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Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118
Via email: am-comments@adeq.state.ar.us

RE: 2018 Assessment Methodology

Ms. Barnett,

Thank you for the opportunity to comment on the Draft 2018 Assessment Methodology. This voluntary exercise provides the public with more ways to contribute meaningful suggestions and input to better protect our state's waters. Responding to comments, questions, and concerns will offer insight into ADEQ's approach and will help better inform outside sources of how they can further contribute to the important tasks carried out by the Planning Branch. Taking the time to provide transparency in this process is viewed in high regard. The efforts of the Planning staff on this matter are greatly appreciated. I hope you will view the length and scope of my comments as an expression of the value I hold for this chance to provide input on this integral document.

Comments below are broken out by section and referenced to specific language where applicable.

3.4 Tiered Approach to Qualifying Data –

- *Data received by ADEQ may be used in assessments and for attainment decisions, may be used for screening purposes only, or may not be used at all depending on the level of data quality.*
  Questions and Comments
  - Please describe "screening purposes" and how ADEQ utilizes that data and information. This may help inform outside sources of whether it is worthwhile to submit data to ADEQ that do not meet considerations outlined in the Assessment Methodology.
  - Does ADEQ maintain a Record of Decision for outside datasets that do not meet data quality considerations? If not, this would be valuable information to the public and would provide detailed, meaningful feedback to the entities interested in having their data utilized by ADEQ.
  - A review of ADEQ's 2016 303(d) and 305(b) Integrated Report does not provide any information from datasets utilized for screening purposes. If not incorporated in the 305(b) report, then how does ADEQ make use of these data?

3.7 Statistical Confidence –

- *Table 3: Maximum number of sample exceedances allowed in order to assess as attaining (de-list) water quality standards, using binomial distribution, with 90% confidence that the true exceedance percentage in the waterbody is greater than or equal to 10%, 20%, 2%.*

  Questions and Comments
  - Small typo. Revise 2% to 25%.

3.8 Internal Data Assessment Method –

- WQAR automatically calculates attainment of each standard using station data pulled directly from ADEQs internal Laboratory Information Management System (LIMS).

  Questions and Comments
  - Does WQAR automatically omit duplicate or data that has been flagged by the lab for QA/QC purposes?

3.11 Final Attainment Decision Process

- *Final attainment decisions that differ from initial attainment decisions reached using WQAR (for internal data) or Excel (or similar software for external data, biological data, WET data, etc.) will be justified within the 305(b) report as well as submitted with the 303(d) list for public notice and any supporting documentation will be provided.*

  Questions and Comments
  - What is the methodology for assessing WET data for 303(d)/305(b) determinations?
  - EPA regulations require "reports from dilution calculations and predictive modeling" be included in the data and information that a state considers in its assessment process for section 303(d) listing (Category 5) purposes (40 CFR 130.7(b)(5)(ii))[1]. It is not clear how ADEQ utilizes these data, as it is not addressed in the Assessment Methodology. Please provide further detail on how ADEQ adheres to this requirement.

4.1 Antidegradation –

Questions and Comments
- As noted in Section 4.2, the primary purpose of the 303(d) list of impaired waterbodies is to identify those waters that are not currently meeting water quality standards. Water quality standards include an antidegradation component to *maintain* high quality and outstanding resource waters. Besides specific criteria for bacteria related to Tier III waters, it is not clear how ADEQ evaluates whether waterbodies are *maintaining* the level of water quality for which their designation was granted. The Assessment Methodology outlines a methodology for protecting

[1] 2006 Integrated Reporting Guidance, p. 38. https://www.epa.gov/sites/production/files/2015-10/documents/2006irg-report.pdf

and evaluating Tier I waters. If ADEQ is upholding their Antidegradation Policy when assessing waters for the 303(d) list, it is unclear how ADEQ makes those determinations. Please elaborate and provide information on this process. If ADEQ is using alternative methods for assessing Tier II and Tier III waters, it will benefit the public to have a better understanding of this so outside sources of data can better contribute to ADEQ's assessment process.

4.2 Designated Uses –

- *The support/non-support status of designated uses is most often determined utilizing water quality criteria or other water quality indicators.*
  Questions and Comments
  - If 304(a) recommended criteria were demonstrated to be more protective of designated uses, would ADEQ utilize those over criteria adopted into Regulation No. 2? If the purpose is to assess designated use support, why would ADEQ *not* utilize 304(a) criteria supported by ample documentation?

5.0 Biological Integrity –

Questions and Comments

- This section detailed how biological data would be used to evaluate the biological integrity criteria, and therefore inform the aquatic life designated use assessments. However, no mention is given to how the biological integrity criteria will be used to evaluate extraordinary research waters (ERW) and ecologically sensitive waterbodies (ESW) designated uses. Please provide an explanation for how ADEQ assesses aquatic life designated uses on a tiered approach, especially for ERWs and ESWs, that were designated at least in part, or entirely, for the present aquatic biota.
- Since the only biological data utilized in assessing biological integrity are fish and macroinvertebrate data, how does this protect waters that were designated for the suitable habitat of other species, such as mussels and Ozark hellbenders?
- How are habitat data incorporated into this assessment?

Assessment Methodology for Biological Integrity

- *"Biological data must have been collected over two seasons."*
  Questions and Comments
  - Please define "two seasons" in this context.
  - The purpose of utilizing biological data is to get a more accurate representation of water quality impacts. Discreet monthly water quality samples do not provide a comprehensive picture of overall water quality conditions.
  - Monitoring higher trophic levels (i.e., fish communities) integrates changes happening at lower trophic levels (e.g., primary producers and macroinvertebrates), and can represent stream conditions over long temporal

and spatial scales due to longer life spans, ontological shifts, and increased mobility[2][3]. Biological communities can be affected by a combination of chemical and physical parameters. Relying on the non-attainment of a specific chemical or physical criterion in association with biological data negates the purpose of utilizing biological data.

- Water quality data is not a surrogate for comprehensive biotic assessments and ignores changes in watershed hydrology, habitat modifications, and alteration of energy sources[4]. Paired water quality data is not necessary to validate the accuracy of a scientifically defensible biological monitoring assessment.

Macroinvertebrate Assemblage Analysis

- *Modified metrics set forth in Rapid Bioassessment Protocols for Use in Stream and Rivers (Plafkin et al. 1989) are used in analysis of macroinvertebrate community samples.*

  Questions and Comments
  - Why is Plafkin et al. 1989 utilized instead of Shackleford 1988[5], that was developed specifically for use in Arkansas?
- *See Arkansas's Water Quality and Compliance Monitoring Quality Assurance Project Plan (ADEQ 2016) at the ADEQ website: http://adeq.state.ar.us for more information.*

  Questions and Comments
  - Please update the assessment methodology with the specific web address to this document: https://www.adeq.state.ar.us/water/planning/surface/pdfs/2016-qapp.pdf. The QAPP doesn't actually provide "more information," however.
- *Macroinvertebrate community analysis is as follows. Using raw data, calculate all seven Metric Values for each study site and reference site.*

  Questions and Comments
  - Since the majority of ADEQ's studies are not associated with upstream/downstream sampling designs, what does ADEQ use as a reference site[6]?

[2] Karr, J. R. 1981. Assessment of Biotic Integrity Using Fish Communities. Fisheries 6:21-27.
[3] Smith, M.P., Schiff, R., Olivero, A. and MacBroom, J.G., 2008. THE ACTIVE RIVER AREA: A Conservation Framework for Protecting Rivers and Streams. The Nature Conservancy, Boston, MA. https://www.floods.org/PDF/ASFPM_TNC_Active_River_%20Area.pdf
[4] Karr, J. R. 1981. Assessment of Biotic Integrity Using Fish Communities. Fisheries 6:21-27.
[5] https://www.adeq.state.ar.us/water/planning/pdfs/publications/WQ88-00-0.pdf
[6] A recent FOIA request dated 22 October 2017 included a request for data and information regarding how ADEQ defines "reference" condition. Response materials did not address this topic. This suggests that ADEQ does not have a predefined method for determining reference condition.

- How does ADEQ determine reference condition and how are outside data evaluated to determine whether chosen reference sites meet ADEQ's definition of "reference"?
- "A biological condition score is calculated for each sample and sample site" – This does not address how multiple samples are utilized for a single AU. In the past, ADEQ has collected two macroinvertebrate samples, per site, for two seasons. How are those data utilized? ADEQ is now collecting three discrete macro samples per site, once per year. How are those data going to be used for assessment purposes?
- If ADEQ is utilizing "reference" values for each metric based on the 1987 Ecoregion Reference study[7], please provide the reference scores for each metric.

Other Macroinvertebrate Community Analysis Questions and Comments

- The 1989 Rapid bioassessment protocols for use in streams and rivers is a difficult publication to find online. Could ADEQ please make a copy of this publication available on its website and link the web address in the full citation? Or, even better, also include the actual formulas used to calculate each metric.
- *Hilsenhoff Biotic Index* – What tolerance values does ADEQ apply to their macroinvertebrates? Are there any families of macroinvertebrates that were not assigned tolerance values by Plafkin or Hilsenhoff? Has there been any testing of the appropriateness of these tolerance values in Arkansas? Please make these data and information available.
- *Ratio of EPT to Chironomid Abundances* – What is the advantage of using this metric over the Indicator Assemblage Index, that was referenced by Plafkin[8], and developed by Bruce Shackleford for use in Arkansas?
- *% Contribution of Dominant Taxa* – How are dominant taxa defined? By Order, Family, or Genus? What number of dominant taxa are included in this calculation? The recommended metric for biocriteria in Arkansas compares dominants in common[9].
- *EPT Index* – As Plafkin explains, "headwater streams which are naturally unproductive may experience an increase in taxa (including EPT taxa) in response to organic enrichment. In this situation, a "missing genera" approach may be more valuable." Again, Shackleford (1988) is cited. Are there instances, especially when evaluating attainment of nutrients, when ADEQ utilizes the "missing genera" metric instead?
- *Community Loss Index* – What is the formula for this index?

[7] Physical, Chemical, and Biological Characteristics of Least-Disturbed Reference Streams in Arkansas' Ecoregions, Volume 1: Data Compilation. ADEQ Water Division, 1987. https://www.adeq.state.ar.us/water/planning/pdfs/publications/WQ87-06-1.pdf

[8] See description of Ratio of EPT and Chironomidae Abundance on p. 6-24 of Plafkin 1989.

[9] See Biometric (1) on page 17 of https://www.adeq.state.ar.us/water/planning/pdfs/publications/WQ88-00-0.pdf

- Please provide a comprehensive list of aquatic macroinvertebrates with a table indicating tolerance values that will be assigned for calculating HBI scores.

Fish Assemblage Analysis

Questions and Comments

- Please update the assessment methodology with the specific web address to this document: https://www.adeq.state.ar.us/water/planning/surface/pdfs/2016-qapp.pdf.
- Please incorporate a comprehensive list of fish taxa found in Arkansas and denote which species will be included in the "Sensitive Species" metric[10]. The Fish Community Structure Index[11] denotes criteria that apply to streams and rivers >10 mi^2. It is likely these metrics, and expected values are not applicable in non-wadeable streams. Many species considered more tolerant in smaller streams can be denoted as "sensitive species" in large rivers[12]. Examples include: *Campostoma pullum, Luxilus chrysocephalus, Notropis maculatus, Minytrema melanops, Moxostoma poecilurum, Noturus phaeus, Esox niger, Etheostoma histrio, Percina maculata.*

Fish Assemblage Analysis

- *The fisheries designated use may be assessed as support, despite an initial evaluation of non-support, if it is demonstrated that the non-support assessment is due to unrepresentative biological community data and not an environmental factor (low dissolved oxygen, low pH, toxicity); based on acceptable variances in ecoregion community structures. Under certain conditions, biological community data can be skewed due to an unrepresentative sample, which includes but is not limited to: Collection of irruptive species (e.g., large percentage of young-of-year in an isolated area that is not representative of the entire reach), which could trigger an inaccurate 'non-support' determination.*

  Questions and Comments

  - ADEQ does not have an assessment methodology to evaluate physical habitat or hydrological alteration. Assuming biological data are erroneous based on the limited scope of water quality parameters assessed ignores the purpose of biological data being superior to assessments based solely on measured concentrations of specific chemical and physical parameters.
  - Young-of-year (YOY) should be denoted separately when enumerating fishes. YOY should not be included in *any* of the metric evaluations besides calculating species richness. This should not be an issue.

[10] The "FISHLIST.xls" document that was received from ADEQ in response to 22 October 2017 FOIA request for information on species considered "sensitive" was not a comprehensive list of species found in Arkansas.
[11] See Appendix 4: Fish Community Biocriteria in the 2016 QAPP https://www.adeq.state.ar.us/water/planning/surface/pdfs/2016-qapp.pdf
[12] Shields, F.D., S.S. Knight, and C.M. Cooper. 1995. Use of the Index of Biotic Integrity to Assess Physical Habitat Degradation in Warmwater Streams. Hydrobiologia 312:191-208.

6.1 Temperature –

- *Trout waters will be assessed using discrete data only.*
  Questions and Comments
  - Please explain this rationale.
- *Short-term data sets, such as 72-96 hour diel studies will be used for screening purposes only.*
  Questions and Comments
  - Please explain this rationale.
  - Temperature standards were developed from short-term continuous data monitors[13][14]. This should provide substantial reason to list waters as impaired based on short-term data sets. A limited number of deployments should not warrant a determination that waters are attaining temperature standards, however.
- *Meter must be deployed and taking readings for no less than two-thirds of the critical season at no less than hourly readings.*
  Questions and Comments
  - Since critical season is defined by temperature, then how is this possible to determine whether two-thirds of the critical season was captured?
  - A more appropriate requirement may be to require long-term continuous data to be collected for X number of days within the summer months.

6.2 Turbidity –

- *Stream, river, reservoir, and lake AUs will be assessed as non-support when, using the twenty-five percent exceedance rate within Table 2, greater than or equal to the minimum number of samples for the entire qualifying data set (sample set not to be fewer than 24 data points) exceed the applicable storm flows values listed in APC&EC Reg. 2.503.*
  Questions and Comments
  - A 20% exceedance rate is in effect for storm water values. EPA has not approved the change to 25%[15].
- *Base flows season is defined, in Reg. 2, as June to October.*
  Questions and Comments
  - Please specify what date range will be entered into WQAR. 1 June to 30 September?

6.3 pH –

[13] Physical, Chemical, and Biological Characteristics of Least-Disturbed Reference Streams in Arkansas' Ecoregions, Volume 1: Data Compilation. ADEQ Water Division, 1987. https://www.adeq.state.ar.us/water/planning/pdfs/publications/WQ87-06-1.pdf

[14] Physical, Chemical, and Biological Characteristics of Least-Disturbed Reference Streams in Arkansas' Ecoregions, Volume 2: Data Analysis. ADEQ Water Division, 1987 https://www.adeq.state.ar.us/water/planning/pdfs/publications/WQ87-06-2.pdf

[15] See pages 21-22 of 31 October 2016 letter from EPA including Technical Support Document for EPA Region 6 Review of Regulation No. 2. https://www.adeq.state.ar.us/water/planning/reg2/pdfs/record-of-decision/20161028-final-ar-tsd.pdf

- *AUs will not be listed as "non-attain" if the non-attainment decision is a result of data representing natural conditions (i.e., anthropogenic activities cannot be identified by ADEQ as the source).*
  Questions and Comments
  - Since ADEQ does not collect flow data and does not monitor precipitation, please provide a rationale for how ADEQ can rule out low pH due to acid rain.
  - How will ADEQ make determinations that exceedances are due to "natural causes" and not legacy land use effects?

6.4 Dissolved Oxygen –

- *Critical season: Water temperatures exceed 22 degrees Celsius.*
  Questions and Comments
  - Based on 1987 Ecoregion Reference studies, the basis for the ecoregion-specific temperature and dissolved oxygen criteria, it may not be appropriate to consider the critical season definition based literally on temperature being above 22°C for *all* of the Critical Season DO assessments. Temperatures from Ozark Highland reference streams were far lower than other ecoregions and did not exceed 22°C for a considerable portion of the summer-time studies[16]. Development of critical season DO criteria were not contingent on temperatures absolutely being above 22°C.
- *Continuous data must cover consecutive months for at least two-thirds of critical season with at least hourly readings.*
  Questions and Comments
  - It would be more appropriate to re-word this to state "Continuous data must cover consecutive months for at least two-thirds of the period between mid-May to mid-September with at least hourly readings.

6.6 Bacteria –

- *If the assessment of non-support is based on only one (1) season of data (eight (8) discrete samples within one primary contact season, or within one secondary contact season), the AU will be placed in Category 4b and more data will be collected for re-assessment in a future assessment cycle.*
  Questions and Comments
  - Alternative pollution control requirements must be identified to list a waterbody in Category 4b.
  - Listing in Category 4b requires states to provide a rationale that includes a *description of, and schedule for, monitoring milestones for tracking and reporting progress to EPA on the implementation of the pollution controls and a commitment to revise the implementation strategy and pollution controls if*

[16] Figure T-3, p. 66, Physical, Chemical, and Biological Characteristics of Least-Disturbed Reference Streams in Arkansas' Ecoregions, Volume 2: Data Analysis. ADEQ Water Division, 1987 https://www.adeq.state.ar.us/water/planning/pdfs/publications/WQ87-06-2.pdf

progress towards meeting water quality standards is not being shown[17]. Will this information be made available in the draft 303(d) list that goes out for public comment?

- ADEQ does **not** have a robust bacteria monitoring program (Table 1). There are very few waterbodies that will ever meet the requirements to determine if a TMDL is necessary.
- Only 11 sites sampled by ADEQ between 2012-2017 have two seasons of bacteria data within a period of record[18]. Ten of those sites are part of a two-year bacteria monitoring study of the Mill Creek watershed, a tributary to the Buffalo National River. ADEQ does not routinely collect two seasons of bacteria data.
- Pollution control *requirements* must be identified when placing a waterbody in 4b; therefore, ADEQ will have to adequately identify the likely sources of contamination. Most sources listed in past 303(d) lists are denoted as "unknown." This does not foster confidence in ADEQ's ability to implement additional requirements to the appropriate source.
- What pollution control requirements will be implemented if point source dischargers are the expected source?
- What *requirements* will be implemented to address nonpoint sources?

- Table 1. ADEQ water quality monitoring data were assessed to determine the number of monitoring stations with sufficient data to assess *E. coli* data by contact season[19]. Data from the 2017 primary contact season is outside the period of record for the 2018 303(d) list. The 2017-2018 secondary contact season is not over.

	Number of sites meeting data quality requirements for assessment of:	
Year	Primary Contact Season[20]	Secondary Contact Season[21]
2012	0	0
2013	0	0
2014	0	0
2015	0	0
2016	48	0
2017	18	n/a

6.9 Nutrients –

- Reg. 2.509 states "*Because nutrient water column concentrations do not always correlate directly with stream impairments, impairments will be assessed by a combination of factors such as water clarity, periphyton or phytoplankton production, dissolved oxygen*

[17] 2006 Integrated Reporting Guidance pp. 54-56. https://www.epa.gov/sites/production/files/2015-10/documents/2006irg-report.pdf
[18] Note: Data are from 2016 and 2017 primary contact seasons. The 2017 primary contact season will not be assessed for the 2018 303(d) list. Period of record from 1 April 2012 through 31 March 2017.
[19] Water Quality Monitoring Data Access database was downloaded 5 November 2017 from https://www.adeq.state.ar.us/techsvs/env_multi_lab/water_quality_station.aspx.
[20] May 1 to September 30, Reg. 2.507
[21] October 1 to April 30, Reg. 2.507

values, dissolved oxygen saturation, diurnal dissolved oxygen fluctuations, pH values, aquatic-life community structure and possibly others."

- *The mean total phosphorus or total nitrogen concentration of the monitoring segment is greater than the 75th percentile of the total phosphorus or total nitrogen data from wadeable stream and river AUs within an ecoregion.*
  Questions and Comments
  - Reg. 2.509 acknowledges that "nutrient water column concentrations do not always correlate with stream impairment." Requiring an arbitrary screening value of requiring nutrient water column concentrations must exceed the 75th percentile to be assessed for non-attainment of designated uses ignores that nutrients are often bound and transported in sediments which are deposited on bottom substrates. Including this screening criteria seems to target point sources and ignores nonpoint source runoff. It would be more protective, and therefore more appropriate, to disregard this screening limit when assessing the effects of nutrient enrichment.
  - Will the 75th percentile be calculated from the average concentrations of each site for the period of record?
- *Critical season is defined, in Reg. 2, as that time of year when water temperatures naturally exceed 22 degrees Celsius for the given AU.*
  Questions and Comments
  - Further define how critical season is determined. If the water temperature exceeds 22°C during any portion of the day, would all samples for that day be considered as collected during the critical season?
  - Dissolved oxygen is expected to be lowest during early morning hours before sunrise (before photosynthesis resumes). Therefore, streams would likely gradually be cooling throughout this period of sun cessation. Extreme daytime temperatures would likely exacerbate the stress caused to aquatic life by evening oxygen depletion.
- *Do both of the two 72-hour data sets, or the long-term continuous data set, have and 1 of the 2 water quality translators exceeded?*
  Questions and Comments
  - Why were the three dissolved oxygen translators previously used[22] replaced with "Dissolved oxygen exceeds water quality standard greater than 10% of time". A waterbody now has to be impaired for DO to be impaired for nutrients? Why not add that to the list and determine exceedance at 2 of 5 listed? Please explain how the revised methodology is more protective of designated uses and why the current methodology is more appropriate.

[22] See Table XIV. Nutrient Assessment Flowchart for Wadeable Streams and Rivers in 2016 Assessment Methodology https://www.adeq.state.ar.us/water/planning/integrated/assessment/pdfs/2016-assessment-methodology-draft-04apr16-305b.pdf

- *Macroinvertebrate communities must be collected during the same year as fish collections, during either fall or spring base flow conditions. Fall macroinvertebrate collections are preferred.*
  Questions and Comments
  - According to ADEQ's publication on Biocriteria Development[23], Plafkin et al. 1987 is cited as justification for the statement that in Arkansas, "optimum sampling periods that correspond to stable flows are generally from July through September in the summer and from February through March in the late summer." What is the basis for ADEQ limiting data from summer collections? Please explain why Fall collections are preferred.

6.10 Site Specific Mineral Quality –

- *Stream, river, reservoir, and lake AUs with site specific mineral criteria will be assessed as non-support when, using the twenty-five percent exceedance rate within Table 2, greater than or equal to the minimum number of samples for the entire qualifying data set exceed the applicable site specific mineral criteria listed in APC&EC Reg. 2.511(A).*
  Questions and Comments
  - Previous water quality standards (WQS) set the allowable exceedance limits of these criteria at 10%[24]. ADEQ removed the 10% exceedance language from the current version of Arkansas WQS. EPA disapproved this. Therefore 10% remains in effect for Clean Water Act purposes, such as developing the 303(d) list[25]. Please revise frequency component of the methodology or explain why ADEQ is choosing to ignore EPA's disapproval.

6.11 Non-Site Specific Mineral Quality; and Domestic, Agricultural, and Industrial Water Supply Uses –

- *This section establishes the protocol for determining attainment of non-site specific mineral quality criteria and domestic water supply designated uses within Arkansas's surface waters, per APC&EC Reg. 2.511(C)*
  Questions and Comments
  - This does not address non-site specific mineral quality at all for purposes of determining aquatic life designated uses. This only addresses the assessment of domestic, agricultural, and industrial water supply uses.
  - For all other waters without site-specific standards, there is no attempt to protect aquatic life designated uses. How does this stand up to Arkansas's antidegradation policy? How is this protective of Ecologically Sensitive Waterbody designated

[23] See Seasonality p. 5-6 of Rapid Bioassessments of Lotic Macroinvertebrate Communities: Biocriteria Development (Shackleford 1988). https://www.adeq.state.ar.us/water/planning/pdfs/publications/WQ88-00-0.pdf
[24] See Arkansas Pollution Control and Ecology Commission Regulation 2.511 in the 2004 version of Reg. 2. https://www.adeq.state.ar.us/downloads/regs/oldregs/reg02_final_040517.pdf
[25] See pp. 10-11 of 2007 EPA Record of Decision Arkansas Triennial ("Phase II") Revisions to Regulation No. 2 https://www.adeq.state.ar.us/water/planning/reg2/pdfs/record-of-decision/2007-epa-action-ltr-rod-ar-tr-phase-2.pdf

uses, as well as other Tier III designated uses? How is this protective of Tier II waters?

- ADEQ tried to add language to the WQS stating Reg. 2.511 (B) Ecoregion Reference values would not be used in developing the 303(d) list. EPA did not approve; therefore, where site-specific standards do not apply, aquatic life designated uses should be assessed based on these values[26].
- While it is acknowledged that ADEQ is working with EPA to develop a strategy for minerals, please provide an explanation of why it would not be more protective and appropriate to utilize 2.511 (B) criteria and if a non-attainment decision is derived from these, then to place in Category 5 with a Low priority listing.

6.12 Ammonia –

- *Assessments can be made with discrete samples collected when early life stage fishes are present. The actual months will vary for specific waterbodies.*
  Questions and Comments
  - The 2016 Assessment Methodology stated, "The Chronic Criterion for fish early life stages present apply during the critical season (April 1 thru October 31)." Removing the date range that will be applied as a default will require ADEQ to provide additional information in the 305(b) Report detailing the specific date range that was used for every waterbody. If a default date range is utilized in WQAR, please provide that information.
  - What will be the critical season utilized for trout waters?
  - Are there any date ranges that vary for other waters? Please provide this information so that comments on the 2018 303(d) list can be composed of meaningful data and information if other sources indicate more appropriate dates should be applied.
  - What will be ADEQ's approach for determining the appropriate critical season on a waterbody specific basis?
  - What early life stages will be protected when assessing lakes and reservoirs? What date range will be used?

Best regards,

Jessie J. Green

Jessie J. Green
Executive Director & Waterkeeper

[26] See pp. 18-20 of EPA Record of Decision for Arkansas 2013 Triennial Revisions to Regulation No. 2 https://www.adeq.state.ar.us/water/planning/reg2/pdfs/record-of-decision/20161028-final-ar-tsd.pdf