source contribution factor

1,000 µg/mg = a factor used to convert milligram (mg) to microgram (µg); there are 1,000 micrograms per milligram

$DWIR_{chronic}$ = drinking water intake rate for the chronic duration based on a 95^{th} percentile time-weighted average from MDH; rate may be chemical-specific with sufficient data or use the default rate of 0.043 L/kg-d

FCR_{adult} = fish consumption intake rate of 0.00043 kg/kg-d based on 0.030 kg/day of amount of fish assumed to be consumed per day and 70 kg adult body weight or rate may be chemical-specific with sufficient data

BAF_{TL3} = final BAF for TL_3 fish in L/kg; accounts for 24 percent of fish consumed

BAF_{TL4} = final BAF for TL_4 fish in L/kg; accounts for 76 percent of fish consumed; for Class 2A, the BAF_{TL4} is applied to 100 percent of the FCR

B. Supplemental algorithm for developmental susceptibility for noncarcinogenic or NLC chemicals applicable to surface waters designated Class 2A or 2Bd to calculate:

CC_{dev} or CS_{dev} =

$$\frac{RfD_{duration\_(acute,\ short\text{-}term,\ or\ subchronic)}\ \text{(mg/kg-d)} \times RSC\ \text{(no units)}}{DWIR_{duration\_(acute,\ short\text{-}term,\ or\ subchronic)}\ \text{(L/kg-d)}}$$

where: CC_{dev} or CS_{dev} = developmental-based drinking water chronic criterion or standard in µg/L applied when shorter duration adverse effects and exposure parameters result in a more stringent chronic criterion or standard than calculated from item A

$RfD_{duration}$ = reference dose for acute, short-term, or subchronic duration in mg/kg-day

$DWIR_{duration}$ = drinking water intake rate for acute, short-term, or subchronic duration in L/kg-d; drinking water intake rate for the acute, short-term, and subchronic durations based on a 95th percentile time-weighted average from MDH; rate may be chemical-specific with sufficient data or use default rates of 0.289, 0.289, and 0.077 L/kg-d, respectively

Other variables as defined under item A

C. Algorithm for linear carcinogenic chemicals with lifetime adjustment factors ($AF_{lifetime}$) applicable to surface waters designated Class 2A or 2Bd to calculate: CC_{dfr} or CS_{dfr} =

$$\frac{CR\ (1 \times 10^{-5})}{CSF(mg/kg\text{-}d)^{-1} \times AF_{Lifetime}} \times \frac{1000\ \mu g/mg}{\{DWIR_{Lifetime}(L/kg\text{-}d) + FCR_{Adult}(kg/kg\text{-}d)[(0.24 \times BAF_{TL3}(L/kg)) + (0.76 \times BAF_{TL4}(L/kg))]\}}$$

where: CC_{dfr} or CS_{dfr} = drinking water plus fish consumption and recreation chronic criterion or standard in µg/L

CR = cancer risk level or an additional excess cancer risk equal to 1 x 10^{-5} (1 in 100,000)

CSF = cancer potency slope factor in $(mg/kg\text{-}d)^{-1}$

$AF_{lifetime}$ = adjustment factor, lifetime (no units)

$DWIR_{lifetime}$ = drinking water intake rate for lifetime duration; drinking water intake rate for the lifetime duration based on a 95th percentile time-weighted average from MDH; rate may be chemical-specific with sufficient data or use default rate of 0.043 L/kg-d

Other variables as defined under item A

D. Algorithm for linear carcinogenic chemicals with age-dependent adjustment factors (ADAF) applicable to surface waters designated Class 2A or 2Bd to calculate: CC_{dfr} or CS_{dfr} =

$$\frac{CR\ (1 \times 10^{-5}) \times 1000}{\left(\begin{array}{l}\left\{CSF \times ADAF_{<2} \times D_{<2} \times [DWIR_{<2} + FCR_{<2} \times (0.24BAF_{TL3} + 0.76BAF_{TL4})]\right\} + \\ \left\{CSF \times ADAF_{2\ to\ <16} \times D_{2to<16} \times [DWIR_{2to<16} + FCR_{2\ to<16} \times (0.24BAF_{TL3} + 0.76BAF_{TL4})]\right\} + \\ \left\{CSF \times ADAF_{16to70} \times D_{16to70} \times [DWIR_{16to70} + FCR_{Adult} \times (0.24BAF_{TL3} + 0.76BAF_{TL4})]\right\}\end{array}\right) /70yrs}$$

where: CC_{dfr} or CS_{dfr} = drinking water plus fish consumption and recreation chronic criterion or standard in µg/L

ADAF = age-dependent adjustment factor by age groups

D = duration corresponding to the three age groups: birth up to two years of age (two-year duration), two years of age up to 16 years of age (14-year duration), and 16 years of age up to 70 years of age (54-year duration)

DWIR = drinking water intake rate for age groups; drinking water intake rate for the lifetime duration based on a 95th percentile time-weighted average from MDH; rate may be chemical-specific with sufficient data or use default rates for:

$DWIR_{0<2}$ = 0.137 L/kg-d, birth up to two years of age

$DWIR_{2 \text{ to } < 16}$ = 0.047 L/kg-d, two up to 16 years of age

$DWIR_{16 \text{ to } 70}$ = 0.039 L/kg-d, 16 up to 70 years of age

FCR = fish consumption intake rate by age groups:

$FCR_{0<2}$ = 0.00086 kg/kg-d

$FCR_{2 \text{ to } < 16}$ = 0.00055 kg/kg-d

$FCR_{16 \text{ to } 70}$ = 0.00043 kg/kg-d

Subp. 14. **Algorithm for Class 2B, 2C, or 2D surface waters.** This subpart describes human health-based criteria or standards for classes of surface waters designated for fish consumption and recreational use (nondrinking water use). To develop a final chronic criteria (CC_{fr}) or standard (CS_{fr}) applicable to surface waters designated Class 2B, 2C, or 2D, items A to C must be evaluated for use based on the pollutant's toxicological profile: noncarcinogen or nonlinear carcinogen (NLC) or linear carcinogen (C).

A. Algorithm for noncarcinogenic or NLC chemicals applicable to Class 2B, 2C, or 2D surface waters to calculate: CC_{fr} or CS_{fr} =

$$\frac{RfD_{chronic} \text{ (mg/kg-d) x RSC (no units) x 1,000 µg/mg}}{\{IWR_{chronic} \text{ (L/kg-d)} + FCR_{adult} \text{ (kg/kg-d)}[(0.24 \text{ x } BAF_{TL3} \text{ (L/kg)}) + (0.76 \text{ x } BAF_{TL4} \text{ (L/kg)}]\}}$$

where: CC_{fr} or CS_{fr} = fish consumption and recreation chronic criterion or standard in µg/L

$IWR_{chronic}$ = 0.0013 L/kg-d; assumed incidental water intake rate based on minimum chronic duration

Other variables as defined under subpart 13

B. Algorithm for linear carcinogenic chemicals with lifetime adjustment factors ($AF_{lifetime}$) applicable to surface waters designated Class 2B, 2C, or 2D to calculate: CC_{fr} or CS_{fr} =

$$\frac{CR\ (1 \times 10^{-5})}{CSF(\text{mg/kg-d})^{-1} \times AF_{Lifetime}} \times \frac{1000\ \mu g/mg}{\{IWR_{chronic}\ (L/kg\text{-d}) + FCR_{Adult}\ (kg/kg\text{-d})\left[(0.24 \times BAF_{TL3}\ (L/kg)) + (0.76 \times BAF_{TL4}(L/kg))\right]\}}$$

where: CC_{fr} or CS_{fr} = fish consumption and recreation chronic criterion or standard in µg/L

Other variables as defined under item A and subpart 13

C. Algorithm for linear carcinogenic chemicals with age-dependent adjustment factors (ADAF) applicable to surface waters designated Class 2B, 2C, or 2D to calculate: CC_{fr} or CS_{fr} =

$$\frac{CR\ (1 \times 10^{-5}) \times 1000}{\left(\begin{array}{l}\left\{CSF \times ADAF_{<2} \times D_{<2} \times [IWR + FCR_{<2} \times (0.24BAF_{TL3} + 0.76BAF_{TL4})]\right\} + \\ \left\{CSF \times ADAF_{2\ to\ <16} \times D_{2\ to\ <16} \times [IWR + FCR_{2\ to\ <16} \times (0.24BAF_{TL3} + 0.76BAF_{TL4})]\right\} + \\ \left\{CSF \times ADAF_{16\ to\ 70} \times D_{16\ to\ 70} \times [IWR + FCR_{Adult} \times (0.24BAF_{TL3} + 0.76BAF_{TL4})]\right\}\end{array}\right) / 70yrs}$$

where: CC_{fr} or CS_{fr} = fish consumption and recreation chronic criterion or standard in µg/L

Other variables as defined under item A and subpart 13

Subp. 15. **Algorithms for Class 2 fish tissue.** This subpart describes algorithms and fish tissue criteria (CC_{ft}) and standards (CS_{ft}) for chemical with BAF greater than 1,000 (BCC threshold) applicable to Class 2 surface waters. Items A to C must be evaluated for

use based on the pollutant's toxicological profile: noncarcinogen or nonlinear carcinogen (NLC) or linear carcinogen (C).

A. Algorithm for noncarcinogenic or NLC chemicals applicable to Class 2 surface waters to calculate: CC_{ft} or CS_{ft} =

$$\frac{RfD_{chronic}\text{ (mg/kg-d) x RSC (no units) or - RSC (mg/kg-d)}}{FCR_{adult}\text{ (kg/kg-d)}}$$

where: CC_{ft} or CS_{ft} = fish tissue-based chronic criterion or standard in mg/kg
Other variables as defined under subpart 13

B. Algorithm for linear carcinogenic chemicals with lifetime adjustment factors ($AF_{lifetime}$) applicable to Class 2 surface waters to calculate: CC_{ft} or CS_{ft} =

$$\frac{CR\ (1 \times 10^{-5})}{CSF\text{ (mg/kg-d)}^{-1} \times AF_{lifetime}\text{ (no units)}} \times \frac{1}{FCR_{Adult}\text{ (kg/kg-d)}}$$

where: CC_{ft} or CS_{ft} = fish tissue-based chronic criterion or standard in mg/kg
Other variables as defined under subpart 13

C. Algorithm for linear carcinogenic chemicals with age-dependent adjustment factors (ADAFs) applicable to Class 2 surface waters to calculate: CC_{ft} or CS_{ft} =

$$\frac{CR\ (1 \times 10^{-5})}{\left[\frac{(CSF \times ADAF_{<2} \times D_{0\text{-}2} \times FCR_{<2}) + (CSF \times ADAF_{2\text{-}16} \times D_{2\text{-}16} \times FCR_{2\text{-}16}) + (CSF \times ADAF_{16\text{-}70} \times D_{16\text{-}70} \times FCR_{16\text{-}70})}{70\text{ years}}\right]}$$

where: CC_{ft} or CS_{ft} = fish tissue-based chronic criterion or standard in mg/kg
Other variables as defined under subpart 13

7050.0222 SPECIFIC WATER QUALITY STANDARDS FOR CLASS 2 WATERS OF THE STATE; AQUATIC LIFE AND RECREATION.

[For text of subps 1 to 6, see M.R.]

Subp. 7. **Additional standards; Class 2 waters.** The following additional standards and requirements apply to all Class 2 waters.

[For text of items A and B, see M.R.]

C. To prevent chronically toxic conditions, concentrations of toxic pollutants must not exceed the applicable CS or CC and MS or MC in surface waters outside allowable mixing zones as described in part 7050.0210, subpart 5. The CS or CC and MS or MC will be averaged over the following durations: the MS or MC will be a one-day average; the CS or CC, based on toxicity to aquatic life, will be a four-day average; and the CS or CC, based on human health and applied in water or wildlife toxicity, will be a 30-day average.

D. Concentrations of noncarcinogenic or nonlinear carcinogenic (NLC) chemicals in water or fish tissue from point or nonpoint sources, singly or in mixtures, must be below levels expected to produce known adverse effects. This is accomplished through the application of an additive noncancer health risk index using common health risk index endpoints or health endpoints. Mixtures of chemicals with listed CS or site-specific CC are evaluated using the following approach:

Chemicals must be grouped according to medium (water or fish) and each health endpoint. Chemicals for which no health endpoint is specified are not grouped. Chemicals that are also linear carcinogens must be grouped as described under item E. Using the following equation, a noncancer health risk index must be determined for each group of two or more chemicals that have a common health endpoint listed in this part. To meet the protection objectives in part 7050.0217, the noncancer health risk index must not exceed a value of one.

$$\text{Noncancer health risk index by common health endpoint} = \frac{C_1}{CS_1} + \frac{C_2}{CS_2} + \ldots + \frac{C_n}{CS_n} \leq 1$$

where: C_n is the concentration of the first to the n^{th} chemical by common health endpoint and medium

$CS_1 \ldots CS_n$ is the drinking water plus fish consumption and recreation chronic standard (CS_{dfr} or CS_{dev}), fish consumption and recreation chronic standard (CS_{fr}), or fish tissue chronic standard (CS_{ft}) for the first to n^{th} chemical by common health endpoint

$CC_1 \ldots CC_n$ is the drinking water plus fish consumption and recreation criterion (CC_{dfr} or CC_{dev}), fish consumption and recreation criterion (CC_{fr}), or fish tissue criterion (CC_{ft}) for the first to n^{th} chemical by common health endpoint

~~D.~~ E. Concentrations of carcinogenic chemicals from point or nonpoint sources, singly or in mixtures, ~~should~~ must not exceed ~~a~~ an incremental or additional excess risk level of one ~~chance~~ in 100,000 (10^{-5}) in surface waters or fish tissue. Carcinogenic chemicals will be considered additive in their effect according to the following equation unless an alternative model is supported by available scientific evidence. The additive equation applies to chemicals that have a human health-based standard calculated with a cancer potency slope factor. To meet the protection objectives in part 7050.0217, the cancer health risk index must not exceed a value of one.

~~$\frac{C_1}{CC_1} + \frac{C_2}{CC_2} + \ldots + \frac{C_n}{CC_n}$ equals a value of one or more, a risk level greater than 10^{-5} is indicated~~

$$\text{Cancer health risk index} = \frac{C_1}{CS_1} + \frac{C_2}{CS_2} + \ldots + \frac{C_n}{CS_n} \leq 1$$

where: C_1 .... C_n is the concentration of the first to the n^{th} carcinogen~~.~~ in water or fish tissue

CS_1 ... CS_n is the drinking water plus fish consumption and recreation chronic standard (CS_{dfr}), fish consumption and recreation chronic standard (CS_{fr}), or fish tissue chronic standard (CS_{ft}) for the first to n^{th} carcinogenic chemical

CC_1 .... CC_n is the drinking water plus fish consumption criterion ~~(CC_{df}) or~~ (CC_{dfr}) fish consumption and recreation criterion (~~CC_f~~ CC_{fr}), or fish tissue criterion (CC_{ft}) for the first to n^{th} carcinogenic chemical~~.~~

F. When monitoring indicates that chemical breakdown products or environmental degradates are present in surface water or fish tissue, those products must be considered when meeting the objectives for toxic pollutants in part 7050.0217. When no human health-based CS or other MDH health-based guidance is available for the chemical breakdown product, the CS or CC for the parent chemical must be applied for that product. The parent CS or CC must also be applied to evaluate mixtures of chemicals.

~~E.~~ G. ~~The provisions of~~ This item ~~apply~~ applies to maximum standards (MS), final acute values (FAV), and double dashes (–) in this part and part 7050.0220 marked with an asterisk (*). For carcinogenic or highly bioaccumulative chemicals with BCFs greater than 5,000 or log K_{ow} values greater than 5.19, the human health-based chronic standard (CS) may be two or more orders of magnitude smaller than the acute toxicity-based MS. ~~If the commissioner finds that a very large MS and FAV, relative to the CS for such pollutants is not protective of the public health, the MS and FAV shall be reduced according to the following guidelines:~~

If the ratio of the MS to the CS is greater than 100, the CS times 100 ~~should~~ must be substituted for the applicable MS, and the CS times 200 ~~should~~ must be substituted for the applicable FAV. Any effluent limit derived using the procedures of this item ~~shall~~ must only be required after the discharger has been given notice of the specific proposed effluent limits and an opportunity to request a hearing as provided in part 7000.1800.

[For text of subps 8 and 9, see M.R.]

7052.0005 SCOPE.

A. This chapter establishes aquatic life, human health, and wildlife water quality standards and criteria for Great Lakes Initiative (GLI) pollutants; nondegradation standards for surface waters of the state in the Lake Superior Basin including, on a limited basis as described in item B, Class 7 waters; and implementation procedures for deriving effluent limitations from these standards and criteria. Other water quality standards, nondegradation standards, and implementation procedures applicable to the surface waters of the state in the Lake Superior Basin can be found in ~~chapters~~ chapter 7050 and ~~7065~~ in parts 7052.0100, subpart 1, items A to G, and 7053.0255.

[For text of item B, see M.R.]

7052.0010 DEFINITIONS.

[For text of subps 1 to 10, see M.R.]

Subp. 11. **Criterion.** "Criterion" means a number or numbers established for a pollutant derived under parts 7050.0218, 7050.0219, 7052.0110, or issued by the EPA, to protect aquatic life, humans, or wildlife.

[For text of subps 12 to 20, see M.R.]

Subp. 21. **GLI pollutant.** "GLI pollutant" means a toxic pollutant or chemical listed as a pollutant of initial focus in the GLI Guidance, Code of Federal Regulations, title 40, part 132, Table 6, as amended ~~through March 12, 1997~~.

[For text of subps 22 to 39, see M.R.]

Subp. 40. **Tier I.** "Tier I" means the methods referenced in part 7052.0110 for developing aquatic life~~, human health,~~ and wildlife standards or criteria.

Subp. 41. **Tier II.** "Tier II" means the methods referenced in part 7052.0110 for developing aquatic life ~~and human health~~ standards or criteria when there is not a set of data available that meets Tier I data requirements.

[For text of subps 42 to 45, see M.R.]

7052.0100 WATER QUALITY STANDARDS.

Subpart 1. **Applicability.**

A. The ambient water quality standards in subparts 2 to 6 are Class 2 standards for the protection of aquatic life, human health, and wildlife from the GLI pollutants. The numeric standard for a GLI pollutant includes the CS, MS, and FAV. Some pollutants do not have an MS or an FAV because of insufficient data. For these pollutants, the CS is the numeric standard. Additional standards applicable to the surface waters of the state in the Lake Superior Basin are found in ~~chapters~~ chapter 7050 ~~and 7065~~, including standards applicable to drinking water sources, which are listed in parts 7050.0220 and 7050.0221.

B. Some of the GLI pollutants listed in subparts 2 to 6 have both aquatic life and human health standards and four of the GLI pollutants have wildlife standards, as provided in tables 1 to 4 of the GLI Guidance. These standards are listed in subparts 2 to 6 to facilitate implementation of the standards under parts 7052.0200, subpart 3, and 7052.0210, subpart 1. The most stringent chronic aquatic life, human health, or wildlife standard listed is the applicable standard except when a less stringent chronic or maximum standard applies when setting an effluent limitation under part 7052.0200, subpart 3. For any aquatic life, human health, or wildlife chronic standard, a blank space in subparts 2 to 5 means no GLI standard is available and the most stringent listed chronic standard is applicable. For the aquatic life MS and FAV, blank spaces mean the GLI guidance lists no MS or FAV, and part 7050.0222 may contain an applicable MS or FAV.

C. The definitions and methods for human health-based chronic standards and site-specific chronic criteria in parts 7050.0217 to 7050.0219 are incorporated by reference and are further described in part 7052.0110, subpart 4.

D. The Class 2A human health-based chronic standards listed in chapter 7050 are incorporated by reference as modified by the procedures in part 7052.0110, subpart 3.

E. The *Escherichia (E.) coli* water quality standards in Code of Federal Regulations, title 40, section 131.41, Table (c)(1), that apply to coastal recreation waters are incorporated by reference as:

(1) *E. coli* bacteria must not exceed 126 organisms per 100 milliliters, as a geometric mean of not less than five samples representative of conditions during any calendar month; or

(2) *E. coli* bacteria must not exceed 235 organisms per 100 milliliters in more than ten percent of all the individual samples taken during any calendar month.

The *E. coli* standard under this item applies only between April 1 and October 31.

F. Standards for metals are expressed as total metal but must be implemented as dissolved metal standards. Conversion factors for converting total to dissolved metal standards are listed in part 7052.0360, and applied under part 7052.0200, subpart 4. The conversion factor for metals not listed in part 7052.0360 is one. Standards for GLI pollutants followed by (TH) or (pH) vary with total hardness or pH. The formulas for these standards are found in subpart 6.

G. The CS and MS are averaged over the following durations:

(1) the MS is a one-day average;

(2) the CS, based on toxicity to aquatic life, is a four-day average; and

(3) the CS applied in water, based on human health or wildlife toxicity, is a 30-day average.

[For text of subps 2 to 6, see M.R.]

7052.0110 METHODOLOGIES FOR DEVELOPMENT OF ~~TIER I AND TIER II~~ STANDARDS AND CRITERIA, AND BIOACCUMULATION FACTORS.

Subpart 1. **Applicability.** This part identifies the methods that must be used to develop aquatic life and wildlife-based Tier I and Tier II standards and criteria and human

health-based chronic standards and criteria. Subparts 3 and 4 also list exceptions to some of the assumptions used in the GLI Guidance methods. These exceptions are based on Minnesota-specific data.

[For text of subp 2, see M.R.]

Subp. 3. **Bioaccumulation factors.** Bioaccumulation factors (BAFs) for calculating human health and wildlife standards were developed and BAFs for calculating criteria must be developed using the methodology provided by Code of Federal Regulations, title 40, part 132, Appendix B, entitled "Great Lakes Water Quality Methodology for Deriving Bioaccumulation Factors," as amended through March 12, 1997, which is adopted and incorporated by reference in part 7052.0015, item B, except that for human health standards and criteria, the baseline BAF is multiplied by the following lipid fractions which apply to fish in both trophic levels 3 (TL_3) and 4 (TL_4), except as noted in item C:

A. 0.085 for Lake Superior;

B. 0.06 for Class 2A waters other than Lake Superior; and

C. 0.015 for TL_4 and 0.020 for TL_3 for Class 2B, 2Bd, 2C, and 2D waters.

Subp. 4. **Human health.**

A. ~~All Tier I and Tier II~~ Human health standards listed in part 7052.0100 for benzene, chlordane, chlorobenzene, cyanide (free), DDT, dieldrin, 2,4-dimethylphenol, 2,4-dinitrophenol, hexachlorobenzene, hexachloroethane, lindane, mercury (total), methylene chloride, PCBs, 2,3,7,8-TCDD, toluene, and trichloroethylene were developed ~~and all criteria must be developed~~ using the Tier I methodology provided by Code of Federal Regulations, title 40, part 132, Appendix C, entitled "Great Lakes Water Quality Initiative Methodology for Development of Human Health Criteria and Values," as amended through March 12, 1997, which is adopted and incorporated by reference in part 7052.0015, item C, except that the daily human consumption of fish caught in the Lake

Superior Basin is assumed to be 0.030 kg/day (0.0072 kg/day for ~~trophic level 3~~ TL_3 fish plus 0.0228 kg/day for ~~trophic level 4~~ TL_4 fish).

B. Changes to the standards established for the pollutants in item A or additional human health-based chronic standards or site-specific chronic criteria must be based on the algorithms and methods in parts 7050.0217 to 7050.0219, with site-specific consideration as provided in part 7052.0270, except the bioaccumulation factor methods in part 7052.0110, subpart 3, must be used in place of those listed in part 7050.0219, subpart 6.

C. Concentrations of noncarcinogenic or nonlinear carcinogenic (NLC) chemicals in water or fish tissue from point or nonpoint sources, singly or in mixtures, must be below levels expected to produce known adverse effects. This is accomplished through the application of an additive noncancer health risk index using common health risk index endpoints or health endpoints as described in part 7050.0222, subpart 7, item D. Concentrations of carcinogenic chemicals from point or nonpoint sources, singly or in mixtures, must not exceed an incremental or additional excess risk level of one in 100,000 (10^{-5}) in surface waters. The combined risk from mixtures of linear carcinogens (C) is determined as described in part 7050.0222, subpart 7, item E.

[For text of subp 5, see M.R.]

7052.0220 REASONABLE POTENTIAL FOR CHEMICAL-SPECIFIC WQBELS.

[For text of subp 1, see M.R.]

Subp. 2. **Developing preliminary effluent limitations.** The first step in a reasonable potential determination is to calculate a PEL. The procedures in parts 7052.0200 and 7052.0210 must be used to determine a PEL from a ~~Tier I or Tier II~~ standard or criterion. If the agency determines that there are insufficient data to calculate a standard or criterion, the procedure in subpart 4 must be followed to determine if data must be generated to calculate a ~~Tier II~~ standard or site-specific criterion.

[For text of subp 3, see M.R.]

Subp. 4. **Developing data for calculating Tier II ~~noncancer human health and~~ aquatic life standards and criteria or noncancer human health-based standards or site-specific criteria.** This subpart applies when the agency determines that insufficient data currently exist to calculate aquatic life toxicity-based Tier II or human health-based standards or criteria for GLI pollutants known to be in the discharge, or suspected to be in the discharge based on knowledge of the raw materials used or internal process or waste streams.

[For text of item A, see M.R.]

B. Using the provisions in parts 7052.0200 and 7052.0210, the agency must develop PELs based on the estimated ambient screening criteria and compare the PELs with each PEQ developed under subpart 3. If the PEQ exceeds the PEL for any GLI pollutant, the agency must generate or require the permittee to generate the data necessary to derive ~~Tier H~~ standards or site-specific criteria to protect human health from noncancer effects and aquatic life from acute and chronic effects using the methods in part 7052.0110 with site-specific consideration as provided in part 7052.0270.

C. The agency must use the data generated according to item B to calculate ~~Tier H~~ standards and site-specific criteria according to the methods in part 7052.0110. The derived ~~Tier H~~ standards and criteria must be used to calculate PELs to determine if an effluent limitation must be established in the permit. If the PEQ exceeds the PEL for any GLI pollutant, an effluent limitation must be established in the permit.

[For text of item D, see M.R.]

[For text of subps 5 to 7, see M.R.]

7052.0230 ADDITIVITY.

[For text of subp 1, see M.R.]

Subp. 2. **Carcinogenic human health GLI pollutant additivity.** The agency must calculate the additive effects of carcinogenic human health pollutants in effluents according to part 7050.0222, subpart 7, item ~~D~~ E, for which individual WQBELs have been established under part 7052.0200, subpart 5. Cumulative incremental risk for carcinogens in the effluent must be maintained at 1×10^{-5} or less.

Subp. 3. **Noncarcinogenic human health GLI pollutant additivity.** The agency must determine the additive effects of noncarcinogenic human health pollutants where individual WQBELs have been established under part 7052.0200, subpart 5, and where the pollutants exhibit the same adverse effects through the same mechanisms of action as established through the use of health risk index endpoints or health endpoints according to part 7050.0222, subpart 7, item D.

[For text of subps 4 and 5, see M.R.]

REPEALER. Minnesota Rules, part 7050.0218, subparts 6 and 7, are repealed.