



Colorado
Legislative
Council
Staff

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MEMORANDUM

August 15, 2011

TO: Interested Persons

FROM: Lauren Ris, Senior Research Assistant, 303-866-3264

SUBJECT: Water Nutrient Regulations and the Clean Water Act

This memorandum responds to House Joint Resolution 11-1025 that encourages Legislative Council Staff to prepare a summary of current and proposed nutrient regulations in Montana, North Dakota, South Dakota, Utah, New Mexico, Kansas, Arizona, Minnesota, Wisconsin, and Wyoming. The resolution also encourages the Water Quality Control Commission in the Department of Public Health and Environment to present its strategy to address nutrient regulations to a joint meeting of the Senate Agriculture, Natural Resources, and Energy Committee and the House Agriculture, Livestock, and Natural Resources Committee by January 31, 2012.

This memorandum provides background information on nitrogen, phosphorus, and the Clean Water Act; discusses the current status of proposed standards in Colorado and the associated costs to the state; and provides the status of the nutrient standards in the states requested in the resolution.

Background

Nitrogen and phosphorus. High levels of nitrogen and phosphorus in waters can produce harmful algal blooms. These blooms can produce "dead zones" in water bodies where dissolved oxygen levels are so low that most aquatic life cannot survive. This condition in water bodies is referred to as hypoxia. Factors that contribute to nitrogen and phosphorus pollution include overuse of fertilizer, runoff from cropland and developed areas, and overflow of septic systems. According to the U.S. Environmental Protection Agency (EPA), over the last 50 years, the amount of nitrogen and phosphorus pollution entering waters has escalated dramatically. With the U.S. population continuing to grow, the EPA expects this to be an increasing problem.

Clean Water Act. The federal Clean Water Act requires states to develop water quality standards and review and update these standards every three years.¹ Unlike toxic pollutant water quality standards, which must be numeric if possible, the act does not specifically require states to develop *numeric* nutrient water quality standards, giving states the discretion to use either narrative

¹33 U.S.C. Section 303 (c).

or numeric standards. Numeric criteria establish specific limitations on nitrogen and phosphorus concentrations in waterbodies, while narrative standards use descriptive language to convey an unacceptable water quality condition.

States must submit their water quality standards to the EPA for review and approval. If the EPA finds that a state's proposal for one or more criteria is inadequate, it must notify the state, which then has 90 days to revise its standards in response to EPA's concerns. If the state does not do so, the EPA is required to propose a federal standard that will apply to that state.

Numeric nutrient criteria. The EPA has been encouraging states to develop *numeric* nutrient criteria for nitrogen and phosphorus since 1998 through a series of policy memoranda. The most recent memorandum from March 2011 includes a framework for states to consider as they develop the water quality criteria. Policy memoranda and other guidance documents from the EPA are not regulations or mandates. States retain discretion to adopt water quality standards that may differ from the EPA recommendations, although the standards must ultimately be approved by the EPA.

Colorado

Rule-making process. The Water Quality Control Division in the Colorado Department of Health and Environment (CDPHE) is authorized to promulgate rules for water quality standards for phosphates, nitrates, and other dissolved nutrients, among other pollutants.² The division has been working on developing numeric nutrient criteria for nitrogen and phosphorus since the EPA first encouraged states to do so in 1998. A rule-making hearing before the Water Quality Control Commission to adopt the proposed nutrient criteria for nitrogen and phosphorus is scheduled for March 2012. The primary regulation that would be modified by the rule making is Regulation 31, the Basic Standards and Methodologies for Surface Water.

Costs of compliance. As referenced by House Joint Resolution 11-1025, a cost-benefit analysis is currently underway to determine the costs to entities in the state that will have to comply with newly adopted water quality standards. The study is being conducted by the Colorado Water Resources and Power Development Authority overseen by the Water Quality Control Division and will be completed in the fall of 2011. The resolution requests that the division present the results of this study to a joint meeting of the Senate Agriculture, Natural Resources, and Energy Committee and the House Agriculture, Livestock, and Natural Resources Committee before January 31, 2012.

Nutrient Criteria in Other States

Workshop. A workshop was held for EPA Region 8 (Colorado, Utah, Wyoming, Montana, South Dakota, and North Dakota) in February 2011 to discuss phosphorus and nitrogen criteria standards. Workshop participants included government regulators, stakeholders, and scientists.

²Section 25-8-204, C.R.S.

According to the summaries:

- Colorado and Montana are furthest along in adopting numeric standards;
- Utah is beginning the process; and
- South Dakota, North Dakota, and Wyoming are not developing numeric standards.

EPA report. The EPA published a status report in 2008 on nutrient criteria standards at the state level. The report summarizes the efforts of all 50 states in adopting criteria for their major water body types (rivers, streams, lakes, reservoirs, wetlands and estuaries). The report is available from Legislative Council Staff upon request.³

State nutrient regulations. In House Joint Resolution 11-1025, a summary of current and proposed nutrient regulations is requested for the following states: Arizona, Kansas, Minnesota, Montana, New Mexico, North Dakota, South Dakota, Utah, Wisconsin, and Wyoming. Table 1 summarizes each of the requested state's nutrient criteria standards. Table 2 provides more detail about each state's standards.

**Table 1
Summary of Numeric Criteria by State**

Status of Numeric Criteria in States	States
Adopted numeric nutrient standards for one or more parameters for an entire waterbody type.	Lakes/Reservoirs – Minnesota, Wisconsin, and Arizona Rivers/Streams – Wisconsin
Adopted numeric nutrient standards for one or more parameters for selected waters within a waterbody type.	Arizona, Colorado, Montana, and New Mexico
In the process of developing or adopting numeric standards.	Colorado, Montana, New Mexico, and Utah
Not developing numeric standards.	Kansas, North Dakota, South Dakota, and Wyoming

³EPA Status Report is available at: <http://water.epa.gov/scitech/swguidance/standards/criteria/nutrients/strategy/status.cfm>

**Table 2
Selected States' Nutrient Criteria Standards**

State	Nutrient Standard Summary												
<p>Arizona</p>	<p>Arizona has narrative standards for all surface water, numeric implementation criteria for lakes and reservoirs, and numeric criteria for specific streams.</p> <p>Surface water narrative standards. A surface water shall not contain pollutants in amounts or combinations that cause the growth of algae or aquatic plants that inhibit other aquatic life or impair recreational uses, and must also not contain pollutants that cause:</p> <ul style="list-style-type: none"> • objectionable odor in the area; • off-taste or odor in drinking water; • off-flavor in aquatic organism; and • change in the color of the surface water from natural background levels of color. <p>Draft numeric implementation criteria for lakes and reservoirs. The targets for lakes and reservoirs depend on the designated use and depth of the water body. For example, for deep waters used for swimming or where there is partial body contact, the total phosphorus target is 0.07 milligrams per liter (mg/L) and the total nitrogen target is 1.2 -1.4 mg/L.</p> <p>Numeric criteria for specific water bodies. Nitrogen and phosphorus criteria have been developed for 12 Arizona rivers and their tributaries. Criteria are provided for the annual mean, the 90th percentile, and a single sample maximum. A minimum of 10 samples, each taken at least 10 days apart in a consecutive 12-month period are required to develop a 90th percentile and not more than 10 percent of the samples may exceed the 90th percentile value. For example, the criteria for the Verde River and its tributaries expressed in mg/L are:</p> <table border="1" data-bbox="370 1014 1263 1094"> <thead> <tr> <th></th> <th align="center"><u>Annual Mean</u></th> <th align="center"><u>90th Percentiles</u></th> <th align="center"><u>Single Sample</u></th> </tr> </thead> <tbody> <tr> <td>Total phosphorus</td> <td align="center">0.10</td> <td align="center">0.30</td> <td align="center">1.00</td> </tr> <tr> <td>Total nitrogen</td> <td align="center">1.00</td> <td align="center">1.50</td> <td align="center">3.00</td> </tr> </tbody> </table> <p><i>Source: Arizona Administrative Code, 18-11-108</i></p>		<u>Annual Mean</u>	<u>90th Percentiles</u>	<u>Single Sample</u>	Total phosphorus	0.10	0.30	1.00	Total nitrogen	1.00	1.50	3.00
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<p>Colorado</p>	<p>Currently, Colorado has narrative standards for surface waters and numeric criteria for specific reservoirs. However, the Colorado Water Quality Control Division (division) has been working on developing statewide numeric nutrient criteria for lakes, reservoirs, and rivers for over ten years. A nutrient criteria rulemaking hearing with the Water Quality Control Commission was originally scheduled for June 2010, but has been delayed twice, most recently to allow time to conduct a cost-benefit study. The hearing is now scheduled for March 2012. The division has engaged a stakeholder work group throughout the process.</p> <p>Narrative standards. Surface waters (except wetlands) must be free from substances attributable to human-caused point source or nonpoint source discharge in amounts which:</p> <ul style="list-style-type: none"> • produce color, odor, other conditions in such a degree as to create a nuisance or harm existing beneficial uses or impart any undesirable taste to significant edible aquatic species or to the water; or • produce a predominance of undesirable aquatic life. <p>Surface waters in wetlands must be free from substances attributable to human-caused point source or nonpoint source discharge in amounts which:</p> <ul style="list-style-type: none"> • produce color, odor, changes in pH, or other conditions in such a degree as to create a nuisance or harm water quality dependent functions or impart any undesirable taste to significant edible aquatic species of the wetland. 												

Table 2
Selected States' Nutrient Criteria Standards (Cont.)

State	Nutrient Standard Summary
<p>Colorado (Cont.)</p>	<p>Numeric criteria for specific water bodies. Colorado currently has numeric nutrient criteria for five specific reservoirs expressed in mg/L:</p> <ul style="list-style-type: none"> • Chatfield Reservoir: total phosphorus = 0.30, chlorophyll = 0.010 • Cherry Creek Reservoir: chlorophyll= 0.018 • Bear Creek Reservoir: total phosphorus = 0.032, chlorophyll = 0.010 • Dillon Reservoir: total phosphorus = 0.007 • Standley Lake: chlorophyll = 0.004 <p>Proposed numeric criteria. The division has proposed regulations that establish interim numeric values for phosphorus, nitrogen, and chlorophyll a for rivers, streams, lakes, and reservoirs. All parameters are based on the size and temperature of the lake or reservoir and the temperature of the river or stream. The division also has proposed statewide nutrient control regulations which establish:</p> <ul style="list-style-type: none"> • technology-based effluent limits for most wastewater dischargers with significant nutrient concentrations; • requirements that Municipal Separate Storm Sewer System (MS4s) dischargers develop a public education and outreach program about stormwater runoff; • requirements for enhanced nutrients management and monitoring by MS4s; • discharger monitoring requirements; and • voluntary control and monitoring provisions for nonpoint sources in the first phase of implementation, with potential regulatory requirements after the initial phase. <p><i>Source: Colorado Code of Regulations, 5-1002, regulations 31-38</i></p>
<p>Kansas</p>	<p>Kansas has narrative nutrient standards based on water use classifications. Kansas also has a Surface Water Nutrient Reduction Plan which establishes overall nitrogen and phosphorus reduction targets of 30 percent from 2004 levels.</p> <p>General surface water criteria. Surface water must:</p> <ul style="list-style-type: none"> • be free, at all times, from the harmful effects of substances that originate from artificial sources of pollution and that produce any public health hazard, nuisance condition, or impairment of a designated use; • be free of taste-producing and odor-producing substances of artificial origin at concentrations that interfere with the production of potable water by conventional water treatment processes, that impart an unpalatable flavor to edible aquatic life or terrestrial wildlife, or result in noticeable odors in the vicinity of surface waters; • not be altered by the addition of color-producing or turbidity-producing substances of artificial origin. <p>Aquatic life support criteria for lakes, wetlands, and ponds. The introduction of plant nutrients into streams, lakes, or wetlands from artificial sources must be controlled to prevent the accelerated succession or replacement of aquatic biota or the production of undesirable quantities or kinds of aquatic life.</p> <p>Domestic water supply use. The introduction of plant nutrients into surface waters designated for domestic water supply use must be controlled to prevent interference with the production of drinking water.</p> <p>Recreational use. The introduction of plant nutrients into surface waters designated for primary or secondary contact recreational use must be controlled to prevent the development of objectionable concentrations of algae or algal by-products or nuisance growths of submersed, floating, or emergent aquatic vegetation.</p> <p><i>Source: Kansas Administrative Regulations, 28-16-28</i></p>

**Table 2
Selected States' Nutrient Criteria Standards (Cont.)**

State	Nutrient Standard Summary												
<p>Minnesota</p>	<p>Minnesota has general narrative standards for surface waters and has numeric criteria for phosphorus in lakes and reservoirs based on designated ecoregions. The state Pollution Control Agency is working on adopting river eutrophication standards that include phosphorus. The state is not planning to adopt nitrogen standards for purposes of addressing eutrophication. However, they are working toward a nitrogen aquatic life toxicity standard. Rulemaking hearings for these standards have not yet been scheduled.</p> <p>Narrative standard. All waters that support fish, other aquatic life, bathing, boating, or other recreational purposes must not experience any material increase in undesirable slime growths or aquatic plants, including algae, or have any significant increase in harmful pesticide or other residues in the waters, sediments, and aquatic flora and fauna. The normal fishery and lower aquatic biota upon which it is dependent and the use of the water must not be seriously impaired or endangered, the species composition must not be altered materially, and the propagation or migration of the fish and other biota normally present must not be prevented or hindered by the discharge of any sewage, industrial waste, or other wastes to the waters.</p> <p>Additionally, for all waters of the state, no sewage, industrial waste, or other wastes may be discharged from either point or nonpoint sources into any waters of the state so as to cause any nuisance conditions such as excessive growths of aquatic plants, or other offensive or harmful effects.</p> <p>Numeric standard. In evaluating whether the narrative standards prohibiting any increase in undesirable slime growths or aquatic plants are being met, the following data are used:</p> <ul style="list-style-type: none"> • summer-average (June through September) of total phosphorus and total nitrogen measured in the water body throughout the summer growing season; • summer-average of chlorophyll measured in the water body throughout the summer growing season; and • representative measurements of light transparency in the water body. <p>The following phosphorus criteria for lakes and reservoirs is based on types of lakes and reservoirs and by designated ecoregion:</p> <table border="0" style="width: 100%;"> <thead> <tr> <th style="text-align: left;"><u>Type and Ecoregion</u></th> <th style="text-align: right;"><u>Phosphorus (mg/L)</u></th> </tr> </thead> <tbody> <tr> <td>Lake trout lakes in all ecoregions</td> <td style="text-align: right;">0.012</td> </tr> <tr> <td>Trout lakes in all ecoregions except lake trout lakes</td> <td style="text-align: right;">0.020</td> </tr> <tr> <td>Lakes, shallow lakes, and reservoirs in Northern Lakes and Forest</td> <td style="text-align: right;">0.030</td> </tr> <tr> <td>Lakes and reservoirs in North Central Hardwood Forest</td> <td style="text-align: right;">0.040</td> </tr> <tr> <td>Lakes and reservoirs in Western Corn Belt Plains and Northern Glaciated Plains</td> <td style="text-align: right;">0.065</td> </tr> </tbody> </table> <p>Phosphorus effluent limits for point source discharges of sewage, industrial, and other wastes. Phosphorus is limited to 1.0 mg/L in discharge of effluent:</p> <ul style="list-style-type: none"> • is directly to or affects a lake, shallow lake, or reservoir; • is to specific basins and water bodies; or • was not in existence before May 1, 2008, or has since expanded to more than 1,800 pounds of total phosphorus per year. <p><i>Source: Minnesota Administrative Rules, Chapters 7050 and 7053</i></p>	<u>Type and Ecoregion</u>	<u>Phosphorus (mg/L)</u>	Lake trout lakes in all ecoregions	0.012	Trout lakes in all ecoregions except lake trout lakes	0.020	Lakes, shallow lakes, and reservoirs in Northern Lakes and Forest	0.030	Lakes and reservoirs in North Central Hardwood Forest	0.040	Lakes and reservoirs in Western Corn Belt Plains and Northern Glaciated Plains	0.065
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State	Nutrient Standard Summary
<p>Montana</p>	<p>Montana has numeric standards for nitrogen and phosphorus for summer flows on the Clark Fork River, which were adopted in 2002. The State Department of Environmental Quality (DEQ) is in the process of developing numeric phosphorus and nitrogen standards for wadeable streams statewide and the Yellowstone River and has been working with a stakeholder group to address cost-related issues. A rulemaking hearing is planned for February 2012. The department is also proceeding with criteria for lakes and reservoirs.</p> <p>Legislation. In 2011, Senate Bill 367 was passed requiring the DEQ to approve variances from the to be promulgated criteria for many domestic dischargers. Senate Bill 95 was also passed in 2009 that allows for nutrient trading. Trading would allow nutrient dischargers to trade credits for a reduction in nutrient loads greater than the regulatory requirements within the same watershed. The department has a draft trading policy nearly completed.</p> <p>Narrative standards. Montana has narrative standards based on water use classifications that generally relate to prohibiting or limiting water color changes and nutrient parameters.</p> <p>Clark Fork River numeric standards. There are separate standards for two segments of the Clark Fork River, both of which only apply from June 21 to September 2. The standards for the segment of the mainstem from below the Warm Springs Creek confluence to the confluence with the Blackfoot River are:</p> <ul style="list-style-type: none"> • total phosphorus - 0.020 mg/L • total nitrogen - 0.300 mg/L <p>The standards for the segment of the river from the confluence with the Blackfoot River to the confluence with the Flathead River are:</p> <ul style="list-style-type: none"> • total phosphorus - 0.039 mg/L • total nitrogen - 0.300 mg/L <p><i>Source: Administrative Rules of Montana 17.30.631</i></p>
<p>New Mexico</p>	<p>New Mexico currently has statewide narrative criteria and numeric phosphorus criteria for select waterbodies and is in the process of developing numeric standards.</p> <p>General narrative criteria. The New Mexico Water Quality Control Commission has adopted the following criteria for surface waters :</p> <ul style="list-style-type: none"> • color-producing materials resulting from other than natural causes must not create an aesthetically undesirable condition or impair the use of the water; • Water contaminants from other than natural causes must be limited to concentrations that will not impart unpalatable flavor to fish; • water contaminants from other than natural causes must be limited to concentrations that will not result in offensive odor or taste arising in a surface water or otherwise interfere with the reasonable use of the water; and • plant nutrients from other than natural causes must not be present in concentrations that will produce undesirable aquatic life or result in dominance of nuisance species in surface waters of the state. <p>Site-specific criteria. There are numeric phosphorus criteria for stream reaches in the Rio Grande, Pecos, and San Juan River Basins of .01 mg/L or less.</p>

Table 2
Selected States' Nutrient Criteria Standards (Cont.)

State	Nutrient Standard Summary									
<p>New Mexico (Cont.)</p>	<p>Nutrient assessment protocol. In May 2011, the New Mexico Environment Department released a Nutrient Assessment Protocol for wadeable streams to determine nutrient impairment status of wadeable, perennial streams. Among other indicators, the assessment uses total nitrogen and total phosphorus thresholds based on cold water and warm water uses of streams by ecoregions. For example, the thresholds for the Arizona/New Mexico Mountains ecoregion are:</p> <table border="0" data-bbox="370 527 1175 638"> <thead> <tr> <th></th> <th align="center"><u>Cold Water</u></th> <th align="center"><u>Transitional and Warm Water</u></th> </tr> </thead> <tbody> <tr> <td>Nitrogen</td> <td align="center">0.25 mg/L</td> <td align="center">0.29 mg/L</td> </tr> <tr> <td>Phosphorus</td> <td align="center">0.02 mg/L</td> <td align="center">0.05 mg/L</td> </tr> </tbody> </table> <p><i>Source: New Mexico Administrative Code, 20-6-4</i></p>		<u>Cold Water</u>	<u>Transitional and Warm Water</u>	Nitrogen	0.25 mg/L	0.29 mg/L	Phosphorus	0.02 mg/L	0.05 mg/L
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Nitrogen	0.25 mg/L	0.29 mg/L								
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<p>North Dakota</p>	<p>North Dakota has narrative standards for nutrients as well as a rule that prohibits point source discharges directly to lakes. The Department of Environment and Natural Resources does not have any plans for adopting numeric nutrient criteria in the near future.</p> <p>Narrative standards. All surface waters must be:</p> <ul style="list-style-type: none"> • free from substances attributable to municipal, industrial, or other discharges or agricultural practices that will cause the formation of putrescent or otherwise objectionable sludge deposits; • free from floating debris, oil, scum, and other floating materials attributable to municipal, industrial, or other discharges or agricultural practices in sufficient amounts to be unsightly or deleterious; • free from materials attributable to municipal, industrial, or other discharges or agricultural practices producing color, odor, or other conditions that create a nuisance or make fish inedible; • free from substances attributable to municipal, industrial, or other discharges or agricultural practices in concentrations or combinations which are toxic or harmful to humans, plants, or resident aquatic biota; and • free from oil or grease residue attributable to wastewater which causes a visible film or sheen upon the waters or causes a sludge or emulsion to be deposited beneath the surface of the water or shorelines. <p>There must also be no discharge of pollutants that:</p> <ul style="list-style-type: none"> • cause a public health hazard; • injure environmental resources; • impair existing or reasonable beneficial uses; or • directly or indirectly cause concentrations of pollutants to exceed applicable standards of the receiving waters. <p><i>Source: North Dakota Century Code 33-16-02.1-08</i></p>									
<p>South Dakota</p>	<p>South Dakota has narrative nutrient water quality standards and a requirement that concentrated animal feeding operations must include standards for minimizing nitrogen and phosphorus nonpoint source discharges. There are no plans to adopt numeric nutrient criteria in the near future. South Dakota was using a water quality assessment tool called the Trophic State Index (TSI), which is a classification system designed to "rate" individual lakes, ponds, and reservoirs based on the amount of biological productivity occurring in the water. EPA expressed concerns about this approach and South Dakota has gone back to using numeric criteria such as pH, suspended solids, and dissolved oxygen to assess its waters.</p>									

Table 2
Selected States' Nutrient Criteria Standards (Cont.)

State	Nutrient Standard Summary
<p>South Dakota (Cont.)</p>	<p>Narrative standards. The South Dakota's Department of Environment and Natural Resources has established the following narrative standards for nutrients:</p> <ul style="list-style-type: none"> • Wastes discharged into surface waters of the state may not contain a parameter which violates the criterion for the waters' existing or designated beneficial use or impairs the aquatic community as it naturally occurs. • Raw or treated sewage, garbage, rubble, unpermitted fill materials, municipal wastes, industrial wastes, or agricultural wastes which produce floating solids, scum, oil slicks, material discoloration, visible gassing, sludge deposits, sediments, slimes, algal blooms, fungus growths, or other offensive effects may not be discharged or caused to be discharged into surface waters. • Materials which produce nuisance aquatic life may not be discharged or caused to be discharged into surface waters of the state in concentrations that impair an existing or designated beneficial use or create a human health problem. • Nonpoint source discharges must be controlled utilizing cost-effective methods and reasonable best management practices. • Any permit for a concentrated animal feeding operation must include technical standards for nutrient management to minimize nitrogen and phosphorus transport from land application fields to surface waters. <p><i>Source: Administrative Rules of South Dakota 74-51-01 and 74-52-02-30</i></p>
<p>Utah</p>	<p>Utah has narrative water quality standards and is starting to collect data in order to develop numeric criteria; however, no specific nutrient criteria have been developed.</p> <p>Narrative standards. It is unlawful for any person to discharge or place any waste or other substance in such a way as will be or may become offensive such as unnatural deposits, floating debris, oil, scum, or other nuisances such as color, odor, or taste; or cause conditions which produce undesirable aquatic life or which produce objectionable tastes in edible aquatic organisms; or result in concentrations or combinations of substances which produce undesirable physiological responses in desirable resident fish or other desirable aquatic life, or undesirable human health effects.</p> <p><i>Source: Utah Administrative Code R317-2-7</i></p>

Table 2
Selected States' Nutrient Criteria Standards (Cont.)

State	Nutrient Standard Summary
<p>Wisconsin</p>	<p>Wisconsin has numeric phosphorus criteria for rivers, streams, and lakes.</p> <p>Narrative criteria. Floating or submerged debris, oil, scum, or other material may not be present in amounts that interfere with public rights in waters of the state. Materials producing color, odor, taste, or unsightliness may not be present in amounts that interfere with public rights in waters of the state.</p> <p>Numeric phosphorus criteria. For 46 specific streams and rivers, the total phosphorus standard is 0.010 mg/L. All other streams and rivers must meet a total phosphorus criteria of 0.075 mg/L. Reservoirs and lakes must meet total phosphorus criteria as follows:</p> <ul style="list-style-type: none"> • stratified reservoirs* - 0.030 mg/L • reservoirs that are not stratified - 0.040 mg/L • stratified, two story fishery lakes - 0.015 mg/L • drainage stratified lakes - 0.040 mg/L • seepage stratified lakes** - 0.020 mg/L • seepage lakes that are not stratified - 0.040 mg/L • open and nearshore waters of Lake Superior - 0.005 mg/L • open and nearshore waters of Lake Michigan - 0.007 mg/L <p>* Stratified reservoirs are reservoirs with several thermal layers of water. ** Seepage lakes are closed lakes that lose water through the walls and floor of its basin.</p> <p>Ephemeral streams, lakes and reservoirs less than 5 acres in surface areas, wetlands, and certain other waters identified as "limited aquatic life" are excluded from the phosphorus criteria.</p> <p><i>Source: Wisconsin Natural Resources Code 102.06</i></p>
<p>Wyoming</p>	<p>Wyoming has narrative standards, and does not have plans to adopt numeric criteria in the near future.</p> <p>Narrative standards. All Wyoming surface waters must be free from substances and conditions which are attributable to or influenced by the activities of man in concentrations which produce undesirable aquatic life. In all Wyoming surface waters, floating and suspended solids attributable to or influenced by the activities of man must not be present in quantities which could result in significant aesthetic degradation, significant degradation of habitat for aquatic life or adversely affect public water supplies, agricultural or industrial water use, plant life, or wildlife.</p> <p><i>Source: Wyoming Water Quality Rules and Regulations, Chapter 1, Sections 16 and 29</i></p>

Additional source: Nutrients and Water Quality Region 8 Workshop Summary, February 2011