KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT

BUREAU OF WATER

WATER QUALITY STANDARDS WHITE PAPER

ANTIDEGRADATION

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ANTIDEGRADATION

ISSUE

How should Kansas implement the antidegradation requirements of the Clean Water Act?
It is the mission of the Kansas Department of Health and Environment (KDHE) to protect the health and environment of all Kansans by promoting responsible choices. One facet of this mission is the setting of water quality standards based on the best science available.

CURRENT STANDARD

Antidegradation as currently applicable is described in Kansas regulation – KAR 28-16-28c(a) (KAR, 2006). The *Kansas Antidegradation Policy* (KDHE, 2001) which provides additional detail and implementation guidance is adopted by reference in KAR 28-16-28b(ff). States are required to have antidegradation policies as a part of their water quality standards pursuant to federal regulation adopted subsequent to the federal Clean Water Act – 40 CFR §131.6(d) (CFR, 2009a). The general content of an antidegradation policy is explained in 40 CFR §131.12 (CFR, 2009b).

BACKGROUND

An antidegradation policy is one of the three required components of a state's water quality standards. The other components are designated uses and water quality criteria. The basic purpose of an antidegradation program is to promote the maintenance and protection of existing water quality (EPA, 1993). Therefore, the intent of the antidegradation policy is to limit discharges and other activities that will negatively impact water quality, impair designated uses, or threaten to impair designated uses of surface waters. The antidegradation policy provides a baseline level of protection relative to established water quality criteria to all classified surface waters, and a higher level of protection to those waterbodies recognized as unique ecologically, highly valued for their resources, or having high water quality.

Kansas has had an EPA-approved antidegradation policy in place since 2001. The policy contains some basic implementation information, however further definition of implementation has been identified by the regulated community as a needed enhancement to the policy. Further, numerous lawsuits across the nation have led to case law dictating changes in interpretation of states' antidegradation policies.

The key issues covered in this White Paper include: 1) identification of Tier 2 waters, 2) development of economic or social justification, 3) development of an alternatives analysis, and 4) application of a *de minimis* provision.

Identification of Tier 2 Waters

The Federal antidegradation regulation, 40 CFR §131.12, requires states to identify three tiers of waters. Tier 1 waters are those where water quality can approach the criteria thresholds and uses are met. Discharges to Tier 1 waters are expected to ensure that existing uses of the water are maintained. Tier 2 waters are those waters where water quality is better than the criteria thresholds. Discharges to Tier 2 waters are required to minimally impact the water unless minimally impacting alternatives are too costly, and there are important economic or social reasons for allowing the discharge. Tier 3 waters are those that are referred to as Outstanding National Resource Waters (ONRWs). ONRWs consist of waters in National and State parks and wildlife refuges, and waters of exceptional recreational or ecological significance and often do not possess exceptional quality. Discharges to Tier 3 waters are prohibited unless the discharge has no impact on water quality. In Kansas, there are seven ONRWs: Quivira Big Salt Marsh, Quivira Little Salt Marsh, Cheyenne Bottoms, Flint Hills National Wildlife Refuge, Kirwin Lake, Kirwin National Wildlife Refuge, and the Cimarron National Grasslands (KDHE, 2009). Regardless of tier, a new or expanded discharge will not be approved unless existing instream water uses and the level of water quality necessary to protect the existing uses is maintained and protected.

Tier 2 waters are the key to any antidegradation policy. These waters have a higher quality than needed to maintain designated uses, and the goal is to maintain that high quality to the greatest extent possible. Therefore, in order to allow a new or expanded discharge into a Tier 2 water, the potential permittee must make a showing that the discharge is needed to support important economic or social development in the area of the discharge. Once the social or economic development need has been established, the potential permittee must review alternative treatment options to ascertain the cost and impact on water quality of each of those schemes. When KDHE and the permittee agree on the need for a discharge and a cost effective level of treatment, that decision is subject to public review.

Tier 2 waters can be identified by one of two schemes – Pollutant-by-Pollutant (PbP) or Waterbody-by-Waterbody (WbW). Variations of each approach have been approved by EPA.

Waterbody by Waterbody

The WbW approach involves identifying specific waterbodies by tier. Three basic schemes are used to identify Tier 2 waters:

1. Those waters not on a state's list of impaired waters (303d list), not having a Total Maximum Daily Load[1] (TMDL) in place, or not having been assessed for impairment. All impaired waters are considered Tier 1, unless they have been assigned a Tier 3 designation.

2. Those waters where a suite of chemical and biological parameters are below their specified criteria by a defined percentage amount. All other waters are considered Tier 1 unless they have been assigned a Tier 3 designation.

[1] A Total Maximum Daily Load is a calculation of the maximum amount of a pollutant that a waterbody can receive and still safely meet water quality standards.

3. Those waters that have quality better than existing criteria and have a high intrinsic value. An example of this type of water could be the Kansas River. The Kansas River has good, but not exceptional water quality. The river does have a high intrinsic value due to public access, recreational potential, and it serves as the source of drinking water for nearly 600,000 Kansans.

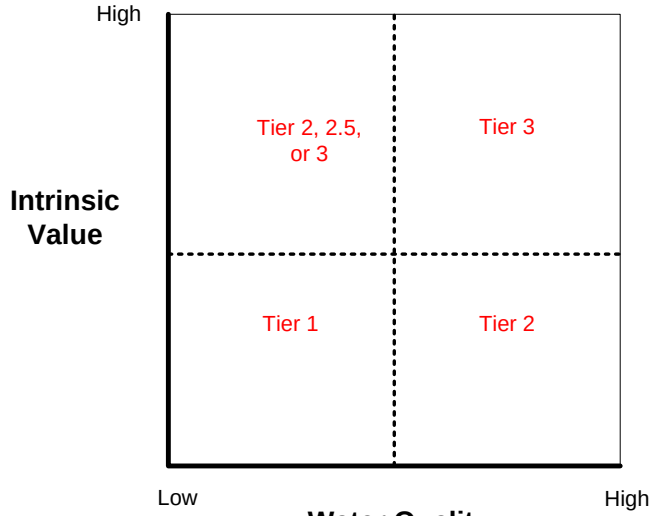

Figure 1

All other waters are considered Tier 1 unless they have been assigned a Tier 3 designation. The graphic in Figure 1 illustrates this concept.

The first method has withstood appeals in Kentucky (Kentucky Waterways Alliance v. Johnson, 2008). The key to the ruling is that waters not assessed are considered Tier 2.

In Kansas, individual stream segments are not assessed for 303d listing purposes – entire watersheds are assessed. Therefore, if monitoring at the bottom of a watershed indicates impairment, all stream segments in the watershed are considered impaired. This method likely would not pass muster of the courts since many individual stream segments are never assessed. Thus, if Kansas were to revert to this method of Tier 2 identification, only the stream segments with monitoring data would be evaluated for designation as Tier 1 or Tier 2. All "non-assessed" waters would be considered Tier 2.

One flaw with this method of identifying Tier 2 waters is that a water with a single impairment would be considered Tier 1, thus allowing the water quality to be degraded up to the numeric limit for all other parameters. As an example, a large number of waters in Kansas are impaired for bacteria. Bacteria impairments tend to occur less than 25% of the time in impaired waters and are generally related to runoff at high flow conditions. However, because of the intermittent impairment, the water would be identified as Tier 1 and all other pollutants - mercury, sulfate, chloride, ammonia, benzene, etc. – would be allowed to be discharged to the point the criteria are just met in the receiving water with no review of other treatment methods that could lessen the impact on the water quality.

The second method requires long term monitoring for each waterbody. In Kansas, there are 2,022 stream segments. Sufficient monitoring exists on around 500 of those segments. It is doubtful sufficient funding is available to capture adequate monitoring data on the remaining segments. Another option is one used by the Missouri Department of Natural Resources (MDNR) that requires a proposed permittee to establish the quality of the waterbody where a new or expanded

discharge is sought. Those data must be collected according to a quality assurance project plan approved by MDNR and collected at times representative of critical low flow conditions. Thus, the sample collection and data analysis could take a considerable amount of time. While this method is both fiscally and resource intensive, it would identify a smaller set of Tier 2 waters on which to focus the state's resources.

The last method would have the advantage of combining some water quality data with an assessment of a water's intrinsic value. This would require much less sampling, but would require a greater degree of public discussion on the intrinsic value of individual waters. It would allow state to focus resources on waters that are truly significant in the public's eye.

Pollutant by Pollutant

The PbP approach considers each pollutant as being Tier 1 or Tier 2. In the previous example, a stream intermittently impaired only for bacteria would be considered as Tier 1 for bacteria. Any other pollutant below its criterion threshold would be considered Tier 2, and a Tier 2 review would be required. Under this scheme, most proposed new and expanded discharges would require a Tier 2 review for at least some pollutants.

The PbP approach is generally thought to be more protective than the WbW approach due to the fact all waters have some parameters that are below their specified numeric criteria. It is also recognized this method generally is more costly and time consuming for the public and KDHE to implement due to the fact every new or expanded discharge would require a Tier 2 review. This is the current approach being utilized by KDHE. An overabundance of Tier 2 reviews generally drives the regulated community and KDHE to look for exceptions to the rule – particularly a *de minimis* provision exempting small discharges from review.

Options:

1. Identify Tier 2 waters on a waterbody-by-waterbody basis.
   + Quality only
   + Quality and intrinsic value

2. Identify Tier 2 waters on a pollutant-by-pollutant basis

Development of Social or Economic Justification

The federal antidegradation regulation requires there be a finding by the state that a discharge lowering water quality is necessary to support important economic or social development in the area in which the waters are located. That finding must undergo intergovernmental review and is subject to public participation via the public notification provisions in Kansas regulation. Public comment is invited during the permit public notice period for reconsideration or support of the KDHE proposed action. In the event of significant public interest or concern, KDHE will conduct a public hearing on the proposed permitting action.

In the past, KDHE has referred to EPA's *Interim Economic Guidance for Water Quality Standards, Standards, March 1995* (EPA-823-b-95-002) as the reference for demonstrating important social or economic impact.

Examples provided in EPA's document (EPA, 1995) include positive changes in the following indicators:

- Median Household Income
- Community Unemployment Rate
- Overall Net Debt as a Percent of Full Market Value of Taxable Property
- Percent of Households Below Poverty Line
- Community Development Potential
- Impact on Property Values

The document is now outdated and may not cover the wide range of methods that could demonstrate important economic or social impact.

Options:

1. Exclusively utilize EPA's *Interim Economic Guidance for Water Quality Standards, Standards, March 1995"* that would be satisfactory for demonstrating important economic or social impact.

2. Utilize methods identified in EPA's *Interim Economic Guidance for Water Quality Standards, Standards, March 1995"* along with other identified mechanisms to demonstrate important economic or social impact. What would some of those mechanisms be?

Alternatives Analysis

Once important social or economic impact has been established, an alternatives analysis (AA) is required. An AA consists of identifying wastewater treatment options and associated costs. The purpose of the AA is to identify the least impacting, cost effective treatment method for a new or expanded discharge. Each proposed new or expanded discharger would need to conduct the analysis to determine treatment options and costs. In some cases, it is anticipated no discharge of wastewater may be the best alternative. The AA also requires the cost effectiveness of the options to be evaluated. Some options may not be affordable, while some may be affordable but provide very little environmental benefit. Each of those concepts feed into a cost effectiveness evaluation.

The alternatives analysis component of antidegradation has been a key issue in numerous lawsuits brought against EPA and the states. Some advocate for a mandatory acceptance of the least impacting alternative that is deemed affordable. The basis for that advocacy is maintenance of the highest quality water based on affordability in lieu of cost effectiveness.

Others advocate for the requirement of the most cost-effective option. A cost-effectiveness approach would not necessarily mandate the use of the least impacting affordable option. Instead, a cost-effectiveness approach would take into account other factors such as the cost to pollutant removal ratio and other environmental costs borne by an entity. In the case of a municipality that might be costs associated with provision of drinking water.

Options:

1. Mandatory acceptance of the least impacting affordable alternative.

2. Accept the most cost effective alternative.

De Minimis **Provision**

De minimis provisions in the implementation of antidegradation allow for insignificant water quality degradation to be excluded from Tier 2 review. *De minimis* is a Latin term meaning "concerning trifles" or being so minor to merit disregard. If a new or expanded discharge is determined to have a minor impact on water quality, a Tier 2 review is waived regardless of the existing water quality. The key to *de minimis* is the determination of insignificance. Several courts have held that *de minimis* means no more than a 10% increase. EPA has also established policy that a *de minimis* discharge is no more than a 10% decrease in water quality for any given waterbody, and the maximum aggregate decrease in water quality based on multiple *de minimis* findings is 20% for a waterbody (King, 2006). What constitutes a 10% increase however can be defined in different ways – either 10% of the "assimilative capacity" of a waterbody or 10% above the existing concentration of a pollutant.

Assimilative capacity is defined as the difference between existing water quality and the criterion value for a pollutant. The irony of using an assimilative capacity approach is that the higher the quality of a water, the more pollutant can be added – seemingly contrary to the purpose of antidegradation which is to maintain the highest quality of a water. Conversely, defining the 10% increase in pollution as 10% above the existing baseline concentration of a pollutant in a waterbody affords a more protective approach by allowing less additional pollutant concentration in the highest quality waters. An illustration of the two concepts is shown in Figure 2.

In either case, some type of cap is required such that multiple *de minimis* allowances do not change a water from Tier 2 to Tier 1 without a discharge undergoing a Tier 2 review. The EPA concept of a 20% cap in assimilative capacity is unwieldy to implement. The concept would require a baseline value be established for each waterbody such that a cap could be established for the 20% increase. The value established for the 20% increase for each waterbody would have to be maintained by KDHE in perpetuity and an assessment be made as to when the 20% cap was met. In Kansas, there are typically fewer than 20 new or expanded discharges each year. Thus, it could take decades (if ever) before the 20% cap would be reached. Maintaining the cap information over that length of time would be difficult. It would also overlook the potential for intermediate water quality degradation due to natural sources or nonpoint sources.

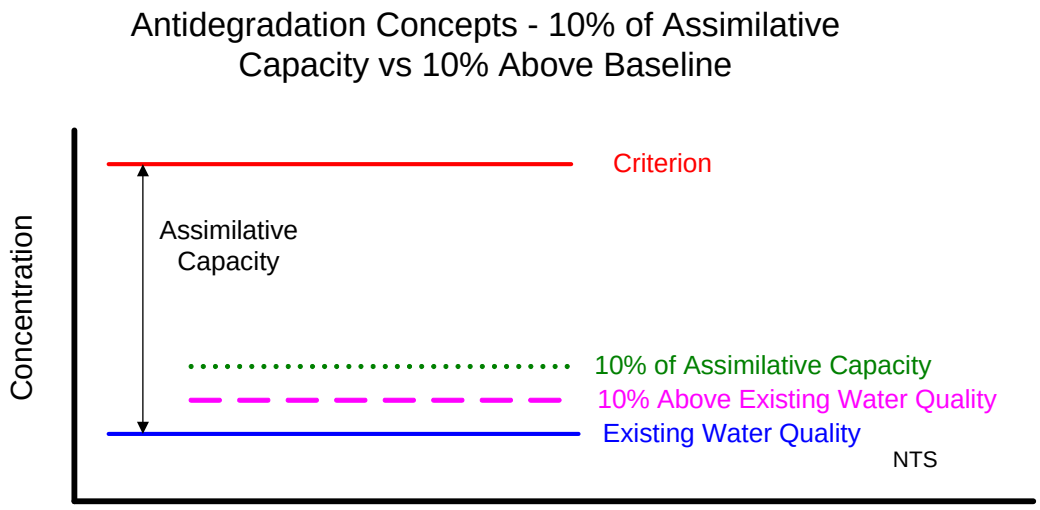

Figure 2

In lieu of the 20% cap on assimilative capacity, an alternate option would be to review the existing water quality and limit any use of *de minimis* only to those waters where the existing quality was a certain percentage below the criteria values – say 50%. In other words, a *de minimis* exclusion would not be considered a viable option if existing water quality was at or above 50% of the existing criteria values. In this manner, long term record keeping for each *de minimis* exclusion would not be necessary. This methodology would also take into account natural and nonpoint source contributions to water quality.

A second concept intertwined in the *de minimis* discussion is the amount of degradation that is considered to be insignificant. As mentioned previously, the courts have held that 10% degradation is the maximum considered to be *de minimis*. A 10% change in a large waterbody like the Kansas River, however represents a large amount of pollution as opposed to a 10% change in quality in a smaller waterbody like Cowskin Creek. Therefore, an option to an across-the-board 10% *de minimis* degradation provision is a tiered proposal based on the rate of flow – for waterbodies with a high rate of flow, a lower de minimis allowance would be provided, whereas waterbodies with a low rate of flow would be provided a higher *de minimis* allowance – up to 10%.

Option:

1. Provide a *de minimis* provision in the Kansas antidegradation policy.
2. Do not provide a *de minimis* provision in the Kansas antidegradation policy.

Option: If a *de minimis* provision is included in the Kansas antidegradation policy:

1. *De minimis* discharges should be based on a percentage of assimilative capacity.
2. *De minimis* discharges should be based on a percentage increase above the existing water quality.

Option: If a *de minimis* provision is included in the Kansas antidegradation policy:

1. *De minimis* should be defined as the same percentage decrease in water quality.
2. *De minimis* should be defined as tiered percentage based on stream flow.

SUMMARY

Antidegradation implementation is an issue that has been identified by the regulated community as a needed enhancement to the *Kansas Antidegradation Policy*. Further, numerous lawsuits across the nation have led to case law dictating changes in interpretation of antidegradation policies. Therefore, KDHE is proposing to clarify several issues in the Policy including 1) identification of Tier 2 waters, 2) development of economic or social justification 3) development of an alternatives analysis, and 4) application of a *de minimis* provision.

Impact Considerations: Currently, all new or expanded discharges have been subject to a Tier 2 antidegradation analysis that ranges from $1000 to $25,000 in cost. Many of the options discussed in this white paper, in streamlining the antidegradation review process, tend to decrease costs to the potential permittee but incur additional analysis cost to KDHE. Assigning Tier 2 protections to individual state waters will still incur State costs from analysis of the existing water quality of those waters, whether looking at the waterbody as a whole or looking at individual pollutants. Any Tier 2 designation will impose alternative analysis costs to new dischargers to such waters.

Providing a flexible mechanism to demonstrate economic or social impacts would likely lower costs to dischargers from the status quo requirements of today. Costs of alternatives are a direct function of impact and mandates. Options that impact the environment the least are typically more expensive than those that weigh marginal costs with the incremental benefit realized by a particular alternative. Provision of *de minimis* conditions creates a threshold that insulates small scale discharge impacts from the brunt of antidegradation requirements. How that *de minimis* provision is derived will influence the extent of cost savings to dischargers, albeit, with a tradeoff in the absolute protections provided to existing water quality.

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