PROPOSED

Creation of Sensitive Water Supply Reuse Classification in Oklahoma’s Antidegradation Policy

November 4, 2015
Creation of a Sensitive Water Supply Reuse Classification in Oklahoma's Antidegradation Policy

Introduction
When the Oklahoma Legislature passed the Water for 2060 Act (House Bill 3055) in 2012, it set forth an unprecedented goal of using no more fresh water in 2060 than was used in 2012, while supporting Oklahoma's continued growth and prosperity. No state has ever before set such an ambitious goal for water efficiency, conservation, recycling and reuse. Achieving the Water for 2060 goal will not happen without significant, intentional, and collaborative action by key stakeholders in the water community. Many public water suppliers have found that non-potable water reuse has a role in reducing fresh water use, but also has significant limitations due to the seasonality of irrigation-dominated non-potable uses prevalent in our communities.

To explore the possibility of potable reuse, the Oklahoma Legislature also passed State Senate Bill 1043, in 2012, which created the Water Reuse Workgroup. Through the Oklahoma Department of Environmental Quality (ODEQ), it tasked the workgroup to create both Technology and Water Quality Standards subcommittees to develop sound and scientifically defensible public policy for reuse. Concurrent to the work of these subcommittees over the past several years, there has been a rapid acceleration in the level of interest and planning among Oklahoma water providers in using treated municipal wastewater to augment potable water supplies. As an example, to meet growing demands, Norman’s 2060 Strategic Water Supply Plan, adopted in 2014, calls for augmenting Lake Thunderbird to increase the lake’s reliable yield. Similarly, Edmond’s longer-term Water and Wastewater Master Plan includes augmenting Arcadia Lake with treated municipal wastewater to bolster surface water supplies. And recently, Oklahoma City announced that it is investigating similar options for augmenting Lake Hefner source water.

There are significant regulatory challenges associated with implementing these projects, including the development of appropriate discharge permitting strategies to ensure that a level of water quality is maintained to protect the health of both human and aquatic ecosystems, as well as other beneficial uses of these public water supplies. Additionally, certain public water supplies in Oklahoma are given extra protection in the Oklahoma Water Quality Standards (OWQS; OAC 785:45). These reservoirs and their watersheds are classified as Sensitive Water Supplies (SWS) in Oklahoma’s antidegradation policy [OAC 785:45-5-25(c)(4)], and carry prohibitions on new and existing point source discharges and pollutant loadings. However, since the creation of the SWS antidegradation classification in the late 1980’s, wastewater treatment technologies have advanced tremendously, and the demographics and supply needs of Oklahoma municipalities are different. The creation of an alternative reuse classification for SWS reservoirs provides a regulatory pathway to maintain water quality and protect public and aquatic ecosystem health, while allowing communities to implement supply augmentation projects and the state to take significant steps toward achieving its Water for 2060 goals.

What are Sensitive Water Supplies?
The SWS is a Tier 2 classification in the OWQS antidegradation policy that specifically gives special protection to certain public water supply reservoirs and their watersheds (Figure 1). These water supplies generally possess a watershed smaller than 100 square miles, and are located throughout the state. Additionally, they vary in size, including total surface acres and volume. At normal pool, the smallest is Tecumseh Reservoir in central Oklahoma, which is 127 surface acres, has a storage capacity of 1,118 acre feet, and a mean depth of less than 9 feet. Conversely, located in southeastern Oklahoma, Broken Bow Reservoir is the largest, with a storage capacity of 918,000 acre feet (mean depth 65 feet) and a total size of 14,200 surface
acres. Less than one-quarter of the eighty-one SWS lakes have a normal pool storage capacity greater than 23,000 acre feet, and over half are less than 500 surface acres. Though never large, total watershed size is also variable across SWS lakes.

As stated above, the SWS reservoirs by classification are provided additional protection in the OWQS [OAC 785:45-5-25(c)(4)(B)]. There is a prohibition against new loading of any pollutant from a point source discharge existing as of June 11, 1989, or new point sources discharges, after June 11, 1989, that lower existing water quality. However, the “permitting authority” may allow new point sources or increased loads, if the “discharger demonstrates to the satisfaction of the permitting authority that a new point source discharge or increased load from an existing point source discharge will result in maintaining or improving the water quality of both the direct receiving water and any downstream waterbodies designated SWS”. Additional protection is also provided under the public and private water supply (PPWS) beneficial use [OAC 785:45-5-10(7)]. To protect certain public water supplies, including SWS lakes, a criterion of 10 micrograms per liter exists for chlorophyll-a, as a long term average concentration at a depth of 0.5 meters below the surface.

Figure 1. Oklahoma SWS Lakes

Proposed Creation of New SWS-Reuse Antidegradation Classification

With the concurrence of the Water Quality Standards Subcommittee of the Water Reuse Workgroup, the OWRB proposes certain finalized draft revisions to both the OWQS (OAC 785:45) and the OWQS implementation rules (OAC 785:46). The proposed rule revisions specifically provide an optional antidegradation classification for SWS lakes. As stated in the previous section, the SWS reservoirs are provided additional protection under the OWQS antidegradation policy. While continuing to provide some additional protections, the new classification, SWS-Reuse (SWS-R), provides the framework to allow new discharges under
particular circumstances. The proposed rule change is integrated into the following explanation of the rule but is also available in Attachment A.

The proposed new SWS-R classification is defined as “waterbodies classified as sensitive public and private water supplies that may be augmented with reclaimed municipal water for the purpose of indirect potable reuse”. The lakes will continue to be “identified in Appendix A” of the OWQS and maintain the general characteristics of SWS reservoirs, as “waters currently used as water supply reservoirs, that generally possess a watershed of less than approximately 100 square miles, or as otherwise designated by the Board” [Proposed OAC 785:45-5-25(c)(8)(A)]. Similar to SWS lakes, the new rule prohibits new point source discharges or increased loading, “except as outlined in 8(C)” of the new rule [Proposed OAC 785:45-5-25(c)(8)(B)]. Also, the section of the PPWS beneficial use which creates a chlorophyll-a numeric criterion of 10 micrograms per liter for SWS waterbodies [OAC 785:45-5-10(7)] will be amended to include SWS-R waterbodies.

In section 8(C) of the new rule, a variety of provisions are created to protect SWS-R lakes [Proposed OAC 785:45-5-25(c)(8)(C)]. The general preamble to the 8(C) requires new discharges and loads to “achieve a minimum level of effluent quality that is attainable using demonstrated treatment technologies or other alternatives” and provides a link to the “Approaches for required technology-based limitations and or other alternatives” in the OWRB implementation rules [Proposed OAC 785:46-13-4(e)]. The section goes on to outline four specific requirements for the permitted discharges.

1. “The waterbody’s assimilative capacity for all applicable narrative and numeric criteria shall be determined by the discharger. If assimilative capacity exists for any applicable narrative or numeric criteria, the discharger shall document what portion, if any, of the assimilative capacity is reasonable to maintain. If proposed that it is not reasonable to maintain any, or a portion, of the assimilative capacity, a report consistent with all 40 CFR 131.12(a)(2) requirements describing the available assimilative capacity and providing justification for consuming all or a portion of the assimilative capacity shall be submitted by the discharger to the State for review. The State may approve both the determination of assimilative capacity and the proposed consumption of any, or all, of the assimilative capacity if it is found to be necessary based on the aforementioned report and consistent with the requirements described in 40 CFR 131.12(a)(2),” [Proposed OAC 785:45-5-25(c)(8)(C)(i)] The SWS waterbodies are given tier 2 protection by Oklahoma’s antidegradation policy, which protects existing water quality that is above that protected by designated beneficial uses. Because of this additional protection, there is an assumption that the waterbody has assimilative capacity for a variety of constituents (e.g., dissolved solids or some priority pollutant) above that meant to protect designated beneficial uses (Figure 2). Therefore, because new or increased loadings from municipal wastewater discharges may consume a portion of this assimilative capacity, it is important that a consistent and deliberative approach occur, which ensures that:

- The assimilative capacity is documented;
- An important social or economic development needs accommodation;
- After an analysis of alternatives, the consumption of a portion or all of the assimilative capacity may be determined necessary and permitted by a regulatory authority; and,
- Intergovernmental coordination and public participation occur consistent with Oklahoma’s Continuing Planning Process.
2. “All existing and designated beneficial uses of the receiving waterbody and downstream waterbodies shall be maintained.” [Proposed OAC 785:45-5-25(c)(8)(C)(ii)] This provision reiterates the need to maintain all existing and designated beneficial uses both in the lake and downstream.

3. “The discharge shall not impair human health even during drought of record conditions.” [Proposed OAC 785:45-5-25(c)(8)(C)(iii)] This provision provides additional human health protection during even the most critical of situations, when storage and dilution capacity of the reservoir are lowest.

4. “SWS-R waterbodies, with permitted discharge, shall be technically evaluated by permitted parties at least once every five years to determine the attainment or nonattainment of beneficial uses. Technical evaluation reports, including all data and information necessary to allow independent analysis, shall be submitted to the permitting authority for review. If the report documents nonattainment of a beneficial use(s) resulting from the discharge, the permitting authority shall consider actions including, but not limited to, additional permit requirements, cessation of the discharge, and a recommendation to OWRB to revoke the SWS-R waterbody classification.” [Proposed OAC 785:45-5-25(c)(8)(C)(iv)] This provision provides for a mandated periodic evaluation and assessment of the SWS-R waterbody. It ensures that the regulatory process is protecting water quality and provides remedies when it is not.

Figure 2. Theoretical Model of Assimilative Capacity in Receiving Waters

Finally, other revisions are necessary to accommodate the inclusion of SWS-R into the OWQS (Attachment B). These include additional revisions to OAC 785:45 (aka, Chapter 45), but also to OAC 785:46-13 (aka, Chapter 46), which contain the implementation rules for the antidegradation policy. Some of the changes to Chapter 46 are in this proposed revision, while more substantive revisions will be presented during the 2016-2017 interim revision. These new rules will be developed in coordination with the ODEQ’s rules for indirect potable reuse.
Attachment A. Proposed Language for SWS-R Antidegradation Classification

785:45-5-25. Implementation Policies for the Antidegradation Policy Statement
(c) The following limitations for additional protection apply to various waters of the state:

(8) Sensitive Public and Private Water Supplies with Reuse (SWS-R).
   (A) Waters designated "SWS-R" are those waters of the state which constitute sensitive public and private water supplies that may be augmented with reclaimed municipal water for the purpose of indirect potable reuse (IPR). SWS-R waterbodies are identified in Appendix A of this Chapter. These are waters currently used as water supply reservoirs, that generally possess a watershed of less than approximately 100 square miles, or as otherwise designated by the Board.
   (B) New point source discharges of any pollutant after June 11, 1989, and increased load of any specified pollutant from any point source discharge existing as of June 11, 1989, shall be prohibited in any waterbody or watershed designated in Appendix A of this Chapter with the limitation "SWS-R" except as outlined in 8(C) below.
   (C) New point source municipal wastewater discharges or increased loading from existing point source municipal wastewater discharges to a SWS-R waterbody or watershed shall achieve a minimum level of effluent quality that is attainable using demonstrated treatment technologies or other alternatives. Approaches for required technology-based limitations and or other alternatives are outlined in 785:46-13-4(e). A discharge to a SWS-R waterbody may be permitted provided:
      (i) The waterbody's assimilative capacity for all applicable narrative and numeric criteria shall be determined by the discharger;
      (ii) If assimilative capacity exists for any applicable narrative or numeric criteria, the discharger shall document what portion, if any, of the assimilative capacity is reasonable to maintain. If proposed that it is not reasonable to maintain any, or a portion, of the assimilative capacity, a report consistent with all 40 CFR 131.12(a)(2) requirements describing the available assimilative capacity and providing justification for consuming all or a portion of the assimilative capacity shall be submitted by the discharger to the State for review;
      (iii) The State may approve both the determination of assimilative capacity and the proposed consumption of any, or all, of the assimilative capacity only if it is found to be necessary based on the aforementioned report and consistent with the requirements described in 40 CFR 131.12(a)(2);
      (iv) All existing and designated beneficial uses of the receiving waterbody and downstream waterbodies shall be maintained; and
      (v) The discharge shall not impair human health even during drought of record conditions.
   (D) SWS-R waterbodies, with permitted discharge, shall be technically evaluated by permitted parties at least once every five years to determine the attainment or nonattainment of beneficial uses. Technical evaluation reports, including all data and information necessary to allow independent analysis, shall be submitted to the permitting authority for review. If the report documents nonattainment of a beneficial use(s) resulting from the discharge, the permitting authority shall consider actions including, but not limited to, additional permit requirements, cessation of the discharge, and or a recommendation to OWRB to revoke the SWS-R waterbody classification.
Attachment B. Other Proposed Accompanying Language Revisions for SWS-R Antidegradation Classification

TITLE 785. OKLAHOMA WATER RESOURCES BOARD
CHAPTER 45. OKLAHOMA'S WATER QUALITY STANDARDS
785:45-1-2. Definitions

"Existing point source discharge(s)" means, for purposes of 785:45-5-25, point source discharges other than stormwater which were/are in existence when the ORW, HQW, or SWS, or SWS-R designation was/is assigned to the water(s) which receive(s) the discharge. The load from a point source discharge which is subject to the no increase limitation shall be based on the permitted mass loadings and concentrations, as appropriate, in the discharge permit effective when the limitation was assigned. Publicly owned treatment works may use design flow, mass loadings or concentration as appropriate if those flows, loadings or concentrations were approved as a portion of Oklahoma’s Water Quality Management Plan prior to the application of the ORW, HQW, or SWS limitation.

"SWS" means Sensitive Public and Private Water Supply. "SWS-R" means waterbodies classified as sensitive public and private water supplies that may be augmented with reclaimed municipal water for the purpose of indirect potable reuse.

SUBCHAPTER 3. ANTIDEGRADATION REQUIREMENTS
785:45-3-2. Applications of antidegradation policy
(c) Application to Sensitive Public and Private Water Supplies (SWS) and SWS-R. It is recognized that certain public and private water supplies possess conditions that make them more susceptible to pollution events and require additional protection. These sensitive water supplies shall be maintained and protected.

SUBCHAPTER 5. SURFACE WATER QUALITY STANDARDS
PART 3. BENEFICIAL USES AND CRITERIA TO PROTECT USES
785:45-5-10. Public and private water supplies
(7) Chlorophyll-a numerical criterion for certain waters. The long term average concentration of chlorophyll-a at a depth of 0.5 meters below the surface shall not exceed 0.010 milligrams per liter in Wister Lake, Tenkiller Ferry Reservoir, nor any waterbody designated SWS or SWS-R in Appendix A of this Chapter. Wherever such criterion is exceeded, numerical phosphorus or nitrogen criteria or both may be promulgated.

PART 5. SPECIAL PROVISIONS
785:45-5-25. Implementation Policies for the Antidegradation Policy Statement
(a) The following provisions set forth exceptions to the limitations stated in 785:45-5-25(c) for additional protection of certain waters of the state:
(2) The limitations for additional protection of Appendix B Waters (785:45-5-25(c)(2)), High Quality Waters (785:45-5-25(c)(3)), and Sensitive Public and Private Water Supplies (785:45-5-25(c)(4)), and SWS-R waterbodies (785:45-5-25(C)(8)) shall apply to discharges from all point sources except point source discharges of stormwater.
(6) Non-Point Source Discharges or Runoff. Best management practices for control of non-point source discharges or runoff should be implemented in watersheds of waterbodies designated "ORW", "HQW", or "SWS", or “SWS-R” in Appendix A of this Chapter and/or located within areas listed in Appendix B provided however that development of conservation plans shall be required in sub-watersheds where discharges or runoff from non-point sources are identified as causing, or significantly contributing to, degradation in a waterbody designated "ORW".
APPENDIX A. DESIGNATED BENEFICIAL USES OF SURFACE WATERS
(c) Limitations for Additional Protection.
(1) Limitations for additional protection are described in 785:45-5-25.
(2) Waterbodies that are subject to limitations for additional protection in 785:45-5-25 are identified by the designation of any of the following codes in the "Limitations" column to the right of the waterbody's name:
(A) "ORW" - indicates waters designated Outstanding Resource Waters;
(B) "HQW" - indicates waters designated High Quality Waters; and
(C) "SWS" - indicates waters designated Sensitive Public and Private Water Supplies.
(D) "SWS-R" means waterbodies classified as sensitive public and private water supplies that may be augmented with reclaimed municipal water for the purpose of indirect potable reuse.

APPENDIX E. REQUIREMENTS FOR DEVELOPMENT OF SITE-SPECIFIC CRITERIA FOR CERTAIN PARAMETERS
G. Site-Specific Criteria for Parameters Other Than Metals
The purpose of site-specific criteria investigations may not necessarily be intended to prevent toxicity as a result of the substance of concern. Various substances may produce various types of adverse impacts in the environment. For example, minerals may produce a toxic response due to ionic imbalance while nutrients may produce various impacts depending upon algal response to various conditions within the system. Examples of such systems include those that where there may be nitrogen, phosphorus or light limitations. Resulting site-specific criteria may involve seasonal, spatial or other limitations as well as specific numeric limitations.
“Waterbody-specific” criteria, such as certain nutrients in Sensitive Water Supplies waters designated SWS or SWS-R, or segment-specific metals, may not have limitations on its applicability. Rather, it may be used a substitute for other applicable statewide criteria.

TITLE 785. OKLAHOMA WATER RESOURCES BOARD
CHAPTER 46. IMPLEMENTATION OF OKLAHOMA'S WATER QUALITY STANDARDS

SUBCHAPTER 1. GENERAL PROVISIONS
785:46-1-2. Definitions
p.3
"Increased load" means the mass of pollutant discharged which is greater than the permitted mass loadings and concentrations, as appropriate, in the discharge permit effective when the SWS, SWS-R, HQW, or ORW beneficial use limitation was assigned.
p.4
"SWS" means Sensitive Public and Private Water Supplies
"SWS-R" means waterbodies classified as sensitive public and private water supplies that may be augmented with reclaimed municipal water for the purpose of indirect potable reuse.

SUBCHAPTER 13. IMPLEMENTATION OF ANTIDEGRADATION POLICY
785:46-13-1. Applicability and scope
(a) The rules in this Subchapter provide a framework for implementing the antidegradation policy stated in OAC 785:45-3-2 for all waters of the state. This policy and framework includes three tiers, or levels, of protection.
(b) The three tiers of protection are as follows:
(1) Tier 1. Attainment or maintenance of an existing or designated beneficial use.
(3) Tier 3. No degradation of water quality allowed in Outstanding Resource Waters.
In addition to the three tiers of protection, this Subchapter provides rules to implement the protection of waters in areas listed in Appendix B of OAC 785:45. Although Appendix B areas are not mentioned in OAC 785:45-3-2, the framework for protection of Appendix B areas is similar to the implementation framework for the antidegradation policy.

In circumstances where more than one beneficial use limitation exists for a waterbody, the most protective limitation shall apply. For example, all antidegradation policy implementation rules applicable to Tier 1 waterbodies shall be applicable also to Tier 2 and Tier 3 waterbodies or areas, and implementation rules applicable to Tier 2 waterbodies shall be applicable also to Tier 3 waterbodies.

Publicly owned treatment works may use design flow, mass loadings or concentration, as appropriate, to calculate compliance with the increased loading requirements of this section if those flows, loadings or concentrations were approved by the Oklahoma Department of Environmental Quality as a portion of Oklahoma's Water Quality Management Plan prior to the application of the ORW, HQW, SWS, or SWS-R limitation.

785:46-13-3. Tier 1 protection; attainment or maintenance of an existing or designated beneficial use

(c) Prohibition against degradation of improved waters. As the quality of any waters of the state improves, no degradation of such improved waters shall be allowed.


(a) General rules for High Quality Waters. New point source discharges of any pollutant after June 11, 1989, and increased load or concentration of any specified pollutant from any point source discharge existing as of June 11, 1989, shall be prohibited in any waterbody or watershed designated in Appendix A of OAC 785:45 with the limitation "HQW". Any discharge of any pollutant to a waterbody designated "HQW" which would, if it occurred, lower existing water quality shall be prohibited. Provided however, new point source discharges or increased load or concentration of any specified pollutant from a discharge existing as of June 11, 1989, may be approved by the permitting authority in circumstances where the discharger demonstrates to the satisfaction of the permitting authority that such new discharge or increased load or concentration would result in maintaining or improving the level of water quality which exceeds that necessary to support recreation and propagation of fishes, shellfishes, and wildlife in the receiving water.

(b) General rules for Sensitive Public and Private Water Supplies. New point source discharges of any pollutant after June 11, 1989, and increased load of any specified pollutant from any point source discharge existing as of June 11, 1989, shall be prohibited in any waterbody or watershed designated in Appendix A of OAC 785:45 with the limitation "SWS". Any discharge of any pollutant to a waterbody designated "SWS" which would, if it occurred, lower existing water quality shall be prohibited. Provided however, new point source discharges or increased load of any specified pollutant from a discharge existing as of June 11, 1989, may be approved by the permitting authority in circumstances where the discharger demonstrates to the satisfaction of the permitting authority that such new discharge or increased load will result in maintaining or improving the water quality in both the direct receiving water, if designated SWS, and any downstream waterbodies designated SWS.

(c) Stormwater discharges. Regardless of subsections (a) and (b) of this Section, point source discharges of stormwater to waterbodies and watersheds designated "HQW", "SWS-R", and "SWS" may be approved by the permitting authority.

(d) Nonpoint source discharges or runoff. Best management practices for control of nonpoint source discharges or runoff should be implemented in watersheds of waterbodies designated "HQW", "SWS-R", or "SWS" in Appendix A of OAC 785:45.

(e) RESERVED FOR IMPLEMENTATION PROVISION RELATED TO 785:45-5-25(8)