Title 10--DEPARTMENT OF NATURAL RESOURCES
Division 20--Clean Water Commission
Chapter 7--Water Quality

10 CSR 20-7.031 Water Quality Standards

PURPOSE: This rule identifies uses of waters of the state, criteria to protect those uses, and defines the ant idegradation policy. It is developed in response to the Missouri Clean Water Law and the federal Clean Water Act, Section 303(c)(1) and (2), which requires that state water quality standards be reviewed at least once every three (3) years. These revisions are pursuant to the national goal of protection of fish, shellfish, and wildlife and recreation in and on the water as outlined in Section 101(a) (2) of the Act.

PUBLISHER'S NOTE: The secretary of state has determined that the publication of the entire text of the material which is incorporated by reference as a portion of this rule would be unduly cumbersome or expensive. This material as incorporated by reference in this rule shall be maintained by the agency at its headquarters and shall be made available to the public for inspection and copying at no more than the actual cost of reproduction. This note applies only to the reference material. The entire text of the rule is printed here.

(1) Definitions.

(A) Acute toxicity—Conditions producing adverse effects or lethality on aquatic life following short-term exposure. The acute criteria in Tables A and B are maximum concentrations which protect against acutely toxic conditions. Acute toxicity is also indicated by exceedence of whole-effluent toxicity (WET) test conditions of paragraph (4)(I)2. For substances not listed in Table A or B, three -tenths (0.3) of the median lethal concentration, or the no observed acute effect concentration for representative species, may be used to determine absence of acute toxicity.

(B) Aquifer—A subsurface water -bearing bed or stratum which stores or transmits water in recoverable quantities that is currently being used or could be used as a water source for private or public use. It does not include water in the vadose zone.

(C) Designated uses —Uses specified for each water body whether or not they are being attained. Uses are designated according to section (2) of this rule and include, but are not limited to—

1. Protection and propagation of fish, shellfish and wildlife. Str eams will be designated to one of the following aquatic habitat protection uses based on watershed size, scale within the stream network and other hydrological and physical data. La kes and reservoirs will be designated to one of the following aquatic habit at protection uses based on limnological characteristics (such as temperature) and biological assemblages.

A. Warm Water Habitat (WWH) —Waters in which naturally -occurring water quality and habitat conditions allow the maintenance of a wide variety of warm-water biota.*[—]*

(I) *[Warm water habitat (]*Great River*[)];]*
(II) *[Warm water habitat (]*Large River*[)];]*
(III) *[Warm water habitat (]*Small River*[)];]*
(IV) *[Warm water habitat (]*Creek*[)];]*
(V) *[Warm water habitat (]*Headwater*[)*; and*]*
(VI) *[Warm water habitat (]*Lake or reservoir*[).]*

B. Cool Water Habitat (CLH) —Waters in which naturally -occurring water quality and habitat conditions allow the maintenance of a wide variety of cool -water biota. These waters can support a sensitive, high -quality sport fishery (i.e., smallmouth bass and rock bass).*[—]*

(I) *[Cool water habitat (]*Large River*[)];]*
(II) *[Cool water habitat (]*Small River*[)];]*
(III) *[Cool water habitat (]*Creek*[)];]*
(IV) *[Cool water habitat (]*Headwater*[)*; and*]*
(V) *[Cool water habitat (]*Lake or reservoir*[).]*

C. Cold Water Habitat (CDH) —Waters in which naturally -occurring water quality and habitat conditions allow the maintenance of a wide variety of cold -water biota. These waters can support a naturally reproducing or stocked trout fishery and populations of other cold-water species.*[—]*

(I) *[Cold water habitat (]*Large River*[)];]*
(II) *[Cold water habitat (]*Small River*[)];]*
(III) *[Cold water habitat (]*Creek*[)];]*
(IV) *[Cold water habitat (]*Headwater*[)*; and*]*
(V) *[Cold water habitat (]*Lake or reservoir*[).]*

D. Ephemeral Aquatic Habitat (EAH)—Waters having surface flow or pools in response to precipitation events or snow melt, but without permanent surface flow or permanent pools; naturally-occurring water quality and habitat conditions may allow the maintenance of a limited or transient community of aquatic biota.

E. Modified Aquatic Habitat (MAH) —Waters in which natural habitat conditions have been physically, chemically or biologically modified; habitat and resulting water quality conditions may prevent the maintenance of a wide variety or diversity of aquatic biota.

F. Limited Aquatic Habitat (LAH)—Waters in which natural habitat conditions have been substantially and irretrievably altered; habitat and resulting water quality conditions do not allow maintenance of aquatic biota, or if present, the community is of poor variety or diversity.

2. Recreation in and on the water. Assignment of these uses does not grant an individual the right to trespass.

A. Whole body contact recreation (WBC)—Activities involving direct human contact with waters of the state to the point of complete body submergence. The water may be ingested accidentally and certain sensitive body organs, such as the eyes, ears, and the nose, will be exposed to the water. Although the water may be ingested accidentally, it is not intended to be used as a potable supply unless acceptable treatment is applied. Waters so designated are intended to be used for swimming, water skiing, or skin diving.

(I) Category A (WBC-A)—This category applies to waters that have been established by the property owner as public swimming areas welcoming access by the public for swimming purposes and waters with documented existing whole body contact recreational use(s) by the public. Examples of this category include, but are not limited to: public swimming beaches and property where whole body contact recreational activity is open to and accessible by the public through law or written permission of the landowner.

(II) Category B (WBC-B)—This category applies to waters designated for whole body contact recreation not contained within category A.

B. Secondary contact recreation (SCR)—Uses include fishing, wading, commercial and recreational boating, any limited contact incidental to shoreline activities, and activities in which users do not swim or float in the water. These recreational activities may result in contact with the water that is either incidental or accidental and the probability of ingesting appreciable quantities of water is minimal.

3. Human health protection (HHP) —Criteria to protect this use are based on the assumption of an average amount of fish consumed on a long-term basis. Protection of this use includes compliance with Food and Drug Administration (FDA) limits for fish tissue, maximum water concentrations corresponding to the 10^{-6} cancer risk level, and other human health fish consumption criteria.

4. Irrigation (IRR)—Application of water to cropland or directly to cultivated plants that may be used for human or livestock consumption. Occasional supplemental irrigation, rather than continuous irrigation, is assumed.

5. Livestock and wildlife protection (LWP) —Maintenance of conditions in waters to support health in livestock and wildlife.

6. Drinking water supply (DWS) —Maintenance of a raw water supply which will yield potable water after treatment by public water treatment facilities.

7. Industrial water supply (IND) —Water to support various industrial uses; since quality needs will vary by industry, no specific criteria are set in these standards.

8. Storm- and flood-water storage and attenuation (WSA)—Wetlands and other waters which serve as overflow and storage areas during flood or storm events slowly release water to downstream areas, thus lowering flood peaks and associated damage to life and property.

9. Habitat for resident and migratory wildlife species, including rare and endangered species (WHP) —Wetlands and other waters that provide essential breeding, nesting, feeding, and predator escape habitats for wildlife including waterfowl, birds, mammals, fish, amphibians, and reptiles.

10. Recreational, cultural, educational, scientific, and natural aesthetic values and uses (WRC) —Wetlands and other waters that serve as recreational sites for fishing, hunting, and observing wildlife; waters of historic or archaeological significance; waters which provide great diversity for nature observation, educational opportunities, and scientific study.

11. Hydrologic cycle maintenance (WHC)—Wetlands and other waters hydrologically connected to rivers and streams serve to maintain flow conditions during periods of drought. Waters that are connected hydrologically to the groundwater system recharge groundwater supplies and assume an important local or regional role in maintaining groundwater levels.

(D) Biocriteria —Numeric values or narrative expressions that describe the reference biological integrity of aquatic communities inhabiting waters that have been designated for aquatic-life protection.

(E) Chronic toxicity —Conditions producing adverse effects on aquatic life or wildlife following long-term exposure but having no readily observable effect over a short time period. Chronic numeric criteria in Tables A and B are maximum concentrations which protect against chronic toxicity; these values shall be considered four- (4-) day averages, with the exception of total ammonia as nitrogen which shall be considered a thirty- (30-) day average. Chronic toxicity is also indicated by exceedence of WET test conditions of subsection (5)(Q). For substances not listed in Table A or B, commonly used endpoints such as the no-observed effect concentration or inhibition concentration of representative species may be used to demonstrate absence of toxicity.

(F) Class—All waters listed in the Missouri Use Designation Dataset and in Table G and Table H of this rule shall have a hydrologic class. During normal flow periods, some rivers back water into tributaries which do not otherwise have a hydrologic class. These permanent backwater areas are considered to have the same hydrologic class as the water body into which the tributary flows.

1. Class L1—Lakes used primarily for public drinking water supply.

2. Class L2—Major reservoirs.

3. Class L3—Other lakes which are waters of the state. These include both public and private lakes. For effluent regulation purposes, publicly-owned L3 lakes are those for which a substantial portion of the surrounding lands are publicly owned or managed.

4. Class P—Streams that maintain permanent flow even in drought periods.

5. Class P1—Standing-water reaches of Class P streams.

6. Class C—Streams that may cease flow in dry periods but maintain permanent pools which support aquatic life.

7. Class E—Streams that do not maintain permanent surface flow or permanent pools, but have ephemeral surface flow or pools in response to precipitation events.

8. Class W—Wetlands that are waters of the state that meet the criteria in the *Corps of Engineers Wetlands Delineation Manual*, (January 1987), and subsequent federal revisions and supplements . Class W waters do not include wetlands that are artificially created on dry land and maintained for the treatment of mine drainage, stormwater control, drainage associated with road construction, or industrial, municipal, or agricultural waste.

(G) Early life stages of fish—The pre-hatch embryonic period, the post-hatch free embryo or yolk-sac fry, and the larval period during which the organism feeds. Juvenile fish, which are anatomically rather similar to adults, are not considered an early life stage.

(H) Existing uses—Those uses actually attained in the water body on or after November 28, 1975, whether or not they are identified in the water quality standards.

(I) Ecoregion—Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources. They are designed to serve as a spatial framework for the research, assessment, management, and monitoring of ecosystems and ecosystem components. By recognizing the spatial differences in the capacities and potentials of ecosystems, ecoregions stratify the environment by its probable response to disturbance (Bryce, Omernik, and Larsen, 1999).

(J) Epilimnion—Zone of atmospheric mixing in a thermostratified lake.

(K) *Escherichia coli* (*E. coli*)—A type of fecal coliform bacteria found in the intestines of animals and humans. The presence of *E. coli* in water is a strong indication of recent sewage or animal waste contamination. Sewage may contain many types of disease-causing organisms (pathogens).

(L) Hypolimnion—Zone beneath the zone of atmospheric mixing in a thermostratified lake.

(M) Lethal concentration $_{50}$ (LC_{50})—Concentration of a toxicant which would be expected to kill fifty percent (50%) of the individuals of the test species organisms in a test of specified length of time.

(N) Losing stream—A stream which distributes thirty percent (30%) or more of its flow during low flow conditions through natural processes, such as through permeable geologic materials into a bedrock aquifer within two (2) miles' flow distance downstream of an existing or proposed discharge. Flow measurements to determine percentage of water loss must be corrected to approximate the 7Q10 stream flow. If a stream bed or drainage way has an intermittent flow or a flow insufficient to measure in accordance with this rule, it may be determined to be a losing stream on the basis of channel development, valley configuration, vegetation development, dye tracing studies, bedrock characteristics, geographical data, and other geological factors. Losing streams are **identified***[listed]* in **the digital geospatial dataset 'LOSING_STREAM' developed by the Missouri Department of Natural Resources, Missouri Geological Survey** *[Table J]*; additional streams may be determined to be losing by the Missouri Department of Natural Resources.

(O) Low-flow conditions—Where used in this regulation in the context of mixing zones, the low-flow conditions shall refer to the minimum amount of stream flow occurring immediately upstream of a wastewater discharge and available, in whole or in part, for attenuation of wastewater pollutants.

1. Seven- (7-) day, one- (1-) in-ten- (10-) year low flow (7Q10)—The lowest average flow for seven (7) consecutive days that has a probable recurrence interval of once-in-ten (10) years.

2. Sixty- (60-) day, one- (1-) in-two- (2-) year low flow (60Q2)—The lowest average flow for sixty (60) consecutive days that has a probable recurrence interval of once-in-two (2) years.

3. Thirty- (30-) day, one- (1-) in-ten- (10-) year low flow (30Q10)—The lowest average flow for thirty (30) consecutive days that has a probable recurrence interval of once-in-ten (10) years.

4. One- (1-) day, one- (1-) in-ten- (10-) year low flow (1Q10)—The lowest average flow for one (1) day that has a probable recurrence interval of once-in-ten (10) years.

(P) Missouri Use Designation Dataset—A digital geospatial dataset used in conjunction with geographic information systems and maintained by the department. This dataset documents the names and locations of the state's rivers, streams, lakes and reservoirs which have been assigned designated uses. The initial version of this dataset, as adopted on November 6, 2013, reflects Tables G and H plus any additional presumptive uses described in section (2). The dataset will also include information regarding both pending and approved determinations, variances, use attainability analyses and water quality standards revisions. The dataset uses the geospatial framework provided by the National Hydrography Dataset and is enhanced and supported by hydrological and physical information obtained through the Missouri Resource Assessment Partnership (MoRAP) and other scientific sources. The dataset is limited in geographic extent to the state of Missouri.

(Q) Mixing zone—An area of dilution of effluent in the receiving water beyond which chronic toxicity criteria must be met.

(R) National Hydrography Dataset (NHD)—A digital vector dataset used in conjunction with geographic information systems to describe the location of rivers, streams, lakes, reservoirs, and other surface water features. As applied in this rule, the term refers to the 1:100,000 scale dataset generated by the United States Geological Survey. This dataset provides the geospatial framework for the Missouri Use Designation Dataset.

(S) Outstanding national resource waters —Waters which have outstanding national recreational and ecological significance. These waters shall receive special protection against any degradation in quality. Congressionally -designated rivers, including those in the Ozark national scenic riverways and the wild and scenic rivers system, are so designated (see Table D).

(T) Outstanding state resource waters—High quality waters with a significant aesthetic, recreational, or scientific value which are specifically designated as such by the Clean Water Commission (see Table E).

(U) Ozark streams —Streams lying within the Ozark faunal region as described in the *Aquatic Community Classification System for Missouri*, **1989, Aquatic Series No. 19,** Missouri Department of Conservation, **Jefferson City, MO 65109,** *[1989]* **which is hereby incorporated by reference and does not include any later amendments or additions. The department shall maintain a copy of the referenced documents and shall make them available to the public for inspection and copying at no more than the actual cost of reproduction**.

(V) Reference lakes or reservoirs—Lakes or reservoirs determined by Missouri Department of Natural Resources to be the best available representatives of ecoregion waters in a natural condition with respect to habitat, water quality, biological integrity and diversity, watershed land use, and riparian conditions.

(W) Reference stream reaches —Stream reaches determined by the department to be the best available representatives of ecoregion waters in a natural condition, with respect to habitat, water quality, biological integrity and diversity, watershed land use, and riparian conditions.

(X) Regulated-flow streams—A stream that derives a majority of its flow from an impounded area with a flow -regulating device.

(Y) Use Attainability Analysis (UAA)—A structured scientific assessment of the factors affecting the attainment of the use which may include physical, chemical, biological, and economic factors as described in 40 CFR 131.10(g).

(Z) Variance—A temporary modification to 10 CSR 20-7.031 that is deemed necessary in accordance with section (12) of this rule.

(AA) Water effect ratio —Appropriate measure of the toxicity of a material obtained in a site water divided by the same measure of the toxicity of the same material obtained simultaneously in a laboratory dilution water.

(BB) Water hardness—The total concentration of calcium and magnesium ions expressed as calcium carbonate. For purposes of this rule, hardness will be **the median** *[determined by the lower quartile (twenty -fifth percentile)]* value of a representative number of samples from the water *[body]* in question or from *[a]* similar waters *[body]* at the appropriate stream flow conditions **within the same ecoregion**.

(CC) Water quality criteria —Chemical, physical, and biological properties of water that are necessary to protect beneficial water uses.

(DD) Waters of the state —**As defined in section 644.016 RSMo** *[All rivers, streams, lakes, and other bodies of surface and subsurface water lying within or forming a part of the boundaries of the state which are not entirely confined and located completely upon lands owned, leased, or otherwise controlled by a single person or by two (2) or more persons jointly or as tenants in common and includes waters of the United States lying within the state]*.

(EE) Wetlands—Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. This definition is consistent with both the United States Army Corps of Engineers wetlands definition at 33 CFR 328.3(b) and the United States Environmental Protection Agency wetlands definition at 40 CFR 232.2(r).

(FF) Whole effluent toxicity tests —A toxicity test conducted under specified laboratory conditions on specific indicator organisms. To estimate chronic and acute toxicity of the effluent in its receiving stream, the effluent may be diluted to simulate the computed percent effluent at the edge of the mixing zone or zone of initial dilution.

(GG) Zone of initial dilution —A small area of initial mixing below an effluent outfall beyond which acute toxicity criteria must be met.

(HH) Zone of passage —A continuous water route necessary to allow passage of organisms with no acutely toxic effects produced on their populations.

(II) Other definitions as set forth in the Missouri Clean Water Law and 10 CSR 20-2.010 shall apply to terms used in this rule.

(2) Designation of Uses.

(A) Rebuttable presumption. Consistent with the presumptive beneficial use protections described by 40 CFR Part 131 and section 101(a)(2) of the federal Clean Water Act—

1. All perennial rivers and streams;
2. All streams with permanent pools;
3. All rivers and streams included within the 1:100,000 scale National Hydrography Dataset (NHD) described in subsection (1)(R) of this rule; and
4. All lakes and reservoirs that intersect the flow lines of rivers and streams identified in paragraph (2)(A)3. of this rule,

shall be presumed to support the following designated uses: Aquatic habitat protection; Human health protection; Whole body contact recreation – Category B; and Secondary contact recreation, as defined in this rule. This presumption is rebuttable subject to demonstration based on use attainability analyses as described in subsection (2)(F) of this rule.

(B) Presumed Uses. All waters described in subsection (2)(A) shall also be assigned Livestock and wildlife protection and Irrigation designated uses, as defined in this rule.

(C) Other Uses. Use designations other than those mentioned in subsections (2)(A) and (2)(B) of this rule may be applied to waters identified in subsection (2)(A), Table G and Table H of this rule on a site-specific, case-by-case basis following approval by the Clean Water Commission and U.S. Environmental Protection Agency.

(D) Use Designation. Uses of waters shall be designated as follows:*[—]*

1. Designated uses applied to individual water bodies or stream segments pursuant to subsections (2)(A) through (2)(C) of this rule shall include those identified in Tables G and H and in the Missouri Use Designation Dataset maintained by the department, except as described in paragraph (2)(D)3. of this rule.

2. Designated uses may be assigned on a case-by-case basis to water bodies or stream segments not otherwise represented in Tables G and H or in the Missouri Use Designation Dataset but falling within the jurisdiction of the Missouri Clean Water Law.

3. Assuming reasonable evidence, presumptive beneficial use protections described above shall not apply to water bodies without designated uses pursuant to Tables G or H prior to November 6, 2013 that meet one of the following criteria:

A. Waste treatment systems, or prior converted cropland, which are excluded from the federal definition of "waters of the United States" under 40 CFR 122.2; or

B. Man-made structures which were constructed solely to treat or convey wastewater; or

C. Man-made bodies of water or structures which lack perennial flow and were constructed to treat, convey, or temporarily hold or slow stormwater following precipitation events (this may include certain structures associated with Best Management Practices such as sediment basins, wet and dry detention basins, bioretention basins, rain gardens, bioswales, etc.); or

D. Water bodies that lack jurisdiction under either the federal Clean Water Act or Missouri Clean Water Law.

After receiving such evidence, the department shall make a written determination regarding the applicability of the above-described presumptions, and such determination shall be subject to appeal pursuant to section 621.250, RSMo.

(E) Missouri Use Designation Dataset. The department shall maintain the geospatial dataset described in subsection (1)(P) of this rule. Future revisions to water quality standards in the State of Missouri shall be reflected in the Missouri Use Designation Dataset and shall take effect upon approval by the Clean Water Commission and U.S. Environmental Protection Agency.

(F) Use Attainability. Demonstrations of use attainability for the protection of fish, shellfish and wildlife, recreation in and on the water, or human health protection shall assess the physical, chemical, biological, economic or other factors affecting the attainment of a use pursuant to 40 CFR 131.10(g). Use attainability analyses intended for other designated uses shall be designed and implemented on a case-by-case basis. In accordance with 40 CFR 131.10(j), the following potential actions must be preceded and supported by a use attainability analysis:

1. Designation of a water body for uses that do not include the protection of fish, shellfish and wildlife, recreation in and on the water, and human health protection;

2. Removal of one or more of the uses identified in paragraph 1. of this section; or

3. Application of any use sub-categories for the protection of fish, shellfish and wildlife, recreation in and on the water, or human health protection which require less stringent criteria.

After receiving such demonstration, the department shall make a written determination regarding the use attainability analysis, and such determination shall be subject to appeal pursuant to section 621.250, RSMo.

(3) Antidegradation. The antidegradation policy shall provide three (3) levels of protection.

(A) Tier One. Public health, existing in-stream water uses, and a level of water quality necessary to protect existing uses shall be maintained and protected.

(B) Tier Two. For all waters of the state, if existing water quality is better than applicable water quality criteria established in these rules, that existing quality shall be fully maintained and protected. Water quality may be lowered only if the state finds, after full satisfaction of the intergovernmental coordination and public participation requirements, that the lowered water quality is necessary to allow important economic and social development in the geographical area in which the waters are located. In allowing the lowering of water quality, the state shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control before allowing any lowering of water quality. This provision allows a proposed new or modified point or nonpoint source of pollution to result in limited lowering of water quality provided that—

1. The source does not violate any of the general criteria set forth in section (**4***[3]*) of this rule, or any of the criteria for protection of beneficial uses set forth in section (**5***[4]*) of this rule;

2. The source meets all applicable technological effluent limitations and minimum standards of design for point sources or minimum pollution control practices for nonpoint sources; and

3. The lowering of water quality, in the judgment of the department, is necessary for the accommodation of important economic and social development in the geographical vicinity of the discharge. In making a preliminary determination based on socioeconomic development considerations, the department may consider the potential for regional increases in utility rates, taxation levels, or recoverable costs associated with the production of goods or services that may result from the imposition of a strict no-degradation policy. Consideration may also be given to the possible indirect effects of a policy on per capita income and the level of employment in the geographical vicinity of the proposed pollution source. Any preliminary decision by the department to allow a limited lowering of water quality will be stated as such in a public notice issued pursuant to 10 CSR 20-6.010. Pursuant to that provision, a public hearing will be held in the geographical vicinity of the proposed pollution source, if the department determines there is significant public interest in and need for a hearing.

(C) Tier Three. There shall be no lowered water quality in outstanding national resource waters or outstanding state resource waters, as designated in Tables D and E.

(D) The three (3) levels of protection provided by the antidegradation policy in subsections (A) through (C) of this section shall be implemented according to procedures hereby incorporated by reference and known as the "Missouri Antidegradation Rule and Implementation Procedure, *[May 2, 2012]***July 13 , 2016** ." No later amendments or additions are included. This document shall be made available to anyone upon written request to the Department of Natural Resources, Water Protection Program, Water Pollution Control Branch, PO Box 176, Jefferson City, MO 65102-0176.

(4) General Criteria. The following water quality criteria shall be applicable to all waters of the state at all times including mixing zones. No water contaminant, by itself or in combination with other substances, shall prevent the waters of the state from meeting the following conditions:

(A) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly, or harmful bottom deposits or prevent full maintenance of beneficial uses;

(B) Waters shall be free from oil, scum, and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses;

(C) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor, or prevent full maintenance of beneficial uses;

(D) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal, or aquatic life**. However, acute toxicity may be allowed by permit in zones of initial dilution, and chronic toxicity may be allowed by permit in mixing zones**;

(E) Waters shall be free from nutrients in sufficient amounts to cause harmful algal blooms, high turbidity, offensive odor, reduced aquatic biodiversity, or prevent full maintenance of beneficial uses;

(F) Waters shall maintain a level of water quality at their confluences to downstream waters that provides for the attainment and maintenance of the water quality standards of those downstream waters, including waters of another state.

(*[E]***G**) There shall be no significant human health hazard from incidental contact with the water;

(*[F]***H**) There shall be no acute toxicity to livestock or wildlife watering;

(*[G]***I**) Waters shall be free from physical, chemical, or hydrologic changes that would impair the natural biological community;

(*[H]***J**) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment, and solid waste as defined in Missouri's Solid Waste Law, section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to sections 260.200–260.247, RSMo;

(*[I]***K**) Waters in mixing zones, ephemeral aquatic habitat and waters of the state lacking designated uses shall be subject to the following requirements:

1. The acute toxicity criteria of Tables A and B and the requirements of subsection (5)(B); and
2. The following whole effluent toxicity conditions must be satisfied:

A. Single dilution method. The percent effluent at the edge of the zone of initial dilution will be computed and toxicity tests performed at this percent effluent. These tests must show statistically-insignificant mortality on the most sensitive of at least two (2) representative, diverse species; and

B. Multiple dilution method. An LC_{50} will be derived from a series of test dilutions. The computed percent effluent at the edge of the zone of initial dilution must be less than three-tenths (0.3) of the LC_{50} for the most sensitive of at least two (2) representative, diverse species.

(5) Specific Criteria. The specific criteria shall apply to waters contained in Tables G and H of this rule and the Missouri Use Designation Dataset. Protection of drinking water supply is limited to surface waters designated for raw drinking water supply and aquifers. Protection of whole body contact recreation is limited to waters designated for that use.

(A) The maximum chronic toxicity criteria in Tables A and B shall apply to waters designated for the indicated uses given in the Missouri Use Designation Dataset and Tables G and H *[, except for waters designated for Ephemeral Aquatic Habitat or where less stringent criteria have been developed following a use attainability analysis]*. All Table A and B criteria are chronic toxicity criteria, except those specifically identified as acute criteria. Water contaminants shall not cause or contribute to concentrations in excess of these values. Table A values listed as health advisory levels shall be used in establishing discharge permit limits and management strategies until additional data becomes available to support alternative criteria, or other standards are established. However, exceptions may be granted in the following cases:

1. Permanent flow streams when the stream flow is less than 7Q10;
2. Regulated flow streams if the flow is less than the minimum release flow agreed upon by the regulating agencies;
3. For the natural and unavoidable chemical and physical changes that occur in the hypolimnion of lakes. Streams below impoundments shall meet applicable specific criteria;
4. For mixing zones.

A. The mixing zone shall be exempted from the chronic criteria requirements of this section for those components of waste that are rendered non toxic by dilution, dissipation, or rapid chemical transformation. Acute numeric criteria of Tables A and B and whole effluent acute toxicity requirements of subsection (4)(I) must be met at all times within the mixing zone, ex cept within the zone of initial dilution. The following criteria do not apply to thermal mixing zones. Criteria for thermal mixing zones are listed in paragraph (5)(D)6.

B. The maximum size of mixing zones and zone **s** of initial dilution will be determined as follows **(the size may be refined by the use of mixing zone models, e.g. CORMIX, as appropriate):**

(I) Streams with 7Q10 low flows of less than one-tenth cubic foot per second (0.1 cfs)**—***[;]*

(a) Mixing zone—not allowed; and

(b) Zone of initial dilution—not allowed**.** *[;]*

(II) Streams with 7Q10 low flow of one-tenth to twenty cubic feet per second (0.1–20 cfs)—

(a) Mixing zone—one-quarter (1/4) of the stream width, cross-sectional area, or volume of flow; length one-quarter (1/4) mile. If the discharger can document that rapid and complete mixing of the effluent occurs in the receiving stream, the mixing zone may be up to one-half (1/2) of the stream width, cross-sectional area, or volume of flow; and

(b) Zone of initial dilution—one-tenth (0.1) of the mixing zone width, cross-sectional area, or volume of flow**.***[;]*

(III) Streams with 7Q10 low flow of greater than twenty cubic feet per second (20 cfs)—

(a) Mixing zone—one-quarter (1/4) of stream width, cross-sectional area, or volume of flow; length of one-quarter (1/4) mile**. If the discharger can document that rapid and complete mixing of the effluent occurs in the receiving stream, the mixing zone may be up to one-half (1/2) of the stream width, cross-sectional area, or volume of flow**; and

(b) Zone of initial dilution—one-tenth (0.1) of the mixing zone width, cross-sectional area, or volume of flow and no more than ten (10) times the effluent design flow volume unless the use of diffusers or specific mixing zone studies can justify more dilution**.***[; and]*

(IV) Lakes*[.]***—**

(a) Mixing zone—not to exceed one-quarter (1/4) of the lake width at the discharge point or one hundred feet (100') from the discharge point, whichever is less**; and***[.]*

(b) Zone of initial dilution—not allowed.

C. A mixing zone shall not overlap another mixing zone in a manner that the maintenance of aquatic life in the body of water in the overlapping area would be further adversely affected.

D. Other factors that may prohibit or further limit the size and location of mixing zones are the size of the river, the volume of discharge, the stream bank configuration, the mixing velocities, other hydrologic or physiographic characteristics, and the designated uses of the water, including type of aquatic life supported, potential effects on mouths of tributary streams, and proximity to water supply intakes.

E. Zones of passage must be provided wherever mixing zones are allowed. **Mixing zones and zones of initial dilution shall be designed to avoid negative impacts to species known to be sensitive to the toxic pollutant(s) being discharged.**

F. Mixing zone and zone of initial dilution size limits will normally be based on streams at the 7Q10 low flow. However, this percent of stream size limits also applies at higher stream flows and discharge limitations may be based on higher strea m flows if discharge volume or quality may be adjusted to correlate with stream flow; and

5. For wetlands. Water quality needs will vary depending on the individual characteristics of the wetland. Application of numeric criteria will depend on the specific aquatic life, wildlife, and vegetation requirements.

A. Specific criteria for wetlands shall be developed using scientific procedures including, but not limited to, those procedures described in the U.S. Environmental Protection Agency's *Water Quality Standards Hand book*, Second Edition, August 1994 as published by the Office of Science and Technology, Office of Water, U.S. Environmental Protection Agency, Washington, DC 20460, which are hereby incorporated by reference and do not include any later amendments or addit ions. The department shall maintain a copy of the referenced documents and shall make them available to the public for inspection and copying at no more than the actual cost of reproduction.

B. Specific criteria shall protect all life stages of species ass ociated with wetlands and prevent acute and chronic toxicity in all parts of the wetland.

C. Specific criteria shall include both chronic and acute concentrations to better reflect the different tolerances to the inherent variability between concentrations and toxicological characteristics of a condition.

D. Specific criteria shall be clearly identified as maximum "not to be exceeded" or average values, and if an average, the averaging period and the minimum number of samples. The conditions, if any, when t he criteria apply shall be clearly stated (e.g., specific levels of hardness, pH, or water temperature). Specific sampling requirements (e.g., location, frequency), if any, shall also be identified.

E. The data, testing procedures, and application (safety) factors used to develop specific criteria shall reflect the nature of the condition (e.g., persistency, bioaccumulation potential) and the most sensitive species associated with the wetland.

F. Each specific criterion shall be promulgated in rule 10 CSR 2 0-7.031. The public notice shall include a description of the affected wetland and the reasons for applying the proposed criterion. A public hearing may be held in the geographical vicinity of the affected wetland. Any specific criterion promulgated under these provisions is subject to U.S. Environmental Protection Agency approval prior to becoming effective.

(B) Toxic Substances.

1. Water contaminants shall not cause the criteria in Tables A and B to be exceeded. Concentrations of these substances in bottom sediments or waters shall not harm benthic organisms and shall not accumulate through the food chain in harmful concentrations, nor shall state and federal maximum fish tissue levels for fish consumption be exceeded. More stringent criteria may be imposed if there is evidence of additive or synergistic effects.

2. For compliance with this rule, metals shall be analyzed by the following methods:

A. Aquatic life protection and human-health protection—fish consumption;*[.]*

(I) Mercury—total recoverable metals;*[.]*

(II) All other metals—dissolved metals.*[;]*

B. Drinking water supply—total recoverable metals; and

C. All other beneficial uses—total recoverable metals.

3. Other potentially toxic substances for which sufficient toxicity data are not available may not be released to waters of the state until safe levels are demonstrated through adequate bioassay studies.

4. Drinking water criteria, for substances which are rendered nontoxic by transformation processes in the surface water body, shall apply at water supply withdrawal points.

5. Site-specific alternative criteria for human health-fish consumption may be allowed. Designation of these site-specific criteria must follow procedures set forth in U.S. Environmental Protection Agency's *Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health, October 2000* (EPA-822-B-00-004), as published by the Office of Science and Technology, Office of Water, U.S. Environmental Protection Agency, Washington, DC 20460, which is hereby incorporated by reference and does not include any later amendments or additions. The department shall maintain a copy of the referenced document and shall make it available to the public for inspection and copying at no more than the actual cost of reproduction.

6. Metals criteria for which toxicity is hardness dependent are in equation format in Table A.

7. Total ammonia nitrogen. For any given sample, the total ammonia nitrogen criteria shall be based on the pH and temperature of the water body measured at the time of each sample at the point of compliance.

A. The acute criteria shall not be exceeded at any time except in those waters for which the department has allowed a zone of initial dilution (ZID). The one- (1-) day Q_{10} low flow condition will be used in determining acute total ammonia nitrogen criteria.

B. The chronic criteria shall not be exceeded except in water segments for which the department has allowed a mixing zone (MZ). The chronic criteria shall be based on a thirty- (30-) day exposure period. Therefore, the thirty- (30-) day Q_{10} low flow condition of the receiving water body will be used in determining chronic total ammonia nitrogen criteria.

C. Without sufficient and reliable data, it is assumed that early life stages are present and must be protected at all times of the year.

(I) Sufficient and reliable data shall include, but are not limited to, seasonal studies on the fish species distributions, spawning periods, nursery periods, duration of sensitive life stages, and water body temperature. Best professional judgment from fisheries biologists and other scientists will be considered as appropriate.

(II) The time frames during the year when early life stages are considered to be absent are those time periods when early life stages are present in numbers that, if chronic toxicity did occur, would not affect the long-term success of the populations.

(III) A source of information for determining the duration of early life stages is *The American Society for Testing and Materials (ASTM) Standard E-1241*, "Standard Guide for Conducting Early Life-Stage Toxicity Tests with Fishes."

(IV) Protection of early life stages should include the most sensitive species that have used a water body for spawning and rearing since November 28, 1975.

(C) Bacteria. The protection of whole body contact recreation is limited to waters designated for that use. The recreational season is from April 1 to October 31. The *E. coli* count shall not exceed the criterion listed in Table A as a geometric mean during the recreational season in waters designated for whole body contact recreation. The *E. coli* count shall not exceed one hundred twenty-six (126) per one hundred milliliters (100 mL) at any time in losing streams. For waters designated for secondary contact recreation, the *E. coli* count shall not exceed one thousand one hundred thirty-four (1,134) per one hundred milliliters (100 mL) as a geometric mean during the recreational season.

(D) Temperature.

1. For warm water habitats beyond the mixing zone, water contaminant sources and physical alteration of the water course shall not raise or lower the temperature of a stream more than five degrees Fahrenheit (5 °F) or two and seven-ninths degrees Celsius (2 7/9 °C). Water contaminant sources shall not cause or contribute to stream temperature in excess of ninety degrees Fahrenheit (90 °F) or thirty-two and two-ninths degrees Celsius (32 2/9 °C). However, site-specific ambient temperature data and requirements of sensitive resident aquatic species will be considered, when data are available, to establish alternative maxima or deviations from ambient temperatures.

2. For cool water habitats beyond the mixing zone, water contaminant sources and physical alteration of the water course shall not raise or lower the temperature of a stream more than five degrees Fahrenheit (5 °F) or two and seven-ninths degrees Celsius (2 7/9 °C). Water contaminant sources shall not cause or contribute to stream temperature in excess of eighty-four degrees Fahrenheit (84 °F) or twenty-eight and eight-ninths degrees Celsius (28 8/9 °C).

3. For cold water habitats beyond the mixing zone, water contaminant sources and physical alteration of the water course shall not raise or lower the temperature of the water body more than two degrees Fahrenheit (2 °F) or one and one-ninth degrees Celsius (1 1/9 °C). Water contaminant sources shall not cause or contribute to temperatures above sixty-eight degrees Fahrenheit (68 °F) or twenty degrees Celsius (20 °C).

4. Water contaminant sources shall not cause any measurabl e rise in the temperature of lakes. An increase is allowable for Lake Springfield, Thomas Hill Reservoir, and Montrose Lake; however, discharges from these lakes must comply with temperature limits for streams.

5. For the Mississippi River Zones 1A and 2, the water temperature outside the mixing zone shall not exceed the maximum limits indicated in the following list during more than one percent (1%) of the time in any -calendar year. In Zone 1B, limit s may not be exceeded more than five percent (5%) of th e time in a calendar year. At no time shall the river water temperature outside of the thermal mixing zone exceed the listed limits by more than three degrees Fahrenheit (3 °F) or one and six -ninths degrees Celsius (1 6/9 °C).

	A and B		**C**	
	(°F)	(°C)	(°F)	(°C)
January	45	7 2/9	50	10
February	45	7 2/9	50	10
March	57	13 8/9	60	15 5/9
April	68	20	70	21 1/9
May	78	25 5/9	80	26 6/9
June	86	30	87	30 5/9
July	88	31 1/9	89	31 6/9
August	88	31 1/9	89	31 6/9
September	86	30	87	30 5/9
October	75	23 8/9	78	25 5/9
November	65	18 3/9	70	21 1/9
December	52	11 1/9	57	13 8/9

A = Zone 1A—Des Moines River to Lock and Dam No. 25.
B = Zone 1B—Lock and Dam No. 25 to Lock and Dam No. 26.
C = Zone 2—Lock and Dam No. 26 to the Missouri-Arkansas state line.

6. Thermal mixing zones shall be limited to twenty -five percent (25%) of the cross -sectional area or volume of a river, unless biological surveys performed in response to section 316(a) of the federal Clean Water Act (or equivalent) indicate no significant adverse impact on aquatic life. Thermal plume lengths and widths within rivers, and all plume dimensions within lakes, shall be determined on a case-by-case basis and shall be based on physical and biological surveys when appropriate.

(E) pH. Water conta minants shall not cause **the four-day average pH concentration of representative samples** *[pH]* to be outside of the range of 6.5 to 9.0 standard pH units **(chronic toxicity)**.

(F) Taste- and Odor-Producing Substances. Taste - and odor -producing substances shall be limited to concentrations in the streams or lakes that will not interfere with beneficial uses of the water. For those streams and lakes designated for drinking water supply use, the taste- and odor-producing substances shall be limited to concentration s that will not interfere with the production of potable water by reasonable water treatment processes.

(G) Turbidity and Color. Water contaminants shall not cause or contribute to turbidity or color that will cause substantial visible contrast with the natural appearance of the stream or lake or interfere with beneficial uses.

(H) Solids. Water contaminants shall not cause or contribute to solids in excess of a level that will interfere with benefici al uses. The stream or lake bottom shall be free of mat erials which will adversely alter the composition of the benthos, interfere with the spawning of fish or development of their eggs, or adversely change the physical or chemical nature of the bottom.

(I) Radioactive Materials. All streams and lakes shall c onform to state and federal limits for radionuclides established for drinking water supply.

(J) Dissolved Oxygen. Water contaminants shall not cause the dissolved oxygen to be lower than the levels described in Table A*[or Table K—Site-Specific Criteria]*.

(K) Total Dissolved Gases. Operation of impoundments shall not cause the total dissolved gas concentrations to exceed one hundred ten percent (110%) of the saturation value for gases at the existing atmospheric and hydrostatic pressures.

(L) Sulfate and Chloride Limit for Protection of Aquatic Life. Water contaminants shall not cause sulfate or chloride criteria to exceed the levels described in Table A.

(M) Carcinogenic Substances. Carcinogenic substances shall not exceed concentrations in water which c orrespond to the 10^{-6} cancer risk rate. This risk rate equates to one (1) additional cancer case in a population of one (1) million with lifetime e xposure. Derivation of this concentration assumes average water and fish consumption amounts. Assumptions are two **and four-tenths** (2.**4**) liters of water and *[six and one-half (6.5)]* **twenty-two (22.0)** grams of fish consumed per day. Federally established final maximum contaminant levels for drinking water supply shall supersede drinking water supply criteria developed in this manner.

(N) Nutrients and Chlorophyll.

1. Definitions.

A. For the purposes of this rule, *[—*

*(I) A]***a**ll lakes and reservoirs shall be referred to as "lakes"*.[; and*

(II) Only total phosphorus (TP) criteria are derived from lake characteristics. Total nitrogen (TN) and chlorophyll (Chl) criteria are determined as a function of TP criteria.]

B. Lake ecoregions —Due to differences in **watershed** topography, soils, and geology, nutrient criteria for lakes and reservoirs will be determined by the use of four (4) major ecoregions **based upon dominant watershed ecoregion.** These regions were delineated by grouping the ecological subsections described in Nigh and Schroeder, 2002, *Atlas of Missouri Ecoregions*, *[Missouri Department of Conservation]* as follows:

(I) Plains: **OP1 – Scarped Osage Plains: OP2 – Cherokee Plains;** TP2—Deep Loess Hills; TP3—Loess Hills; TP4—Grand River Hills; TP5—Chariton River Hills; TP6—Claypan Till Plains; TP7—Wyaconda River Dissected Till Plains; TP8—Mississippi River Hills;

(II) Ozark Border: MB2a—Crowley's Ridge Loess Woodland/Forest Hills; OZ11—Prairie Ozark Border; OZ12—Outer Ozark Border; OZ13—Inner Ozark Border;

(III) Ozark Highland: OZ1—Springfield Plain; OZ2—Springfield Plateau; OZ3—Elk River Hills; OZ4—White River Hills; OZ5—Central Plateau; OZ6—Osage River Hills; OZ7—Gasconade River Hills; OZ8—Meramec River Hills; OZ9—Current River Hills; OZ10—St. Francois Knobs and Basins; OZ14—Black River Ozark Border; and

(IV) Big River Floodplain: MB1—Black River Alluvial Plain; MB2b—Crowley's Ridge Footslopes and Alluvial Plains; MB3—St. Francis River Alluvial Plain; MB4, OZ16, TP9—Mississippi River Alluvial Plain; OZ15, TP1—Missouri River Alluvial Plain.

C. Nutrient Criteria**—The following nutrient criteria represent the desired condition f or a water body necessary to protect the designated uses assigned in rule:**

[(I) Prediction value—A TP concentration that is derived from the characteristics of a lake including dam height in feet, hydraulic residence time in years, and percentage of the watershed that was historically covered by prairie grasses. Prediction values for total phosphorus are calculated directly from these characteristics.

(II) Reference value—A TP concentration that is representative of lakes within an ecoregion having the following characteristics:

(a) Less than twenty percent (20%) of the watershed is in crop land and urban land combined;

(b) There are no point source wastewater discharges and no concentrated animal feeding operations within the watershed;

(c) In the Plains region, more than fifty percent (50%) of the watershed is in grass land; and

(d) In the Ozark Highlands region, more than fifty percent (50%) of the watershed is in woodland.]

(I) Lake Ecoregion Criteria—Maximum Ambient Concentration of Chlorophyll-a (Chl-a) that is based on the geometric mean of a minimum of three (3) years of data for lakes within a lake ecoregion that have not been assigned site-specific criteria; and

[(III) Site-specific value—A TP concentration for a lake that has been identified as having trophic characteristics for which the reference of the ecoregion and the prediction values for that water body are not adequate to prevent deterioration of water quality. Site-specific criteria are applicable to lakes having a geometric mean TP concentration equal to or less than the 10th percentile value of the range of geometric mean TP concentrations measured in reference lakes within a lake ecoregion. Site-specific criteria are also applicable to lakes with actual TP geometric mean concentrations that are at or below the reference value where the prediction value is at or below the 10th percentile for TP geometric mean concentrations within a lake ecoregion. The 10th percentile values for each ecoregion are listed in Table L and lakes with site-specific criteria are listed in Tables M and N.]

(II) Lake Site-Specific Criteria—Maximum Ambient Concentrations of total phosphorus (TP), total nitrogen (TN), or Chl-a that are based on the geometric mean of a minimum of three (3) years of data and the unique characteristics of the waterbody.

D. Nutrient Screening Values—The following nutrient screening values represent nutrient concentrations that, over time, set the potential to threaten the designated uses assigned in rule:

(I) Long-Term Screening Value—Maximum Ambient Concentrations of TP, TN, and Chl-a that are based on the geometric mean of a minimum of three (3) years of nutrient data; and

(II) Short-Term Screening Value—Maximum Ambient Concentrations of TP, TN, and Chl-a that are based on the geometric mean of one (1) year of nutrient data.

E. Tributary arm—A substantial segment of a*[n]* **Class** L2 lake that is primarily recharged by a source or sources other than the main channel of the lake.

2. This rule applies to all lakes *[and reservoirs]* that are waters of the state and *[that are outside the Big River Floodplain ecoregion and]* have an area of at least ten (10) acres during normal pool **condition**. **Big River Floodplain lakes shall not be subject to these criteria.**

3. **Lake Ecoregion Criteria and Long -Term and Short -Term Screening Values for TP, TN, and Chl -a are listed in Table L. Lake Site -Specific Criteria for TP, TN, and Chl -a are listed in Table M. Additional lake site -specific criteria may be developed in accordance with subsection (5)(S) to accoun t for the unique characteristics of the waterbody that affect trophic status, such as lake morphology, hydraulic residence time, temperature, internal nutrient cycling, or watershed contribution from multiple ecoregions. TP criteria for tributary arms of Class L2 lakes are listed in Table N .** *[Nutrient criteria for lakes and reservoirs with site-specific criteria are listed in Tables M and N. Nutrient criteria for other lakes are as follows:*

A. Total phosphorus (TP)—

(I) For lakes in which the TP prediction value or the actual TP concentration does not exceed the reference value listed in Table L, the TP criterion shall be the reference value, except as described below;

(II) For lakes in which the TP prediction value does not exceed the reference value, and the actual TP value does not exceed the prediction value, the TP criterion shall be the prediction value;

(III) For lakes in which the TP prediction value and the actual TP concentration exceed the reference value listed in Table L, the TP criterion shall be limited to the prediction value; and
(IV) Site-specific TP criteria for the tributary arms of L2 lakes are listed in Table N;
B. Total nitrogen (TN)—
(I) For lakes in which the TP prediction value does not exceed the reference value listed in Table L, TN concentration shall be limited to twenty (20) times the TP reference value;
(II) For lakes in which the TP prediction value does not exceed the reference value, and the actual TP value does not exceed the prediction value, TN concentration shall be limited to twenty (20) times the TP prediction value;
(III) For lakes in which the TP prediction value exceeds the TP reference value listed in Table L, TN concentration shall be limited to twenty (20) times the TP prediction value; and
(IV) This portion of the rule does not apply to lakes that are held to site-specific criteria for TP, TN, and Chl, as listed in Tables M and N; and
C. Chlorophyll (Chl)—Chl criteria shall be calculated from TP criteria as follows:
(I) Plains: Chl:TP = 0.44;
(II) Ozark Border and Ozark Highlands: Chl:TP = 0.42; and
(III) This portion of the rule does not apply to lakes that are held to site-specific criteria for TP, TN, and Chl, as listed in Tables M and N.]

4. All TP, TN, and **Chl-a** concentrations must be calculated as the geometric mean of a minimum of four (4) representative samples per year for **three (3) years for purposes of comparison to criteria and long-term screening values.** ***[four (4) years that are not necessarily consecutive]*. All TP, TN, and Chl-a concentrations must be calculated as the geometric mean of a minimum of four (4) representative samples per year for one (1) year for purposes of comparison to short-term screening values.** All samples must be collected from the **lake** surface, near the outflow end of the lake, and during the period May 1 – **September 30***[August 31]*.

5. Lakes with water quality that exceed Nutrient Criteria identified in Tables L and M are to be deemed impaired for excess nutrients.

6. Lakes with water quality that exceed long-term or short-term screening values for Chl-a, TN, or TP will be assessed for impairment using a weight of evidence evaluation.

A. Weight of evidence factors for aquatic life uses include:

(I) Occurrence of eutrophication related fish mortality or morbidity events;

(II) Epilimnetic excursions from dissolved oxygen or pH criteria; and

(III) Excessive levels of mineral turbidity that consistently limit algal productivity during the period May 1 – September 30.

B. Weight of evidence factors for drinking water supply uses include:

(I) Impacts on water treatment operations due to eutrophication including excessive disinfection byproduct formation or unacceptable aesthetics; and

(II) Reoccurring algal toxins in excess of one (1) microgram per liter microcystins.

7. Lakes with water quality that exceed long-term or short-term Screening values for Chl-a, TN, or TP for which the weight of evidence as described in paragraph 6 of this rule does not clearly indicate impairment or lack of impairment will receive continued observation and monitoring until such time as a determination can be made concerning their impairment status.

(O) All methods of sample collection, preservation, and analysis used in applying criteria in these standards shall be in accord with those prescribed in the latest edition of *Standard Methods for the Examination of Water and Wastewater* or other procedures approved by the Environmental Protection Agency and the Missouri Department of Natural Resources.

(P) Criteria to protect designated uses are based on current technical literature, especially the Environmental Protection Agency's publication, *Quality Criteria for Water*, 1986. Criteria may be modified or expanded as additional information is developed or as needed to define narrative criteria for particular situations or locations.

(Q) WET Chronic Tests. Chronic WET tests performed at the percent effluent at the edge of the mixing zone shall not be toxic to the more sensitive of at least two (2) representative, diverse species. Pollutant attenuation processes such as volatilization and biodegradation which may occur within the allowable mixing zone will be considered in interpreting results.

(R) Biocriteria. The biological integrity of waters, as measured by lists or numeric indices of benthic invertebrates, fish, algae, or other appropriate biological indicators, shall not be significantly different from reference waters. Waters targeted for numeric biological criteria assessment must be contained within the Missouri Use Designation Dataset and shall be compared to reference waters of similar size, scale within the stream network, habitat type, and aquatic ecoregion type. Reference water locations for some aquatic habitat types are listed in Table I.

(S) Site-Specific Criteria Development for the Protection and Propagation of Fish, Shellfish, and Wildlife. When water quality criteria in this regulation are either underprotective or overprotective of water quality due to factors influencing bioavailability, or non-anthropogenic conditions for a given water body segment, a petitioner may request site-specific criteria. The petitioner must provide the department with sufficient documentation to show that the current criteria are not adequate and that the proposed site-specific criteria will protect all existing and/or potential uses of the water body.

1. Site-specific criteria may be appropriate where, but is not limited to the examples given in subparagraphs A. or B. of this paragraph.

A. The resident aquatic species of the selected water body have a different degree of sensitivity to a specific pollutant as compared to those species in the data set used to calculate the national or state criteria as described in either of the following parts:

(I) Natural adaptive processes have enabled a viable, balanced aquatic community to exist in waters where natural (non-anthropogenic) background conditions exceed the criterion (e.g., resident species have evolved a genetically-based greater tolerance to high concentrations of a chemical); or

(II) The composition of aquatic species in a water body is different from those used in deriving a criterion (e.g., most of the species considered among the most sensitive, such as salmonids or the cladoceran, *Ceriodaphinia dubia*, which were used in developing a criterion, are absent from a water body).

B. The physical and/or chemical characteristics of the water body alter the biological availability and/or toxicity of the pollutant (e.g., pH, alkalinity, salinity, water temperature, hardness). Such an example is the Water Effect Ratio (WER) defined at (1)(AA) of this rule.

2. All petitioners seeking to develop site-specific criteria shall coordinate with the department early in the process. This coordination will ensure the use of adequate, relevant, and quality data; proper analysis and testing; and defendable procedures.

A. The department will provide guidance for establishing site-specific water quality criteria using scientific procedures including, but not limited to, those procedures described in:

(I) U.S. Environmental Protection Agency's *Water Quality Standards Handbook,* Second Edition, August 1994;

(II) U.S. Environmental Protection Agency's *Interim Guidance on Determination and Use of Water-Effect Ratios for Metals* (EPA-823-B-94-001) and subsequent 1997 modifications;

(III) U.S. Environmental Protection Agency's *Streamlined Water-Effect Ratio Procedure for Discharges of Copper* (EPA-822-R-01-005); and

(IV) U.S. Environmental Protection Agency's *Aquatic Life Ambient Freshwater Quality Criteria – Copper 2007 Revision* (EPA-822-R-07-001).

B. Site-specific criteria development for the Protection and Propagation of Fish, Shellfish and Wildlife shall be performed using the guidance documents listed in parts (5)(S)2.A.(I)–(IV) as published by the Office of Science and Technology, Office of Water, U.S. Environmental Protection Agency, Washington, DC 20460, which are hereby incorporated by reference and do not include any later amendments or additions. The department shall maintain a copy of the referenced documents and shall make them available to the public for inspection and copying at no more than the actual cost of reproduction.

3. Site-specific criteria shall protect all life stages of resident species and prevent acute and chronic toxicity in all parts of a water body*[unless early life stages are determined absent]*.

4. Site-specific criteria shall include both chronic and acute concentrations to better reflect the different tolerances of resident species to the inherent variability between concentrations and toxicological characteristics of a chemical.

5. Site-specific criteria shall be clearly identified as maximum "not to be exceeded" or average values, and if an average, the averaging period and the minimum number of samples. The conditions, if any, when the criteria apply shall be clearly stated (e.g., specific levels of hardness, pH, or water temperature). Specific sampling requirements (e.g., location, frequency), if any, shall also be identified.

6. The data, testing procedures, and application (safety) factors used to develop site-specific criteria shall reflect the nature of the chemical (e.g., persistency, bioaccumulation potential, and avoidance or attraction responses in fish) and the most sensitive resident species of a water body.

7. The size of a site may be limited to a single water segment, single water subsegment, or may cover a whole watershed depending on the particular situation for which the specific criterion is developed. A group of water bodies may be considered one (1) site if their respective aquatic communities are similar in composition and have comparable water quality.

8. The department shall determine if a site-specific criterion is adequate and justifiable. *[Each site-specific criterion shall be promulgated into rule 10 CSR 20-7.031.]* The public notice shall include a description of the affected water body or water body segment and the reasons for applying the proposed criterion. If the department determines that there is significant public interest, a public hearing may be held in the geographical vicinity of the affected water body or water body segment. Any site-specific criterion promulgated under these provisions is subject to U.S. Environmental Protection Agency approval prior to becoming effective **for Clean Water Act purposes**.

(6) Groundwater.

(A) Water contaminants shall not cause or contribute to exceedence of Table A, groundwater limits in aquifers and caves. Table A values listed as health advisory levels shall be used in establishing management strategies and groundwater cleanup criteria, until additional data becomes available to support alternative criteria or other standards are established. Substances not listed in Table A shall be limited so that drinking water, livestock watering, and irrigation uses are protected.

(B) When criteria for the protection of aquatic life or human health protection-fish consumption in Table A are more stringent than groundwater criteria, appropriate criteria for the protection of aquatic life or human health protection-fish consumption shall apply to waters in caves and to aquifers which contribute an important part of base flow of surface waters designated for aquatic life protection. Other substances not listed in Table A shall be limited in these aquifers and caves so that the aquatic life use is protected.

(C) Groundwater and other criteria shall apply in any part of the aquifer, including the point at which the pollutant enters the aquifer. A specific monitoring depth requirement for releases to aquifers is included in 10 CSR 20-7.015(7)(A).

(D) For aquifers in which contaminant concentrations exceed groundwater criteria or other protection criteria, and existing and potential uses are not impaired, alternative site -specific criteria may be allowed. To allow alternative criteria, the management authority must demonstrate that alter native criteria will not impair existing and potential uses. The demonstration must consider the factors and be subject to the review requirements of 10 CSR 20-7.015(7)(F).

(7) Metropolitan No -Discharge Streams. No water contaminant except uncontaminated cooling water, permitted stormwater discharges in compliance with permit conditions and excess wet -weather bypass discharges not interfering with beneficial uses, shall be discharged to the watersheds of streams listed in Table F. Existing interim discharg es may be allowed until interceptors are available within two thousand feet (2,000') or a distance deemed feasible by the department, or unless construction of ou tfalls to alternative receiving waters not listed in Table F is deemed feasible by the departm ent. Existing discharges include wastewater volumes up to the design capacity of existing permitted treatment facilities, including phased increases in design capacity approved by the department prior to the effective date of this rule. Additional faciliti es may be constructed to discharge to these waters only if they are intended to be interim facilities in accordance with a regional wastewater treatment plan approved by the department.

(8) Outstanding National Resource Waters. Under section (3), antidegra dation section of this rule, new releases to outstanding national resource waters from any source are prohibited and releases from allowed facilities are subject to special effluent limitations as required in 10 CSR 20-7.015(6). Table D contains a list of the outstanding national resource waters in Missouri.

(9) Outstanding State Resources Waters. The commission wishes to recognize certain high -quality waters that may require exceptionally stringent water -quality management requirements to assure conformanc e with the antidegradation policy. The degree of management requirements will be decided on an individual basis. To qualify for inclusion, all of the following crit eria must be met. The waters listed in Table E must—

(A) Have a high level of aesthetic or scientific value;

(B) Have an undeveloped watershed; and

(C) Be located on or pass through lands which are state or federally owned, or which are leased or held in perpetual easement for conservation purposes by a state, federal, or private conservation agency or organization.

(10) Lake Taneycomo. The commission wishes to recognize the uniqueness of Lake Taneycomo with respect to its high water clarity, its importance as a trout fishery, and as the central natural resource in the rapidly developing Branson a rea and threats to the lake's water quality imposed by development. An especially stringent antidegradation policy will be observed in the development of effluent rules, discharge permits, and nonpoint -source management plans and permits to assure that the high visual quality and aquatic resources are maintained. The use of the best treatment technology for point - and nonpoint-source discharges in the lake's watershed between Table Rock Lake and Power Site Dam will be the guiding principle in establishing limitations.

(11) Compliance with Water Quality Based Limitations. Compliance with new or revised National Pollutant Discharge Elimination System (NPDES) or Missouri operating permit limitations based on criteria in this rule shall be achieved in accordance with federal regulation at 40 CFR Part 122.47, "Schedules of Compliance," May 15, 2000, as published by the Office of the Federal Register, National Archives and Records Administration, Superintendent of Documents, Pittsburgh, PA 15250 - 7954, which is here by incorporated by reference and does not include any later amendments or additions. The department shall maintain a copy of the referenced document and shall make it available to the public for inspection and copying at no more th an the actual cost of reproduction.

(12) **Water Quality Standards** Variances. *[(A)]* A permittee or an applicant for a National Pollutant Discharge Elimination System (NPDES) or Missouri state operating permit *[,]* may pursue a temporary variance *[to a water quality standard]* pursuant to either section 644.061 or section 644.062, RSMo. In order to obtain U.S. Environmental Protection Agency approval for a water quality standards variance for purposes of the federal Clean Water Act **under 40 CFR 131.14** , the following additional provisions apply:

(A)*[1.]* A variance applies only to the applicant identified in such variance and only to the water quality standard specified in the variance. A variance does not **permanently** modify an underlying water quality standard*[.]***;**

(B)*[2.]* A variance shall not be granted if water quality standards will be attained by implementing technology -based effluent limits required under 10 CSR 20-7.015 of this rule and by implementing cost-effective and reasonable best management practices for non-point source control*[.]***;**

[3. A variance shall not be granted for actions that will violate general criteria conditions prescribed by 10 CSR 20 - 7.031(4).]

(C)*[4.]* A variance shall not be granted that would likely jeopardize the continued existence of any endangered or threate ned species or result in the destruction or adverse modification of such species' critical habitat*[.]***;**

(D)*[5.]* A variance may be granted if the applicant demonstrates that achieving the water quality standard is not feasible as supported by an analysis based on the factors provided in 40 CFR 131.10(g)*[, or other appropriate factors.]***;**

(E)*[6.]* In granting a variance, conditions and time limitations shall be set by the department with the intent that progress be made toward attaining water quality standards*[.]***;**

(F)*[7.]* Each variance shall be granted only after public notification and opportunity for public comment. Once any variance to water quality standards is granted, the department shall submit the variance, with an Attorney General Certification that the Clean Water Commission adopted the variance in accordance with state law, to the U.S. Environmental Protection Agency for approval*[.]*;

(G) Individual variances using the terms, conditions, and procedures found in the Missouri Multiple -Discharger Variance Framework, adopted by the Clean Water Commission on October 5, 2016, will be effective upon approval by the Clean Water Commission;

(H) Variance terms and conditions, including facility name, permit number, receiving stream name, first classified waterbody ID, discharge location, effective permit date, and the variance expiration date, will be incorporated into the Missouri Use Designation Dataset.

(13) Losing Streams.

(A) Losing stream determinations will usually be made upon the first application for discharge to a specific water or location within a watershed for a wastewater treatment facility, subdivision development, or animal waste management facility.

(B) Permits or other approvals for those applications will be processed in accordance with the determinations. Additional permits or approvals will be processed in accordance with the latest determination.

(C) For application purposes, any proposed facility within five (5) miles of a known losing stream segment should presume that facility's receiving stream segment is also losing until and unless a specific geologic evaluation is made of that stream and concludes the stream segment is gaining.

(D) Existing facilities operating under a state operating permit and new facilities being constructed under a construction permit in proximity to stream segments subsequently determined to be losing will be allowed to continue in operation at permitted or approved effluent limits for a period of time lasting the design life of the facility (usually twenty (20) years from the original construction completion), provided the facility is in compliance with its effluent limits and remains in compliance with those limits, and if neither of the following conditions is present:

1. If the discharge from such a facility can be eliminated by connection to a locally available facility, the facility shall be connected within three (3) years of the losing stream determination. A local facility shall be considered available if that facility or an interceptor is within two thousand feet (2000') or a distance deemed feasible by the department; and

2. If the discharge from such a facility is shown to cause pollution of groundwater, the facility shall be upgraded to appropriate effluent standards within three (3) years. The department shall include appropriate groundwater monitoring requirements in permits for any such facilities so that pollution, should it occur, would be detected.

(E) Any additional permits or approvals for increased treatment plant design capacity will be processed in accordance with the newest losing stream determination. No additional permits or approvals for any facilities shall be construed as lengthening the time for compliance with losing stream effluent limitations as established in subsection (13)(D).

(14) Severance. If a section, subsection, paragraph, sentence, clause, phrase, or any part of this rule be declared unconstitutional or invalid for any reason, the remainder of this rule shall not be affected and shall remain in full force and effect.

(15) Effective Date. This rule becomes effective immediately upon adoption and compliance with the requirements of subsection 644.036.3., RSMo, of the Missouri Clean Water Law and Chapter 536, RSMo.