

ANTIDEGRADATION IMPLEMENTATION METHODS

7.1 DEFINITIONS

Activities: proposed new or expanded NPDES permits, 2) proposed new or modified state permits, 3) CWA § 404 dredge and fill permits, 4) any activity requiring a CWA § 401 certification, or 5) any activity, or multiple activities taken together, that may threaten the most sensitive use or result in a lowering of a waterbody's total assimilative capacity plus a margin of safety by $\geq 10\%$.

Alternatives Analysis: A structured evaluation of the practicability of less- and non-degrading alternatives to an activity likely to cause lowering of water quality.

Antidegradation: The implementation of a policy and procedure approved by the Environmental Protection Agency and the Arkansas Pollution Control and Ecology Commission that outlines how the Arkansas Department of Environmental Quality will determine, on a case-by-case basis, whether and to what extent, existing water quality may be degraded in a Water of the State. The Antidegradation Policy refers to binding regulatory language or statute, while the Antidegradation Implementation is the process by which activities are reviewed.

Assimilative Capacity: Ability of body of water to receive pollutants without exceeding the water quality criteria and including a margin of safety or without causing harm or damage to aquatic life or human health or other designated uses.

Baseline Water Quality (BWQ): The BWQ shall be representative of the water quality at or immediately upstream from the activity under critical flow conditions. Once established, BWQ is a fixed quantity expressed as a concentration. For waters receiving pollutants from a point source (where full design capacity has not been reached), the BWQ shall include the levels of pollutants already permitted to be discharged at maximum design flow. BWQ are conditions present on or before June 1, 1987 based on mean ecoregion values or the collection of that represent upstream water chemistry upstream or at the discharge point over the last five (5) years during periods of critical flows, whichever is more protective.

Beneficial Uses: All existing and designated uses of waters of the State. “Existing uses are defined in APC&EC Reg. 2.106. “Designated uses” as are defined in APC&EC Regulation No. 2.106 and 2.302.

Best Management Practice (BMP): a practice, or combination of practices, that is determined to be an effective and practicable (including technological, economic, and institutional considerations) means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water.

Clean Water Act (CWA): The federal Water Pollution Control Act, as amended 33 U.S.C. §§ 1251 *et. seq.*

Critical Flow Conditions: The point in time when the beneficial uses water quality or the effects of pollution within a water of the State are most susceptible to anthropogenic and/or hydrologic

effects; generally, but not necessarily, when a stream is at or below its Q7-10 flow or harmonic mean (APC&EC Regulation 2.106 “critical flows”). A lake's critical condition shall be determined on a case-by-case basis, but would normally be when the surface water is at or below its ordinary or base level.

Cumulative Degradation: The reduction of a waterbody’s assimilative capacity from all activities through time and space.

Degradation: An increase in the concentration or load of the pollutants of concern within a surface water measured on a parameter-by-parameter basis.

Department: Arkansas Department of Environmental Quality (ADEQ or Department).

Designated Use: A beneficial use designated effor waters of the State as defined in APC&EC Regulation No. 2., whether or not it is being attained.

Effluent: Water that is not reused after flowing out of any wastewater treatment facility or other works used for the purpose of treating, stabilizing, or holding wastes.

Exceptional High Quality Water (EHQW): All waterbodies that are currently used for domestic water supply will be considered Tier 2.5.

Existing Activity: NPDES permits, state permits, any activity having a CWA § 401 certification, or 5) any activity that threatens the most sensitive use or result in significant degradation, at the time the baseline water quality is determined.

Existing Use: Those uses listed in Section 303(c)(2) of the Clean Water Act, 33 U.S.C. § 1313(c)(2) (i.e., public water supplies, propagation of fish and wildlife, recreational uses, agricultural and industrial water supplies, and navigation), which were actually attained in the waterbody on or after November 28, 1975, whether or not they are included in the water quality standards.

Expanding Wastewater: An increased volume of purged water or increased concentration or mass of pollutants.

High Quality Water (HQW): All other waters not defined as Tier 1, 2.5, or 3. ~~and are exceeding water quality criteria.~~

Hybrid Approach: Consists of a combination of waterbody-by-waterbody and parameter-by-parameter approaches to classify waterbody tiers.

Margin of Safety: A 20 percent buffer added to the total assimilative capacity to conserve water quality and ensure that significant degradation resulting from a regulated activity does not exceed a receiving waterbody’s total assimilative capacity.

Non-Degrading Alternative: An alternative to a proposed activity that would not result in significant lowering of water quality.

Non-Significant Lowering of Water Quality: A reduction of less than 10 percent of the waterbody's total assimilative capacity including a 20 percent margin of safety for any pollutant as a result of any single discharge/activity or as a result of all discharges/activities combined after baseline water quality has been determined. ~~Events or activities causing non-significant lowering of water quality are not required to undergo a Tier 2 review.~~

Non-Point Source: Pollution that originates from ~~many~~ diffuse sources that are not point sources. ~~and cannot be traced back to a single activity.~~

Outstanding Resource Waters (ORW): Waters designated in APC&EC Regulation No. 2. 203, ~~including as~~ Extraordinary Resource Waters, Ecologically Sensitive Waterbodies, and Natural and Scenic Waterways. These high quality waters constitute an outstanding state resource, with significant aesthetic, recreational, or scientific value.

Parameter-by-Parameter Basis: The review of the pollutants in a waterbody by assessing the level of each pollutant of concern, as opposed to assessing the overall condition of a waterbody, for the purpose of determining the level of antidegradation review applicable to the waterbody.

Pollutant of Concern (POC): Pollutants generated by activities that affect beneficial use(s) in waters of the State. POCs include pollutants that create conditions unfavorable to beneficial uses in the waterbody receiving pollutants generated by activities or proposed to receive pollutants generated by activities. (For example, where pH, temperature, and dissolved oxygen are in noncompliance with applicable numeric criteria or if nonpoint source activities have led to violations of turbidity criteria.)

Pollution: Contamination or other alteration of the physical, chemical, or biological properties of any waters of the State, or such discharge of any liquid, gaseous, or solid substance in any waters of the State as will, or is likely to, render the waters harmful, detrimental, or injurious to public health, safety, or welfare; to domestic, commercial, industrial, agricultural, recreational, aquatic life or other beneficial uses

Point Source: Permitted discharge activity.

Practicable Alternative: Wastewater treatment or control alternative determined to be the least degrading, ~~and most~~ economically viable ~~efficient,~~ and socially beneficial, ~~and affordable~~ alternative or otherwise defined by 40 CFR 131.3 (n).

Q7-10: A flow volume equal to or less than the lowest mean discharge during 7 consecutive days of a year which, on the average, occurs once every 10 years.

Significant Lowering of Water Quality: A reduction by 10 percent or more of the waterbody's total assimilative capacity including a 20 percent margin of safety for any pollutant as a result of any single activity or as a result of all /activities combined after baseline water quality was

determined. Events or activities causing significant degradation of water quality are required to undergo a Tier 2 review.

Social and Economic Importance: The social and economic benefits to the community that will occur from new or increased discharge/activity or waste load.

Tier: Level of antidegradation review assigned to waterbodies. Tier 1 is the lowest level required for protection of existing uses, Tier 2 are waterbodies ~~with that~~ water quality ~~that~~ exceeds ~~that of the~~ water quality standards, Tier 2.5 are waterbodies that are currently used for domestic water supply, and Tier 3 are identified as national and state resource waters. See definitions for ~~EUW~~, HQW, EHQB, and ORW.

Temporary Lowering of Water Quality: Lowering of water quality that is non-permanent and of short duration, and the effects can be regarded as insignificant following a review of 1) short length of time during which water quality will be lowered, 2) percent change in ambient conditions during critical conditions, 3) parameters affected, 4) likelihood for long term water quality benefits to the waterbody (i.e., as may result from dredging of contaminated sediments), 5) degree to which achieving the applicable water quality standards during the proposed activity may be at risk, and 6) potential for any residual long-term influences on existing uses or factors outlined in Section ~~7.5.3~~ of this document.

Total Assimilative Capacity: The ability of a waterbody to naturally attenuate a substance without causing a violation of water quality criteria or impairing beneficial uses. It is the difference between the best possible baseline water quality at low critical flow and water quality criteria. The baseline water quality must take into consideration all pollutant contributions from all sources.

Water Quality Criteria (WQC): Chemical, physical, and biological attributes of waterbodies that are necessary to protect beneficial ~~water~~ uses or the water quality standards, which are expressed as the maximum allowable pollutant concentrations, narrative criteria, or other conditions necessary for a waterbody to fully support a beneficial use.

Water Quality Standards (WQS): Covering water classification, beneficial uses (40 CFR 131.10), general and specific water quality criteria (40 CFR 131.11), Antidegradation, and general policies (40 CFR 131.12) and conditions for Waters of the State.

Waterbody-by-Waterbody Approach: The review of the pollutants in a waterbody by assessing the overall or combined levels of the pollutant of concern as opposed to assessing the level of each pollutant of concern in a waterbody for the purpose of determining the level of review applicable to the waterbody.

Waters of the State: All streams, lakes, marshes, ponds, watercourses, waterways, wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface and underground, natural or artificial, public or private, which are contained within, flow through, or border upon this state or any portion of the state. A.C.A. § 8-4-102 (2017).

7.2 INTRODUCTION

Arkansas's Antidegradation Policy, herein "Policy", is set forth in Chapter 2 of the APC&EC Regulation No. 2. States are required to develop and adopt an antidegradation policy and methods for implementing such policy (40 CFR § 131.12). This document shall serve as the implementation methodology for the antidegradation policy and describes how activities are to be reviewed.

Antidegradation Review must be documented for each water quality activity, including the justification for either not conducting a review or completing an in-depth review.

The Policy protects water quality and beneficial uses from degradation. However, ~~The~~ the Policy must also provide for alternatives analysis and methods for allowing exceptions in certain situations (40 CFR § 131.12(a)(2)). Lowering of water quality (but not below the quality necessary to maintain and protect existing uses and meet all water quality standards) is allowed only after a systematic decision-making process considering many factors. These factors include the classification of the waterbody, consideration of non-degrading and less-degrading alternatives to the proposed activity, and considering ~~comparison of the~~ economic and social ~~development~~ benefits analyses associated with ~~of the~~ lowering of water quality as proposed by the activity. In addition, the antidegradation policy requires the involvement of the public through direct notice and through coordination with other government agencies.

7.3 TIER PROTECTION LEVELS

An Antidegradation Policy provides a means for maintaining and protecting surface water quality by requiring all activities with the potential to affect baseline water quality to undergo review and comment prior to any agency decision to approve or deny the activity. In compliance with 40 CFR § 131.12, implementation procedures for Arkansas's Policy identifies levels of antidegradation review (tiers), determination of baseline water quality (BWQ), assessing and determining the extent of acceptable lowering of water quality, and the identification of less-degrading or non-degrading alternatives. A waterbody's tier identification is the first step in the process and may be completed on a parameter-by-parameter or waterbody-by-waterbody approach. Arkansas is implementing a hybrid approach in that Tier 1, Tier 2, and Tier 2.5 reviews will be completed parameter-by-parameter and Tier 3 reviews will be waterbody-by-waterbody (Figure 1).

Tier 1: Existing Use Waters (EUW) the basic protection afforded to all waterbodies regardless of current water quality, which is that existing uses will be maintained and protected. EUW ~~waterbodies include;~~ canals/ditches, storm water control structures, and structures purposefully created for effluent conveyance with an existing use attained on or after November 28, 1975, whether or not they are included in the water quality standards.

Tier 2: High Quality Waters (HQW) applies to all other waters of the State for protection of baseline water quality that is better than the water quality criteria and the cumulative activities would result in non-significant degradation which would not lower quality. However, an activity that would result in or contribute to ~~proposes~~ significant lowering of water quality would require a demonstration that the lowering of water quality is

necessary and Tier 1 protection is ensured. Tier 2 is the default protection for all waters, with the exception of Tier 1, Tier 2.5, and Tier 3 waters.

Tier 2.5: Exceptional High Quality Water (EHQW) applies to all waterbodies that are currently used for domestic water supply as determined by the Arkansas Department of Health and Arkansas Natural Resource Commission. Activities that lower water quality of Tier 2.5 streamswaters may occur up to 10% of the waterbody's total assimilative capacity (including a 20% margin of safety) for each parameter. Once 10% of a waterbody's total assimilative capacity including the margin of safety is reached for a parameter, proposed new or expanding activities may proceed, but with no net increase of parameter load in excess of 10% of the combined assimilative capacity and margin of safety.

Tier 3: Outstanding Resource Waters (ORW) applies to waterbodies listed as an Outstanding Resource Water (ERW, ESW, and NSW) in APC&EC Regulation No. 2.203. Tier 3 review is required for those waters encompassed by APC&EC Reg. 2.203 and 40 CFR § 131.12(a)(3).

The first step in the Antidegradation Review process is determining and documenting which Tier applies to the receiving waterbody.

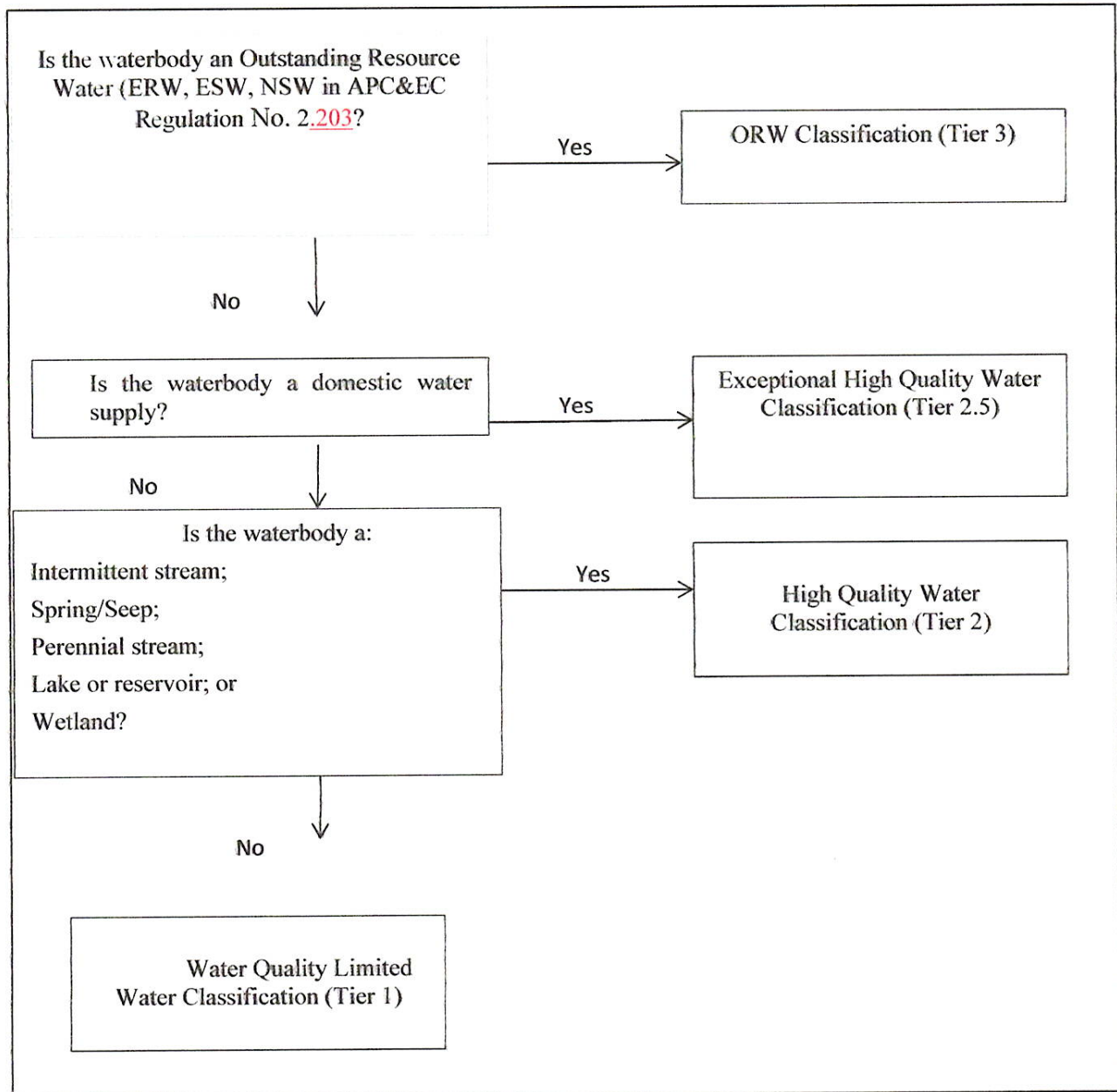


Figure 1. Antidegradation waterbody tier determination diagram.

According to APC&EC Reg. 2.204, in those cases where potential water quality impairment associated with a thermal discharge is involved, the antidegradation policy and implementing method shall be consistent with Section 316 of the CWA, 33 U.S.C. § 1326.

7.4 TIER PROTECTION LEVELS AND ANTIDEGRADATION EVALUATION

A) Tier 1- Existing Use Waters (EUW) Evaluation

Review of Tier 1 waters will be for ~~those include~~ canals/ditches, storm water control structures, and structures purposefully created for effluent conveyance with an existing use attained on or after November 28, 1975, whether or not they are included in the water quality standards. For Tier 1 waters, the antidegradation policy is implemented through the state's NPDES Permit Issuance Process (See Section 7.5). New or expanding activities are not allowed to discharge pollutants that may cause or contribute to impairment of a designated use, violation of water quality criteria, or further contribute to a § 303(d) listed water.

Tier 1 review allows activities to occur according to relevant water quality standards without an alternatives analysis or social and economic analyses. Other requirements for the development of appropriate effluent limits are still applicable.

B) Tier 2 High Quality Waters (HQW) Evaluation

Review of Tier 2 waters will be for all other waters of the State (not identified as Tier 2.5 or Tier 3 waters;) such as 1) intermittent streams, 2) springs/seeps, 3) perennial streams, 4) lakes and reservoirs, and 5) wetlands. By definition, at the High Quality Water protection level, baseline water quality (BWQ) is better than the minimum WQS for one or more water quality parameters. Tier 2 waters are those that meet water quality criteria for a parameter and use ~~of~~ less than (<) 10% of the total assimilative capacity of cumulative pollutant loads with a 20 % margin of safety. This water quality, which includes all existing discharges and activities which, would still allow the waterbody to remain high quality. A significant increase (> 10% of total assimilative capacity combined with a margin of safety) in cumulative pollutant loading, which includes all existing discharges and activities, shall require the applicant to demonstrate that the lowering of water quality is necessary by submitting documentation that demonstrates:

- 1) Lowering water quality is necessary to accommodate important economic or social development in the area where the water is located;
- 2) The highest statutory and regulatory requirements for all new and existing point sources are achieved;
- 3) All cost-effective and reasonable best management practices (BMPs) for nonpoint source control are implemented; and
- 4) Tier 1 protection is ensured such that all water quality standards are met and all existing uses are protected.

Decisions regarding significant lowering of water quality of Tier 2 protection levels will only be made after steps 1-4 are submitted and verified and after the intergovernmental coordination and public participation provisions have been satisfied.

The Antidegradation Review of potentially degrading activities is intended to ensure that the lowering of water quality is minimized, that any lowering of water quality is necessary, and that desirable economic and social benefits accrue to the area affected by the lowered water quality.

C) Tier 2.5 Exceptional High Quality Waters (EHQW) Evaluation

Waters currently identified by Arkansas Department of Health or identified as planned uses by the Arkansas Natural Resource Commission as domestic water supplies are considered EHQW. Activities that lower water quality of Tier 2.5 streamswaters may occur up to 10% of the waterbody's assimilative capacity combined with a 20% margin of safety for each parameter. Once 10% of a waterbody's total assimilative capacity plus the margin of is-safety is reached, proposed new or expanding activities may proceed, but with no net increase of parameter load in excess of the assimilative capacity and margin of safety.

D) Tier 3 Outstanding Resource Waters (ORW) Evaluation

ORWs are in APC&EC Regulation No. 2.203 for their outstanding natural or cultural resource value. ~~This ORW waters, such as those waters -are~~ designated as ERW, ESW, or NSW (APC&EC 2017, Appendix A, D). An ORW is Tier 3, regardless of baseline water quality for each parameter. A Tier 3 waterbody's total assimilative capacity is to be maintained in order to protect existing uses. ~~Proposed new or expanding activities may proceed, but with no net increase of parameter load in excess of the assimilative capacity. Activities that result in temporary lowering of water quality are eligible for review.~~

7.5 ACTIVITIES ELIGIBLE FOR ANTIDEGRADATION REVIEW

New or expanding wastewater: Compliance with the antidegradation policy shall be conductedrequired for all new or expanding wastewater discharges into Arkansas surface waters that require a permit. Expanding wastewater is defined as increased volume of purged-wastewater or increased concentration or mass of pollutants.

Renewals: NPDES permit renewals of major industrial and municipal facilities without new or expanding wastewater will ~~not~~ be subject to an initial, one-time Antidegradation Review, reporting procedures, provided there are no proposed changes to the facility's effluent which would result in increases in pollutant loadings. However, This one-time antidegradation review of renewal permits for these major facilities will be phased in over a ten-year period, beginning with renewals for major industrial facilities then followed by reviews for the major municipal facilities. However, if impairments degradation over time isare detected from routine monitoring for any permitted facility, regardless of category, then changes in permit limits will be required and those will be subject to -to address subsequent downstream impairmentsAntidegradation Review. If downstream impairments are calculated from discharge monitoring report (DMR) data rather than observed data from a water quality monitoring station, permit limits shall be required and subject to Antidegradation review. If a permittee has a history of permit noncompliance, then permit renewal may be subject to Antidegradation Review.

Thermal Discharge: Regulation 2.204 of the Arkansas antidegradation policy is relevant when water quality impairment is associated with a thermal discharge. The antidegradation policy and implementation method shall be consistent with Section 316 of the CWA. Regulation 2.502 states: Heat shall not be added to any waterbody in excess of the amount that will elevate the natural temperature, outside the mixing zone, by more than 5°F (2.8°C) based upon the monthly average of the maximum daily temperatures measured at mid-depth or three feet (whichever is less) in streams, lakes or reservoirs.

General Permits: In an effort to expedite permit timeliness, antidegradation requirements will be incrementally addressed for all general permits during the renewal process. ~~However, activities covered by general permits may still be subject to an antidegradation review if~~ during the application period, the activity is determined to likely cause significant degradation, the activity shall be required to obtain an individual permit, which shall be subject to Antidegradation Review.

Activities Not Involving a Discharge: Activities permitted through CWA § 401 and 404 will be subject to Antidegradation Review. Compliance with APC&EC Regulation 2.304 (Physical Alteration of Habitat) and 2.405 (Biological Integrity) as well as protection of designated uses must be ensured.

7.6 ANTIDEGRADATION REVIEW PROCEDURE

Implementation of antidegradation applies to all waters of the state regardless of tier classification. In no instance shall the outcome of any degradation determination or antidegradation review authorize water quality impairment. APC&EC Regulation 2.303, 2.306-2.308 outlines necessary procedures for removing designated uses that are not existing if attainment is precluded due to one of six factors (40CFR § 131.10(g)).

The antidegradation review ~~portion~~ should happen early in the application process to ensure that the environmental consequences of any activity that might affect water quality are fully assessed. For new and expanding NPDES permits or applicable permit renewals, the antidegradation review will be during preliminary limit calculations. Entities may forgo this step and move directly to an alternatives analysis, economic analysis, and social development analysis ~~or economic justification~~ if it is known or assumed that significant lowering of water quality is likely to occur. ~~from a new or expanding activity.~~ The assessment shall be subject to public participation and interagency governmental coordination. After considering public comments, the non-degrading and less-degrading alternatives, practicable alternatives, costs, and the socio-economic impacts, the permit application may be approved or denied by ADEQ.

Antidegradation reviews are required for: 1) proposed new or expanding NPDES permit discharge; 2) certain NPDES permit renewals; 23) proposed new or modified state permits; 34) any activity requiring a CWA § 401 certification; 45) any activity that may threaten the most sensitive use or 56) any activity that results in significant lowering of water quality. ADEQ shall assure that proposed activities fully protect existing uses and achieve the highest statutory and regulatory requirements (40 CFR § 131.12). In doing so, analysis of alternatives, social and economic analyses, ~~selected practicable alternative, and all cost effective and implementation of all~~

reasonable BMPs must be provided. Determinations issued under these provisions must be made in accordance with the public participation process.

For ~~new and/or expanding covered~~ activities, the review will generally take the following steps as outlined in the permit application instructions:

- Step 1. A) The applicant requests a determination of preliminary effluent limits for those water quality parameters believed to be present in the proposed activity; or
B) The applicant submits an application without determination of preliminary effluent limits; or
C) The applicant is subject to an Effluent Limitation Guideline (ELG).
- Step 2. The preliminary determination of effluent limits will include, if applicable, a finding that the proposed activity or increase in discharge will cause significant lowering of water quality and identify the Tier Protection Level applicable to the receiving stream.
- Step 3. Upon a significant degradation determination, the applicant shall provide ~~an~~ antidegradation review documents and may choose to meet with the Department.
- Step 4. Upon receipt of antidegradation review documents, the Department will promptly cause to be published a Public Notice acknowledging the receipt of the antidegradation review documentation and begin technical review.
- Step 5. Upon completion of the technical review, ADEQ will cause to be published, for a minimum thirty-day comment period, the draft permit, antidegradation review, and Water Quality Management Plan (WQMP).
- Step 6. The Director will evaluate the public interest and may call a public hearing on the draft permit, the antidegradation documents, and WQMP.
- Step 7. Following the public hearing and receipt of public comments, ADEQ will prepare response to comments, final permit, and final WQMP for the Director's decision.
- Step 8. A final permitting decision will be issued and ~~Anyany~~ person with standing may appeal the Director's decision in accordance with Regulation No. 8.

This portion of the chapter outlines the procedure for determining whether or not degradation is allowed in waters of the State from regulated discharges/activities. The antidegradation review procedure is based on the following items. See Section ~~7.11~~ below for Antidegradation Decision Diagram.

- A. The level of protection (i.e., Tier 1, 2, 2.5, or 3) assigned to water receiving the discharge/activity and the pollutant of concern;
- B. Baseline water quality of the receiving water (as defined in section 7.1);

- C. Total Assimilative Capacity with a 20% margin of safety for each applicable pollutant of concern in the receiving water;
- D. The degree of lowering water quality (Significant or insignificant); and
- E. If significant lowering of water quality, provide alternatives methods analysis and social and economic impact analyses of the proposed discharge/activity.

A) Level of Protection

Determination of Tier 1, 2, 2.5, or 3 status can be found in Section 7.3.

B) Baseline Water Quality (BWQ) of the Receiving Water

The BWQ shall be representative of the receiving waterbody's water quality at or immediately upstream from the activity. Once established, BWQ is a fixed quantity expressed as a concentration. For waters receiving pollutants from a point source (where full design capacity has not been reached), the BWQ shall include the levels of pollutants already permitted to be discharged at maximum design flow. BWQ shall be the conditions present on or before June 1, 1987 based on mean ecoregion values or based on the collection of representative upstream water chemistry upstream of or at the proposed discharge over the last five (5) years, whichever is more protective.

C) Total Assimilative Capacity and Margin of Safety

The total assimilative capacity of a waterbody describes the amount of a pollutant that can be added to that waterbody without causing a violation of water quality criteria or impairing a beneficial use. Tier 1 waterbodies ~~iesy's~~ are maintaining existing uses and water quality standards, which assumes no assimilative capacity. A Tier 3 waterbody's total assimilative capacity is to be maintained in order to protect existing uses. Each waterbody has a unique available capacity for each water quality parameter that is derived from BWQ.

In order to determine the remaining assimilative capacity of a waterbody, the total assimilative capacity must be determined for each water quality parameter. ~~each time a new or expanded facility/activity is considered.~~ Baseline water quality must take into consideration all pollutant contributions from natural sources, permitted point sources (100% of allocation), and nonpoint sources. The total available assimilative capacity is the difference between the baseline water quality and the water quality criteria.

Example:

$$\begin{array}{rcl} \text{Baseline water quality} & - & \text{water criteria} = \text{total assimilative capacity} \\ 10\text{mg/L} & - & 3\text{mg/L} = 7\text{ mg/L} \end{array}$$

10 mg/L= baseline water quality;

3 mg/L=water quality criteria;

7 mg/L=total assimilative capacity [*includes contribution of from natural, permitted point sources, and nonpoint sources*].

Additionally, a 20% margin of safety shall be combined with the total assimilative capacity to account for the limited knowledge on which criteria development is grounded and data gaps on impacts due to permitted facilities. The margin of safety conserves water quality and helps ensure that significant degradation resulting from a regulated activity does not exceed a receiving waterbody's total assimilative capacity. The margin of safety in the example above would be 1.4 mg/L. Therefore, 7 mg/L - 1.4 mg/L = 5.6 mg/L (total assimilative capacity combined with the margin of safety).

ADEQ will maintain a waterbody's assimilative capacities with the margin of safety in the Water Quality Management Plan (WQMP) through applicant submitted and ADEQ approved total assimilative capacity calculations or from updates to total maximum daily loads. This will also include previously approved non-significant determinations to allow for future allowable assimilative capacity calculations.

Tier 1 waters have no available assimilative capacity. Tier 3 waters ~~may have retain the total~~ assimilative capacity ~~but and any significant~~ lowering of water quality is precluded. Tier 2 and 2.5 waters Total Assimilative Capacity is finite and allowable assimilative capacity may run out for certain waterbodies and/or water quality parameters.

D) Degradation Determination

Some increase in pollutant loading is allowed for parameters for waterbodies categorized as Tier 2 or Tier 2.5 for the parameter in question. ADEQ or the applicant shall first determine whether or not the proposed new or expanded discharge or other/ applicable activity will result in significant lowering of water quality. Significant lowering of water quality is defined by a 10 percent or greater reduction of a waterbody's total assimilative capacity including a margin of safety for any pollutant. Alternatively, non-significant lowering of water quality is an activity that results in a pollutant reducing a waterbody's total assimilative capacity with a margin of safety by less than 10 percent.

Documentation to support a significant or non-significant lowering of water quality may include, but not be limited to, the percent change in ~~of~~ the pollutant during appropriate critical periods, loading calculations, percent reduction of assimilative capacity and corresponding margin of safety, the nature, persistence, and potential effects of the pollutant, the predicted impacts on aquatic life, potential for bioaccumulative effects, and the degree of confidence in any model input. ~~However, if~~ a non-significant determination is calculated, but potential for bioaccumulation or impacts to aquatic biota may be present, then an antidegradation review may be required.

~~A permit applicant may proceed without calculation of total assimilative capacity and degradation determination if~~ it is assumed that the new or expanding activity/discharge or other applicable activity will result in consumption of ~~less than or equal to~~ 10% or more of the assimilative capacity and corresponding margin of safety. ~~The~~ applicant may proceed with submitting review of baseline water quality, alternatives analysis, and social and -economic impact analyses (Section 7.6(E)).

E) Alternatives Analysis and Economic Analysis and Social Development Analysis

Antidegradation review under Tier 2 and Tier 2.5 for significant lowering of water quality requires documentation that the proposed activity and treatment alternatives and social and- economic impactsanalyses have been evaluated and considered. The applicant may utilize documents such as “*Guidelines for Preparing Economic Analysis*” EPA, March 2016, or others, for guidance in completing the report. All authorities used to support the analyses shall be cited.

1) Alternatives Analysis

An applicant proposing any new or expanded discharge or other applicable activity that ~~would~~ significantly lowers water quality is required to prepare an evaluation of alternatives. The purpose of this evaluation is to determine if reasonable alternative(s) exist to prevent significant lowering of water quality. An Alternatives Analysis are compared to practicability, considers the available technology, and affordability of the controls required to protecting existing uses and to achieving the highest statutory and regulatory requirements.

The analysis should include a description of each alternative in terms of technical and- economic, and-social feasibility. Alternatives to be considered should include but are not limited to:

- 1) A centralized no discharge system;
- 2) Connection to an existing wastewater treatment facility;
- 3) An alternative discharge point;
- 4) Product or raw material substitution;
- 5) Improved operation and maintenance of existing treatment;
- 6) Installation of biological/physical/chemical treatment process that provide higher level of treatment;
- 7) Project relocation;
- 8) Seasonal or controlled discharges to avoid critical water quality periods;
- 7)-and
- 9) Other alternatives; and
- 10) Combinations of alternatives.

ADEQ may require that the applicant analyze additional alternatives if an appropriate range of alternatives were not evaluated. ADEQ staff and the applicant should meet to discuss these and other issues early in the process. The applicant should also document any alternatives that were determined to be impracticable and provide a basis for the conclusion.

If experimental or unproven methods are proposed, ADEQ may request information on previous applications of the method, effectiveness, transferability (if applicable), costs and other information as appropriate. Applications containing proposals for new or experimental methods will be required to append information regarding likely performance results. Such applications may be approved at the Director's discretion with permit conditions included requiring appropriate monitoring to confirm performance results and if, after monitoring for a specified period of time,

the proposed technology does not meet project pollutant control targets, permit conditions that specify when the applicant shall adopt conventional or other pollution control measures that meet state antidegradation requirements.

The evaluation of alternatives shall provide substantive information pertaining to the effectiveness, costs, and environmental impacts of the alternatives. If at least one non-degrading alternative is technically and economically feasible, then the source should pursue that alternative rather than an alternative that results in a lowering of water quality. If the alternatives that are technically and economically feasible will still result in a lowering of water quality, then the alternatives are subject to the social development analysis to help determine whether lowering water quality is justified.

8) —

2) Economic Analysis

Alternatives that are deemed technically feasible must undergo a present worth or direct cost comparison, as appropriate. General cost categories that should be considered include opportunity cost, annual operating cost, return on investment, and present worth.

[Note: How do you compare alternatives if there is a significant difference in the effective design longevity of alternatives?]

Opportunity costs may be considered in the estimate of overall cost, as appropriate. For example, a lost opportunity cost may be for lots in a proposed subdivision that were used for development of a treatment system rather than housing. Another example would be losses related to process changes resulting in missed production runs. These types of lost opportunity are legitimate and should be documented.

Return on investment can be represented by opportunity cost, operating efficiency, recycling and reuse, chemical or materials savings, and other related economic factors.

In order to develop a standardized framework for projecting, evaluating, and comparing costs associated with various pollution control alternatives, applicants should use a present worth framework for reporting cost information. However, applicants may propose alternate economic demonstrations if appropriate. Alternative direct cost comparisons may be presented if the present worth calculation is complicated by the amount of difference in the effective design longevity of the alternatives examined. The following calculation may be used to determine present worth:

The Department has developed a worksheet for calculating costs (insert link). The worksheet should be completed and submitted with the antidegradation review.

Following the evaluation of possible alternatives, the applicant must select the most non-degrading alternative. However, if the most non-degrading alternative is not economically feasible, then the

applicant must provide a basis for selecting a practicable alternative. A practicable alternative is one that is determined to be the least degrading and most economically efficient and socially beneficial alternative or as otherwise defined by 40 CFR 131.3 (n).

2) 30) Economic and Social Development Analysis

Social-, economic, environmental, or public health issues ~~may~~shall be considered when any lowering of water quality is proposed. This analysis is not necessary if a non-degrading alternative is determined to be the most appropriate option chosen following the alternatives and economic analyses. But if a practicable alternative is selected which results in the lowering of water quality, then the alternative selected must be shown to provide widespread socioeconomic benefits. Factors to be considered in making a determination on widespread socioeconomic benefits include but may not be limited to:

- 1) Employment (e.g. increasing production and jobs, maintaining, or avoiding reduction in employment, permanent or short-term);
- 2) Improved community tax base;
- 3) Abatement or remediation of an environmental or public health problem;
- 4) Providing a social benefit to the community;
- 5) Increasing or improving housing; and
- 6) Providing necessary public services (e.g., fire department, school, infrastructure).

~~If experimental or unproven methods are proposed, ADEQ may request information on previous applications of the method, effectiveness, transferability (if applicable), costs and other information as appropriate. Applications containing proposals for new or experimental methods will be required to append information regarding likely performance results. Such applications may be approved at Director's discretion with the condition that if the proposed technology does not meet project pollutant control targets, the applicant must adopt conventional or other pollution control measures that meet state antidegradation requirements. ADEQ may require that the applicant analyze additional alternatives if an appropriate range of alternatives were not evaluated. ADEQ staff and the applicant should meet to discuss these and other issues early in the process. The applicant should also document any alternatives that were determined to be impracticable and provide a basis for the conclusion.~~

To demonstrate the necessity and importance of the proposed activity, the applicant must provide enough information to allow an analysis that fully assesses whether allowing an activity that lowers water quality has socio-economic benefits that outweigh the environmental costs.

3) Economic Efficiency

~~Alternatives that are deemed practicable must undergo a present worth cost comparison. An analysis of pollution control costs, or economic efficiency, is appropriate when the applicant desires to optimize the balance between water quality benefits and project costs. General cost categories that should be considered include opportunity cost, annual operating cost, and present worth.~~

~~Opportunity costs may be considered in the estimate of overall cost, as appropriate. For example, a lost opportunity cost may be for lots in a proposed subdivision that were used for development~~

~~of a treatment system rather than housing. Another example would be losses related to process changes resulting in missed production runs. These types of lost opportunity are legitimate and should be documented.~~

~~In order to develop a standardized framework for projecting, evaluating, and comparing costs associated with various pollution control alternatives, applicants should use a present worth framework for reporting cost information. However, applicants may propose alternate economic demonstrations if appropriate. Alternative direct cost comparisons may be presented if the present worth calculation is complicated by the amount of difference in the effective design longevity of the alternatives examined. The following calculation may be used to determine present worth:~~

~~The Department has developed a worksheet for calculating costs (insert link). The worksheet should be completed and submitted with the antidegradation review.~~

~~Following the evaluation of possible alternatives, the applicant must provide a basis for selecting the most practicable alternative. A practicable alternative is one that is determined to be the least degrading and most economically efficient, socially beneficial, and affordable alternative or otherwise defined by 40 CFR 131.3 (n).~~

7.7 IMPLEMENTATION OF CONTROLS FOR NONPOINT POLLUTION SOURCES

EPA's regulatory interpretation of 40 CFR§131.12(a)(2) is that federal antidegradation policy does not require ADEQ to establish BMPs for nonpoint source pollution control where regulatory programs requiring BMPs do not exist. The CWA leaves it to the states to determine what, if any, controls on nonpoint sources are needed to provide for attainment of state WQS. States may adopt regulatory or voluntary programs to address nonpoint sources of pollution. Where a state has adopted a regulatory program for nonpoint source pollution control, the state must assure that such controls are properly implemented before authorization is granted to allow lowering of water quality.

Nonpoint source loadings calculated from Total Maximum Daily Loads or derived load allocations are not exempt from antidegradation requirements. ADEQ and the Arkansas Natural Resource Commission (ANRC) will take action to address degradation from nonpoint pollution sources and to restore waters that are impaired by nonpoint sources. Nutrient Management Plans for permits/activities in the Nutrient Surplus Area are one of the avenues ANRC uses for addressing nonpoint pollution. Activities (e.g. agriculture, silviculture, construction, MS4) resulting in a new or expanded amount of pollutants entering waters solely from nonpoint sources are not subject to an antidegradation review prior to these activities commencing.

Compliance shall be considered assured if all applicable BMPs for non-point source are documented and there are no compliance violations. If noncompliance is documented, the appropriate enforcement action and/or compliance schedules will satisfy assurance requirements.

7.8 PUBLIC REVIEW

Prior to approval ~~and issuance~~ of a proposed activity that will cause significant degradation of water quality, public notice is provided in accordance with the APC&EC Regulation No. 8. ~~P~~public reviews will have access to summary information on the proposed activity, the receiving water segment, the BWQ of the receiving water segment, the POCs, the Tier designation, ~~estimated amount of degradation to the receiving waters,~~ the treatment alternatives reviewed, ~~estimated amount of degradation to the receiving waters,~~ and the social and economic analysis of the proposed activity.

7.9 INTERGOVERNMENTAL COORDINATION AND REVIEW

Intergovernmental coordination is required prior to approving any activity that would cause lowering of water quality to surface waters protected at the Tier 2 and Tier 2.5 levels. This requirement seeks to ensure that relevant public entities at the local, state, and federal levels are aware of any proposal to lower water quality and are provided with an opportunity to review, seek additional information, and comment on the proposal.

The intergovernmental coordination and review process may occur in tandem with public notice procedures outlined in the previous section. The time period afforded to commenting agencies will be consistent with the requirements for submission of public comments.

7.10 FINAL ACTION

At the completion of the public review and input process, any comments received will be reviewed, and considered to determine if changes should be made to the proposed activity. ~~A written response to comments will be prepared.~~

Significant changes ~~to permits~~ may require an update to the antidegradation review document for the project and may be subject to an additional public notice. ~~Any~~ ~~Final permit decision~~ ~~shall~~ includes the antidegradation review decision and 208 plan update.

7.11 APPEALS

Antidegradation reviews that propose significant degradation in which the Department has denied may appeal the decision within 30 days of announcement of the decision. After any modification is made that is based on Director's discretion, public or intergovernmental review, a second public notice may be required.

7.12 ANTIDEGRADATION DECISION DIAGRAM

