## ANTIDEGRADATION IMPLEMENTATION METHODS

### 7.1 DEFINITIONS

**Activity:** proposed new or expanded NPDES permits, 2) proposed new or expanded state permits, 3) CWA § 404 dredge and fill permits, 4) any activity requiring a CWA § 401 certification, or 5) result in a lowering of a waterbody's total assimilative capacity by ≥10%.

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

**Antidegradation Implementation:** 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 Antidegradation Implementation is the process by which activities are reviewed.

**Assimilative Capacity:** Ability of body of water to receive pollutants without exceeding a water quality standard specified in APC&EC Regulation No. 2.

**Baseline Water Quality (BWQ):** The BWQ shall be representative of the water quality of the waterbody that is proposed to receive a new or expanded activity. BWQ shall consider existing pollutant contributions at and near critical flow conditions. Once established, BWQ is generally a fixed quantity expressed as a concentration but may be updated where pollution controls improve water quality, for example. 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 (effective data of the policy). BWQ can be estimated by calculation or modeling if water quality data are unavailable or otherwise not appropriate.

**Beneficial Uses:** All existing and designated uses of waters of the State as defined in APC&EC Regulation No. 2.

**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 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

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**Comment [SS1]:** Delete unless this can be determined in quantifiable terms. Too vague and could lead to misunderstandings.

**Deleted:** any activity that may threaten the most sensitive use

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**Comment [SS2]:** Alternatives analysis only required for significant lowering of Tier 2 WQ. "a significant" added.

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**Deleted:** causing harm or damage to aquatic life or human health.

**Comment [SS3]:** How can baseline water quality be "fixed" if it must account for all pollutant contributions (including future contributions or reductions)? I added "generally" in two places to account for changing BWQ.

**Deleted:** at or immediately upstream from the activity.

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**Deleted:** based on mean ecoregion values or the collection of upstream water chemistry over the last five (5) years, whichever is more protective.

"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 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 of waters of the State as defined in APC&EC Regulation No. 2, whether or not it is being attained.

**Effluent: W**ater that is not reused after flowing out of any wastewater treatment facility to waters of the State.

**Exceptional High Quality Water:** 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.,

**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 activity that results in increased concentration or mass of pollutants to waters of the State.

**High Quality Water:** All other waters not defined as Tier 1, 2.5, or 3 and are exceeding water quality criteria. Exceeding water quality criteria means that the 90th percentile of BWQ is less than 95 percent of the water quality criterion for a pollutant of concern.

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

Less-Degrading Alternative: An alternative identified through the alternatives analysis that provides for less degradation than maintaining the water quality standards, but more degradation than the non-degrading alternative.

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

**Comment [SS4]:** Don't think the last half of the sentence accurately defines "effluent."

**Deleted:** or other works used for the purpose of treating, stabilizing, or holding wastes

**Comment [SS5]:** Is this definition needed? It is not mentioned in the document except here. Changed to be consistent with the definition of activity.

**Deleted:** or 5) any activity that threatens the most sensitive use or result in significant degradation, at the time the baseline water quality is determined.

**Deleted:** increased volume of purged water or

**Comment [SS6]:** A definition of what is better than water quality criteria is needed, I added an example.

**Comment [SS7]:** Generally considered in antidegradation as opposed to non-degrading only. Also used in the definition of alternatives analysis.

**Non-Significant Lowering of Water Quality**: A reduction of less than 10 percent of the waterbody's assimilative capacity 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 and cannot be traced back to a single activity.

**Outstanding Resource Waters (ORW):** Waters designated in APC&EC Regulation No. 2 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 discharged 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 economically efficient, socially beneficial, and affordable alternative or as otherwise defined by 40 CFR 131.3 (n).

**Q7-10:** A flow volume equal to 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 assimilative capacity 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 are required to undergo a Tier 2 review.

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**Comment [SS8]:** The most economically efficient may still not be affordable. Likewise, the most affordable may still not be affordable. However, an alternative that is economically efficient would be affordable.

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**Comment [SS9]:** Although I see that this is taken directly from Reg 2 it is not an accurate definition of Q7-10. The Q7-10 is a single calculated value, less than does not apply.

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**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 waterbodies are those where baseline water quality exceeds that of the water quality standard, Tier 2.5 are waterbodies that are currently used for domestic water supply, and Tier 3 are identified outstanding resource waters. See definitions for EUW, HQW, EHQW, and ORW.

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**Temporary Lowering of Water Quality:** Lowering of water quality that is non-permanent and where effects can be regarded as insignificant following a review of 1) 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 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.

**Comment [SS10]:** Not clear how "best possible" water quality would be determined. Will also overestimate the actual total assimilative capacity available.

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**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, or other conditions necessary for a waterbody to fully support a beneficial use. WQC are as defined in APC&EC Regulation No. 2.

**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) conditions for Waters of the State. WQS are as defined in APC&EC Regulation No. 2.

**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.

The Policy protects water quality and beneficial uses from degradation. However, The Policy must also provide for alternatives analysis and methods for exceptions in certain situation (40 CFR § 131.12(a)(2). Lowering of water quality is allowed only after a systematic decision-making process considering many factors. These factors include the classification of the waterbody, consideration of non-degrading alternatives to the proposed activity, and comparison of economic and social benefits of the lowering of water quality 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 cause significant lowering of baseline water quality undergo review and comment prior to any 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 extent of acceptable lowering of water quality, identification of less-degrading or non-degrading alternatives. 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)** applies to waters where baseline water quality is not better than the water quality criteria and that are not otherwise designated HQW, EHQW or ORW. These waters are required to maintain all applicable WQS.

**Tier 2**: **High Quality Waters (HQW)** applies to waters of the State where baseline water quality is better than the water quality criteria, and non-significant degradation would not appreciably lower quality. However, an activity that 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 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 waters may occur up to no more than 10% of the waterbody's remaining assimilative capacity for each parameter. Once a waterbody's assimilative capacity is reached for a parameter, proposed new or expanding activities may



**Comment [SS11]:** To be consistent with the definition of significant lowering of water quality.

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**Comment [SS12]:** Somewhat contradictory with the sentence that follows, which is more specific.

**Deleted:** A waterbody's

**Deleted:** tier identification may be completed on a parameter-by-parameter or waterbody-by-waterbody approach.

**Comment [SS13]:** This is needed to be more consistent with the definition of High Quality Waters.

**Deleted:** 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.

**Deleted:** all other

**Deleted:** for protection of

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**Comment [SS14]:** Non-significant degradation will still lower WQ.

**Deleted:** Tier 1,

**Comment [SS15]:** This needs to be checked out carefully. 10% of assimilative capacity is very restrictive. If "remaining" is added it might give a little room, particularly in those situations when 10% of the waterbody's assimilative capacity has already been used. This is going to be difficult to determine. I really think that this

proceed, but with no net increase of parameter load in excess of 10% of the assimilative capacity.

**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. Tier 3 review is required for those waters encompassed by APC&EC Reg. 2.203 and 40 CFR § 131.12(a)(3).

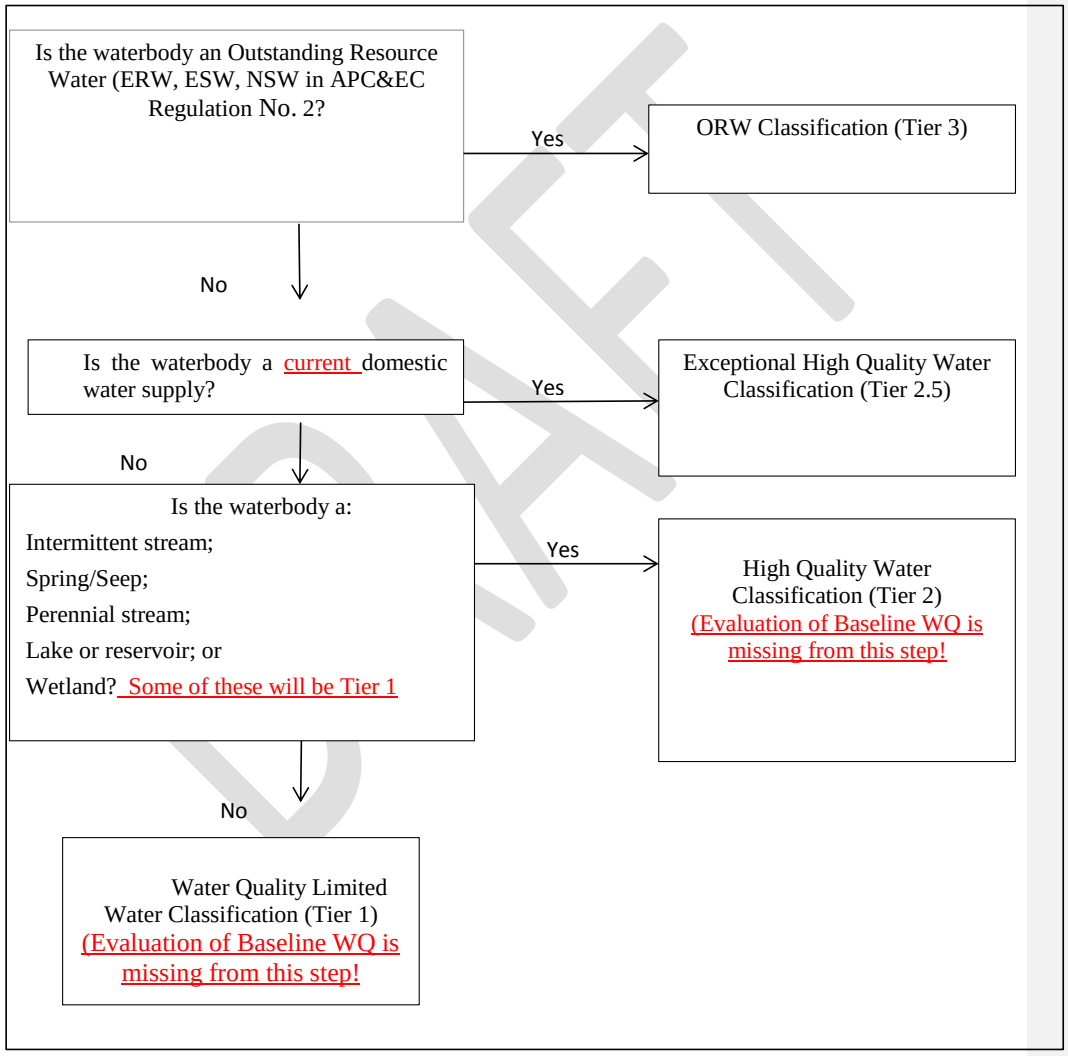


Figure 1. Antidegradation waterbody tier determination diagram.

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

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 waters are those where BWQ is not better than minimum WQS for one or more water quality parameters. Not better than minimum WQS means the 90th percentile of BWQ is equal to or more than 95 percent of the water quality criterion for a pollutant of concern.

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

### B) Tier 2 High Quality Waters (HQW) Evaluation

Waterbodies not defined as Tier 2.5 or Tier 3 are assumed to require Tier 2 review, unless a BWQ demonstration determines that the waterbody is Tier 1. Review of Tier 2 waters will be for all waters of the State where water quality exceeds the WQS, 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. Better than minimum WQS means that the 90th percentile of BWQ is less than 95 percent of the water quality criterion for a pollutant of concern. A significant increase (> 10% of total assimilative capacity) in cumulative pollutant loading, which includes all existing discharges and activities, shall require demonstration that the lowering of water quality is necessary:

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.

**Comment [SS16]:** Tier 1 v. Tier 2 should be based upon a demonstration of BWQ not prescribed. A stormwater control structure or an outfall structure doesn't have designated uses.

**Deleted:** 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.

**Deleted:** other

**Comment [SS17]:** A definition of what is better than water quality criteria is needed.

**Comment [SS18]:** This doesn't apply to HQW. This sentence suggests that even if baseline water quality is much better than water quality standards, if more than 10% of the assimilative capacity is used it isn't a Tier 2.

**Deleted:** Tier 2 waters are those that meet water quality criteria for a parameter and use of less than (<) 10% total assimilative capacity of cumulative pollutant loads, which includes all existing discharges and activities, would still allow the waterbody to remain high quality.

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.

### 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 waters may occur up to 10% of the waterbody's assimilative capacity for each parameter. Once a waterbody's assimilative capacity is reached, proposed new or expanding activities may proceed, but with no net increase of parameter load in excess of the assimilative capacity.

**Comment [SS19]:** Again, very restrictive. See previous comments also.

### D) Tier 3 Outstanding Resource Waters (ORW) Evaluation

ORWs are those named in APC&EC Regulation No. 2 for their outstanding natural or cultural resource value. This ORW 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 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 discharge**: Compliance with the antidegradation policy shall be conducted for all new or expanding wastewater discharges into Arkansas surface waters that require a permit. A new or expanding wastewater discharge is an activity that results in increased concentration or mass of pollutants to waters of the State.

**Renewals:** NPDES permit renewals will not be subject to antidegradation review, provided there are no proposed changes to the facility's effluent which would result in increases in pollutant loadings.

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**Comment [SS20]:** This part is just basic permitting, not antidegradation.

**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.

**Deleted:** However, if impairments are detected from routine monitoring, then changes in permit limits will be require to address subsequent downstream impairments. 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.

**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.

**Comment [SS21]:** This is all vague and should be fleshed out before the document is finalized

**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.

**Comment [SS22]:** This is all vague and should be fleshed out before the document is finalized

### 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, such that any WQS is exceeded. 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 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, the review will be during preliminary limit calculations. Entities may forgo this step and move directly to socio-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, practicable alternatives, the permit application may be approved or denied by ADEQ.

Antidegradation reviews are required for 1) proposed new or expanding NPDES permit discharge that results in a significant lowering of water quality, 2) proposed new or expanding state permits, 3) any activity requiring a CWA § 401 certification that results in a significant lowering of water quality, 4) 5) any other 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 analysis, identification of practicable alternative, and implementation of all cost effective and reasonable BMPs must be provided. Determinations issued under these provisions must be made in accordance with the public participation process.

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**Comment [SS23]:** If it can't be quantified its not really useful for antidegradation. Recommend either explaining what is meant in quantifiable terms or delete the phrase.

**Deleted:** any activity that may threaten the most sensitive use or

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For new and/or expanding 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).

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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.

Step 3. Upon 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 the antidegradation review documentation and begin technical review.

Step 5. Upon completion of the technical review, ADEQ will cause to be published, for a 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. Any 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 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 non-degrading or less degrading alternatives and the social and economic benefits 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 water quality of the waterbody that is proposed to receive a new or expanded activity. BWQ shall consider existing pollutant contributions at low

**Comment [SS24]:** Need to include a step to evaluate baseline water quality relative to the WQS, or the applicant can assume a Tier 2 review is appropriate. This is discussed below the steps in more detail, but still needs to be listed as a general step.

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**Deleted:** The BWQ shall be representative of the water quality at or immediately upstream from the activity. Once established, BWQ is a fixed quantity expressed as a concentration

flow conditions. Once established, BWQ is generally a fixed quantity expressed as a concentration but may be updated where pollution controls improve water quality, for example. 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 (effective data of the policy). If BWQ can not be determined, and the waterbody is not a Tier 2.5 or Tier 3 water, a Tier 2 review is required.

**Deleted:** 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 upstream water chemistry over the last five (5) years, whichever is more protective.

### C) Total Assimilative Capacity

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 are waters where baseline water quality is not better than applicable water quality criteria that are not otherwise designated HQW, EQW or ORW. Tier 1 waters are required to maintain existing uses and water quality standards, and have limited assimilative capacity. Tier 3 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.

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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**:

**Comment [SS25]:** Simple and more common example.

Baseline water quality - water criteria = total assimilative capacity

3 mg/L - 10 mg/L = 7 mg/L

**Deleted:** 10mg

**Deleted:** 3mg

3 mg/L= baseline water quality;

10 mg/L=water quality criteria;

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

ADEQ will maintain waterbody's assimilative capacities 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 remaining assimilative capacity but significant lowering of water quality is precluded. Tier 2 and 2.5 waters Total Assimilative Capacity is finite and allowable assimilative capacity may not exist for certain waterbodies and/or water quality parameters.

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### 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/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 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 by less than 10 percent.

Comment [SS26]: Total or remaining?

Documentation to support a significant or non-significant lowering of water quality may include, but not be limited to an evaluation of the percent change in of the pollutant during appropriate critical periods, including loading calculations or models that result in a determination of percent reduction of assimilative capacity. However, if a non-significant determination is calculated but potential for bioaccumulation impacts to aquatic biota may be present then an antidegradation review may be required.

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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 will result in consumption of less than or equal to 10% of the assimilative capacity. The applicant may proceed with submitting review of baseline water quality, alternatives analysis, and social-economic impact analysis (Section 7.6(E)).

Comment [SS27]: Is this a typo. Do you mean that you can assume that degradation will be significant (= to or > 10%), then proceed with a Tier 2 review? This paragraph says you can assume non-significant. If non-significant degradation will occur, a permittee is not required to review baseline WQ, alternatives analysis or social-economic review.

### E) Alternatives Analysis and Economic 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-economic impacts 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.

#### 1) Alternatives Analysis

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

The analysis should include a description of each alternative in terms of technical, 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) Land application;
8) Project relocation; and
9) Other alternatives.

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.

**2) Economic and Social Development Analysis**

Social-economic, environmental, or public health issues may be considered when lowering water quality. This analysis is not necessary if a non-degrading alternative is chosen following the alternatives analysis. Factors to be considered in making a determination 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 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).

**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.



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**Comment [SS28]:** This seemed to go with alternatives rather than economic and social, moved it to E 1).

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If experimental or unproven methods are proposed, ADEQ may request information on previous

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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 can be completed and submitted with the antidegradation review.

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As a general guideline, alternatives costing less than 120 percent of the base cost of pollution control measures required to maintain WQS are considered economically efficient. Alternatives considered economically efficient are assumed to be affordable unless the applicant provides data that demonstrates otherwise.

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, economically efficient, socially beneficial, and affordable or as otherwise defined by 40 CFR 131.3 (n).

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## 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, sivilculture, 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 permit for a proposed activity that will cause significant degradation of water quality, public notice is provided in accordance with the APC&EC Regulation No. 8. 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, 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 significant 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. Significant changes may require an update to the antidegradation review document for the project and may be subject to an additional public notice. Final permit decision includes the antidegradation review decision and 208 plan update.

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## 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