Exhibit C

Legislative Questionnaire and Financial Impact Statement

QUESTIONNAIRE FOR FILING PROPOSED RULES AND REGULATIONS WITH THE ARKANSAS LEGISLATIVE COUNCIL AND JOINT INTERIM COMMITTEE

DEPARTMENT/AGENCY Arkansas Department of Environmental Quality

DIVISION Water Division

DIVISION DIRECTOR Steve Drown, Water Division Chief/Ryan Benefield, ADEQ Deputy Director

CONTACT PERSON Jamie Ewing, Attorney Specialist

ADDRESS 5301 Northshore Drive, North Little Rock, AR, 72118

PHONE NO. (501) 682-0918 **FAX NO.** (501) 682-0891 **E-MAIL** ewing@adeq.state.ar.us

NAME OF PRESENTER AT COMMITTEE MEETING Teresa Marks, ADEQ Director

PRESENTER E-MAIL marks@adeq.state.ar.us

INSTRUCTIONS

A. Please make copies of this form for future use.
B. Please answer each question completely using layman terms. You may use additional sheets, if necessary.
C. If you have a method of indexing your rules, please give the proposed citation after "Short Title of this Rule" below.
D. Submit two (2) copies of this questionnaire and financial impact statement attached to the front of two (2) copies of the proposed rule and required documents. Mail or deliver to:

Donna K. Davis
Administrative Rules Review Section
Arkansas Legislative Council
Bureau of Legislative Research
Room 315, State Capitol
Little Rock, AR 72201

****

1. What is the short title of this rule? Regulation No. 2, Regulation Establishing Water Quality Standards for Surface Waters of the State of Arkansas

2. What is the subject of the proposed rule? Triennial review and revision of the State's water quality standards, as required by the federal Water Pollution Control Act ("Clean Water Act")

3. Is this rule required to comply with a federal statute, rule, or regulation? Yes ☒ No ☐

If yes, please provide the federal rule, regulation, and/or statute citation.
The regulation must comply with the federal Clean Water Act, 33 U.S.C. § 1251 et seq. and regulations promulgated thereunder.

4. Was this rule filed under the emergency provisions of the Administrative Procedure Act? Yes ☐ No ☒

If yes, what is the effective date of the emergency rule? _____

When does the emergency rule expire? _____

Will this emergency rule be promulgated under the permanent provisions of the Administrative Procedure Act? Yes ☐ No ☐

5. Is this a new rule? Yes ☐ No ☒

If yes, please provide a brief summary explaining the regulation.

Does this repeal an existing rule? Yes ☐ No ☐
If yes, a copy of the repealed rule is to be included with your completed questionnaire. If it is being replaced with a new rule, please provide a summary of the rule giving an explanation of what the rule does.

Is this an amendment to an existing rule? Yes ☒ No ☐
If yes, please attach a mark-up showing the changes in the existing rule and a summary of the substantive changes. **Note: The summary should explain what the amendment does, and the mark-up copy should be clearly labeled "mark-up."**

6. Cite the state law that grants the authority for this proposed rule?
If codified, please give Arkansas Code citation.
The Arkansas Water and Air Pollution Control Act, Ark. Code. Ann. § 8-4-101 et seq., including but not limited to Ark. Code Ann. § 8-4-202(b)(3).

7. What is the purpose of this proposed rule? Why is it necessary?
Pursuant to the Federal Water Pollution Control Act ("Clean Water Act"), 33 U.S.C. § 1251 et seq., Arkansas has been delegated the authority to establish and administer water quality standard. The water quality standards are administered through the Arkansas Water and Air Pollution Control Act, Ark. Code Ann. § 8-4-101 et seq. The Clean Water Act requires states to review their water quality standards on a triennial basis and to amend those standards as necessary. This proposed rule is the result of that process. The proposed changes are necessary to ensure that waters of the State are maintained and protected, in accordance with the Clean Water Act and the Arkansas Water and Air Pollution Control Act.

Please see Attachment 1 to this form. Many of the changes proposed in this rulemaking are intended to clarify the regulation through formatting changes or grammatical revisions. Also, several revisions are proposed to comply with the Arkansas Pollution Control and Ecology Commission's Regulation Drafting Guidelines.

8. Please provide the address where this rule is publicly accessible in electronic form via the Internet as required by Arkansas Code § 25-19-108(b).
After initiation of the rulemaking process by the Arkansas Pollution Control and Ecology Commission, the proposed rule and all related documents, including this form, will be available here:
http://www.adeq.state.ar.us/regs/drafts/draft_regs.htm

9. Will a public hearing be held on this proposed rule? Yes ☒ No ☐

If yes, please complete the following:

Date: (multiple dates - see below)

Time: _____

Place: Jonesboro - Allen Park Community Center; April 15, 2013; 6:00 p.m.;

Fayetteville - Favetteville City Adminstration Building, Room 219; April 18; 6:00 p.m.;
El Dorado - South Arkansas Community College, East Campus, Workforce Development Building; April 22; 6:00 p.m.;
North Little Rock - ADEQ Headquarters, Commission Room; April 24; 2:00 p.m.

10. When does the public comment period expire for permanent promulgation? (Must provide a date.) — May 8, 2013 (or ten days after last public hearing)

11. What is the proposed effective date of this proposed rule? (Must provide a date.) — November 2013

12. Do you expect this rule to be controversial? Yes ☒ No ☐

If yes, please explain. Changes to the water quality standards have often been controversial. Even though ADEQ engaged in an extensive stakeholder process, not every participant may agree with the outcome. The list of interested parties provided in response to question 13 below includes the list of parties invited to participate in the stakeholder process.

13. Please give the names of persons, groups, or organizations that you expect to comment on these rules? Please provide their position (for or against) if known.

Arkansas Environmental Federation (support in part and oppose in part)
Environmental organizations, such as the Arkanas Canoe Club, Ozark Society, The Nature Conservancy, etc. (support majority of changes, possibly oppose in part)
Arkansas Department of Health
Arkansas Farm Bureau
Arkansas Municipal League
University of Arkansas Extension Service
Arkansas Natural Resources Commission
Arkanas Natural Heritage Commission
Arkansas Game and Fish Commission
United States Fish and Wildlife Service
United States Environmental Protection Agency
United States Forest Service
Beaver Water District
United States Army Corps of Engineers

FINANCIAL IMPACT STATEMENT

PLEASE ANSWER ALL QUESTIONS COMPLETELY

DEPARTMENT Arkansas Department of Environmental Quality

DIVISION Water Division

PERSON COMPLETING THIS STATEMENT Jamie Ewing, Attorney Specialist

TELEPHONE NO. (501) 682-0918 **FAX NO.** (501) 682-0891 **EMAIL:** ewing@adeq.state.ar.us

To comply with Act 1104 of 1995, please complete the following Financial Impact Statement and file two copies with the questionnaire and proposed rules.

SHORT TITLE OF THIS RULE Regulation No. 2, Regulation Establishing Water Quality Standards for Surface Waters of the State of Arkansas

1. Does this proposed, amended, or repealed rule have a financial impact? Yes ☐ No ☒

2. Does this proposed, amended, or repealed rule affect small businesses? Yes ☒ No ☐
   If yes, please attach a copy of the economic impact statement required to be filed with the Arkansas Economic Development Commission under Arkansas Code § 25-15-301 et seq.

Please see Attachment 2.

3. If you believe that the development of a financial impact statement is so speculative as to be cost prohibited, please explain.

Not applicable.

4. If the purpose of this rule is to implement a federal rule or regulation, please give the incremental cost for implementing the rule. Please indicate if the cost provided is the cost of the program.

Current Fiscal Year		**Next Fiscal Year**	
General Revenue		General Revenue	
Federal Funds	$212,058.97 - based on federal grant application to implement this portion of the Clean Water Act program during FY13	Federal Funds	$212,058.97 - estimated to be the same as previous year, as the number does not vary much from year to year, but ADEQ has not submitted grant application for FY14
Cash Funds		Cash Funds	
Special Revenue		Special Revenue	
Other (Identify)		Other (Identify)	
Total	$212,058.97	Total	$212,058.97

5. What is the total estimated cost by fiscal year to any party subject to the proposed, amended, or repealed rule? Identify the party subject to the proposed rule and explain how they are affected.

Current Fiscal Year	**Next Fiscal Year**
$ 0	$ 0

See pages 16-21 of Attachment 3 to this form. This document is the Economic Impact/Environmental Benefit Analysis prepared in accordance with Arkansas Pollution Control and Ecology Commission Reg.8.812.

6. What is the total estimated cost by fiscal year to the agency to implement this rule? Is this the cost of the program or grant? Please explain.

Current Fiscal Year	**Next Fiscal Year**
$ _____	$ _____

See Question 4 above and Attachment 3. The cost will covered by federal grant monies for state implementation of the federal Clean Water Act.

Attachment 1

List of Proposed Changes to Regulation No. 2

2013 Regulation No. 2 Revisions and Justifications Document

Major Revisions

1. **Revision: Table of Contents: Appendix C:** Replace title "SCIENTIFIC NAMES OF FISHES" with "SCIENTIFIC NAMES OF AQUATIC BIOTA."
   Justification: Appendix C is being revised to include scientific names of all aquatic biota in the regulation, not just fishes.

2. **Revision: Table of Contents: Appendix D:** Replace title "PROCEDURES FOR OBTAINING DIRECTOR'S DETERMINATION ON THE PROPOSED PHYSICAL ALTERATION OF AN EXTRAORDINARY RESOURCE WATERS, ECOLOGICALLY SENSITIVE WATERBODY, OR NATURAL AND SCENIC WATERWAY" with "LIST OF CURRENT EXTRAORDINARY RESOURCE WATERS, ECOLOGICALLY SENSITIVE WATERBODIES, AND NATURAL AND SCENIC WATERWAYS."
   Justification: EPA disapproved the current appendix D.

3. **Revision: 2.101:** Revise this sections as follows: "Pursuant to ~~the provisions of SubChapter 2 of~~ the Arkansas Water and Air Pollution Control Act, ~~(Act 472 of the Acts of Arkansas for 1949, as amended;~~ (Ark. Code Ann. § 8-4-101 ~~et seq~~ *et seq.*), and in compliance with the requirements of the Federal Water Pollution Control Act, 33 U.S.C. § 1251 *et seq.*, ~~as amended~~ (hereinafter "Clean Water Act"), the Arkansas Pollution Control and Ecology Commission, ~~(~~hereinafter ~~referred to as~~ "Commission") hereby promulgates this ~~R~~regulation ~~No. 2, as amended,~~ establishing water quality standards for all surface waters, interstate and intrastate, of the State of Arkansas."
   Justification: These revisions provide more accurate reference to the legal codes and acts.

4. **Revision: Reg. 2.105:** Revise this section as follows: The Commission may, after consideration of ~~the~~ information provided pursuant to Appendix B and Ark. Code Ann. § 8-5-901 *et seq.*, grant modifications to the General and Specific Standards ~~(Chapters 4 and 5, herein)~~ or establish a subcategory(ies) of use(s) ~~(Reg. 2.307, herein)~~ for completion of long-term Environmental Improvement Projects. ~~(EIP), as provided by Act 401 of 1997, codified at A.C.A. § 8-5-901.~~
   Justification: These revisions provide more accurate reference to the legal codes and acts. The EIP acronym is not used elsewhere in the document and is therefore unnecessary.

5. **Revision: Reg. 2.106:** Revise the third and fourth inset of the definition of "Critical flow" as follows:

   For minerals criteria - ~~harmonic mean flow or 4 cfs, except in those waters listed inReg. 2.511. Those waters in Reg. 2.511 which are noted with an asterisk will have a critical flow of 4 cfs. (Also see minerals implementation procedure in CPP)~~

   - Reg. 2.511(A)(1) Site specific standards: Q7-10.
   - Reg. 2.511(A)(2) Site specific standards: Flow stated in site specific criteria documentation.
   - Reg. 2.511(B) Ecoregion Reference Stream Minerals Values: Harmonic mean flow; if no data is available to calculate a harmonic mean flow, permits shall contain a "monitor and

report" condition (for a period of time not to exceed three years) until such time as the harmonic mean flow can be determined.

- Reg. 2.511 (C) Domestic Water Supply Criteria: Q7-10.

For ~~all others~~ metals and conventional pollutants: The critical flow will be Q7-10.

(Also see minerals implementation procedure in State of Arkansas Continuing Planning Process).

Justification: Clarification in this section will allow appropriate flow data to be used in implementation of minerals criteria. The use of an accurate stream flow or harmonic mean flow in calculating permit limitations results in appropriate pollutant concentrations in permits and will protect designated uses. If an inaccurate flow was used, the permit limitation would be inappropriate for actual conditions and could result in the stream being added to the List of Impaired Waterbodies.

6. **Revision: Reg. 2.106:** Revise "Harmonic mean flow" definition to:
   "Harmonic mean flow: The number of daily flow measurements divided by the sum of the reciprocals of the daily flows. For the purpose of determining critical flow, a minimum of twenty-four (24) samples each collected at least thirty (30) days apart is required."
   Justification: Clarify meaning of definition.

7. **Revision: Reg. 2.304:** Revert to the language (2004) previously approved by EPA.
   Justification: In 2007, EPA disapproved the current language because they felt it went against the antidegradation policy.

8. **Revision: Reg. 2.404:** Add "pH (except as specified in 40 CFR 133.102(c))" in the first sentence of the third paragraph.
   Justification: As defined in Section 2.504 of Reg. No. 2, pH must be applied as end-of-pipe. The State of Arkansas Continuing Planning Process exempts pH from mixing zones. As per EPA's Technical Support Document For Water Quality-based Toxics Control (1991), mixing zones apply for acute and chronic criteria. pH does not have acute or chronic criteria.
   Mixing zone allowances will increase the mass loading of a pollutant. A mass loading cannot be calculated for pH.

9. **Revision: Reg. 2.404:** Revise the last three sentences of this section as follows:
   Mixing zones shall not prevent the free passage of fish or significantly affect aquatic ecosystems. Careful consideration will be given to the appropriateness of a mixing zone where a substance discharged is bioaccumulative, persistent, carcinogenic, mutagenic, or teratogenic.

   A mixing zone shall not apply to any public or private domestic water supply intake or public water supply well.

   ~~A mixing zone shall not include any domestic water supply intake.~~
   Justification: EPA recommendation for clarification of regulation.

10. **Revision: Reg. 2.502, Reg. 2.503, 2.505, and 2.511:** Add "applicable at 1.0 meter depth" under lakes and reservoirs .
Justification: Clarify the appropriate sampling depth for lakes and reservoirs to be consistent with the procedures utilized during standards development.

11. **Revision: Reg. 2.504:** Add "No mixing zones are allowed for pH (except as specified in 40 CFR 133.102(c))."
Justification: As defined in Section 2.504 of Reg. No. 2, pH must be applied as end-of-pipe. The State of Arkansas Continuing Planning Process exempts pH from mixing zones. As per EPA's Technical Support Document For Water Quality-based Toxics Control (1991), mixing zones apply for acute and chronic criteria. pH does not have acute or chronic criteria.
Mixing zone allowances will increase the mass loading of a pollutant. A mass loading cannot be calculated for pH.

12. **Revision: Reg. 2.505:** In the sentence above table replace "must be met" with "are applicable:"
Justification: EPA is encouraging ADEQ to move away from using such definitive language. Based on recent litigation, EPA has stated that language such as "must be met" may not be appropriate for state assessment methodology that allows for more than one exceedance.

13. **Revision: Reg. 2.505:** Revise second paragraph as follows:
"All streams with watersheds of less than 10 mi^2 are expected to support *aquatic life* during the primary season when stream flows, including discharges, equal or exceed 1 cubic foot per second (cfs). However, when site verification indicates that *aquatic life* exists at flows below 1 cfs, such *aquatic biota* will be protected by the primary standard (Refer to the State of Arkansas Continuing Planning Process for field verification requirements)."
Justification: To clarify when small watersheds are expected to support aquatic life. Also, the "CFS" acronym is revised to "cfs" for standardization of text.

14. **Revision: Reg. 2.507:** Reformat this section as follows:
"For the purposes of this regulation, all streams with watersheds less than 10 mi^2 shall not be designated for primary contact unless and until site verification indicates that such use is attainable. No mixing zones are allowed for discharges of bacteria.

For assessment of ambient waters, at least eight (8) data points must be taken during the primary contact season or during the secondary contact season.

The following standards are applicable:

Contact Recreation Seasons	**Limit (col/100ml)**			
Primary Contact*	*E. coli*		Fecal Coliform	
	IS[1]	GM[2]	IS[1]	GM[2]
ERW, ESW, NSW, Reservoirs, Lakes	298	126	400	200

Contact Recreation Seasons			Limit (col/100ml)	
All Other Waters	410	-	400	200
Secondary Contact**				
ERW, ESW, NSW, Reservoirs, Lakes	1490	630	2000	1000
All Other Waters	2050	-	2000	1000

1 – Individual Sample Criteria
2 – Geometric Mean – Calculated on a minimum of five samples spaced evenly and within a thirty-day period.
* - May 1 to September 30
** - October 1 to April 30

The Arkansas Department of Health has the responsibility of approving or disapproving surface waters for public water supply and of approving or disapproving the suitability of specifically delineated outdoor bathing places for body contact recreation, and it has issued rules and regulations pertaining to such uses."

Justification: Easier to interpret.

15. **Revision: Reg. 2.508:** Replace the first sentence with the following:
    "The following standards for toxic substances in receiving waters, after mixing, represent the concentrations that will not be toxic to human, animal, plant, or aquatic biota, or will not interfere with the normal propagation, growth, and survival of the indigenous aquatic biota."
    Justification: EPA is encouraging ADEQ to move away from using such definitive language.

16. **Revision: Reg. 2.508:** Replace "may not be exceeded" with "apply" in the second sentence and replace "shall not be exceeded" with "apply" in the third sentence.
    Justification: EPA is encouraging ADEQ to move away from using such definitive language.

17. **Revision: Reg. 2.508:** Remove "Never to Exceed" from the "Aquatic Life Criteria" table.
    Justification: EPA is encouraging ADEQ to move away from using such definitive language.

18. **Revision: Reg. 2.509**: Add Beaver Lake criteria:

Lake	Chlorophyll a (ug/L)**	Secchi Transparency (m)***
Beaver Lake*	8	1.1

*These standards are for measurement at the Hickory Creek site over the old thalweg, below the confluence of War Eagle Creek and the White River in Beaver Lake.
**Growing season geometric mean (May - October)
***Annual Average

Justification: The numeric criteria for Beaver Lake are based on the recommendation of the Beaver Lake Scientific Workgroup. Additionally, EPA has been requesting the states to move forward with nutrient criteria development.

19. **Revision: Reg. 2.509**: Remove text:

"All point source discharges into the watershed of waters officially listed on Arkansas' impaired waterbody list (303d) with phosphorus as the major cause shall have monthly average discharge permit limits no greater than those listed below. Additionally, waters in nutrient surplus watersheds as determined by Act 1061 of 2003 Regular Session of the Arkansas 84th General Assembly and subsequently designated nutrient surplus watersheds may be included under this Reg. if point source discharges are shown to provide a significant phosphorus contribution to waters within the listed nutrient surplus watersheds.

Facility Design Flow – mgd	Total Phosphorus discharge limit – mg/L
= or > 15	Case by case
3 to <15	1.0
1 to <3	2.0
0.5 to <1.0	5.0
<0.5	Case by Case

For discharges from point sources which are greater than 15 mgd, reduction of phosphorus below 1 mg/L may be required based on the magnitude of the phosphorus load (mass) and the type of downstream waterbodies (e.g., reservoirs, Extraordinary Resource Waters). Additionally, any discharge limits listed above may be further reduced if it is determined that these values are causing impairments to special waters such as domestic water supplies, lakes or reservoirs or Extraordinary Resource Waters."
Justification: Based on recent litigation, EPA has stated that the phosphorus effluent limitations that were approved in 2004 are not water quality based standards designed to maintain and protect designated uses and therefore are not appropriate.

20. **Revision: Reg. 2.509**: Revise last sentence to read " However, when excess nutrients result in an impairment, based upon Department assessment methodology, by any Arkansas established, numeric water quality standard, the waterbody will be determined to be impaired by nutrients.
Justification: Clarification of which water quality standards are used to determine nutrient impairment.

21. **Revision: Reg. 2.510**: Replace "As a guideline, oil and grease shall not exceed 10 mg/l average or 15 mg/l maximum when discharging to surface waters" with, "Oil and grease shall not be added to any waterbody in excess of an average of 10 mg/L or a maximum of 15 mg/L when discharged to surface waters."
Justification: Reg. 2.510 is a standard, not a guideline. Based on recent litigation, EPA has stated that language such as "shall not exceed" may not be appropriate for standards when the states assessment methodology allows for more than one exceedance.

22. **Revision: Reg. 2.511(A):** Reformat 2.511(A) as follows: Current 2.511(A) will be subdivided into (A)(1) and (A)(2) which will also split the table therein into two tables. The new 2.511(A)(1) will include streams with site specific criteria developed by ADEQ. The new 2.511(A)(2) will include

streams with site specific criteria developed by a third party.
Justification: This will follow the format of the minerals section of the Critical flow definition and therefore make the minerals section easier to interpret.

23. **Revision: Reg. 2.511(A)**: In the second sentence of the first paragraph, replace "limits" with "criteria."
Justification: Clarification of the intent of the section; the numbers represent criteria, not limitations used in the permitting process.

24. **Revision: Reg. 2.511(A)**: Revise Bayou Two Prairie in table. (Include revision in Delta section of Appendix A.)

~~Bayou Two Prairie (mouth to Rickey Branch)~~	~~95**~~	~~45**~~	~~ER~~
Bayou Two Prairie (Rickey Branch to Northern boundary of Smoke Hole Natural Area)	95	45	411.3
Bayou Two Prairie (Southern boundary of Smoke Hole Natural Area to Mouth)	95	45	411.3

Justification: EPA Record of Decision received August 5, 2008.

25. **Revision: Reg. 2.511(A):** Revise Bayou Bartholomew in table as follows:

Bayou Bartholomew	~~50~~ 30	~~20~~ 30	~~500~~ 220

Justification: The 2007 version of Reg. No. 2 was inadvertently changed; the numbers from the 2004 version are the correct site specific standards.

26. **Revision: Reg. 2.511(A):** Add the following stream segments to the site specific mineral quality criteria table between Lost Creek Ditch and Bayou DeView listings:

Big Creek Ditch to Bayou DeView	20	30	270

Justification: According to the Herman 7.5 minute Quadrangle, Arkansas Atlas & Gazetteer, AGFC's Arkansas Outdoor Atlas, and USGS NHD High Resolution Flowline, the upper reaches of Bayou DeView are named Big Creek Ditch, with the uppermost reaches (headwaters) being named Lost Creek Ditch.

27. **Revision: Reg. 2.511(A):** Remove the following stream segments from the site specific mineral quality criteria table:

Unnamed trib from GLCC 003	538*	35*	519*
Unnamed trib to Little Cornie Bayou	305*	ER	325*
Little Cornie Bayou from unnamed trib to Louisiana State Line	215*	25*	500*

Justification: Disapproved by EPA Record of Decision ("ROD") dated April 14, 2009.

28. **Revision: Reg. 2.511(A):** Remove the following stream segments from the site specific mineral quality criteria table:

Haynes Creek from mouth of Flat Creek to	360*	55*	855*

Smackover creek			
Flat Creek from mouth of UTA to Haynes Creek	165*	67*	560*
Unnamed trib A to Flat Creek from mouth of EDCC 001 ditch to confluence with Flat Creek	16*	80*	315*
Confluence with unnamed trib A to Flat Creek	23*	125*	475*

Justification: Disapproved by EPA RODs dated April 14, 2009 and August 31, 2011.

29. **Revision: Reg. 2.511(A):** Remove the following stream segments from the site specific mineral quality criteria table:

Bayou de L'Outre Creek above Loutre Creek	180	ER	970
Unnamed trib UT004 from GLCC	014*	ER	311*
Unnamed trib UT002 from GLCC	278*	90*	500*
Loutre Creek- from AR Hwy 15 South to the confluence of Bayou de Loutre	256*	997*	1756*
Bayou de Loutre – from Loutre Creek to the discharge for the City of El Dorado - South facility	264*	635*	1236*
Bayou de Loutre – from the discharge for the City of El Dorado-South downstream to the mouth of Gum Creek	250*	431*	966*
Bayou de Loutre – from the mouth of Gum Creek downstream to the mouth of Boggy Creek	250*	345*	780*

Justification: Disapproved by EPA ROD dated April 14, 2009.

30. **Revision: Reg. 2.511(A):** Remove the following stream segments from the site specific mineral quality criteria table:

Boggy Creek - from the discharge for Clean Harbors El Dorado LLC to the confluence of Bayou de Loutre	631*	63*	1360*
Bayou de Loutre- from the mouth of Boggy Creek downstream to the mouth of Hibank Creek	250*	296*	750*
Bayou de Loutre – from the mouth of Hibank Creek downstream to the mouth of Mill Creek	250*	263*	750*
Bayou de Loutre – from the mouth of Mill Creek downstream to the mouth of Buckaloo Branch	250*	237*	750*
Bayou de Loutre- from the mouth of Buckaloo Branch downstream to the mouth of Bear Creek	250*	216*	750*
Bayou de Loutre – from the mouth of Bear Creek downstream to the final segment of Bayou de loutre	250*	198*	750*
Bayou de Loutre (Final segment) – from the mouth	250*	171*	750*

of Bear Creek to the Arkansas/Louisiana State Line			

Justification: Disapproved by EPA ROD dated April 14, 2009.

31. **Revision: Reg. 2.511(B):** Revise this section as follows: "The following values ~~determined~~ were derived from Arkansas' least-disturbed ecoregion reference streams and are considered to be the maximum naturally occurring ~~levels~~ values. For waterbodies not listed in Reg. 2.511(A)(1) and (A)(2) ~~above~~, any discharge-which results in instream concentrations, after mixing, more than 1/3 higher than these values for chlorides (Cl^-) and sulfates ($SO_4^{=2}$) or more than 15 mg/~~l~~L, whichever is greater, is considered to be a significant modification of the ~~water quality~~ maximum naturally occurring values. These waterbodies should be considered as candidates for a modification in accordance with Regs. 2.306 and 2.308. Similarly, such modification ~~exists~~ should be considered if the following TDS values are exceeded after being increased by the sum of the increases to Cl and SO_4. Such modifications may be made only in accordance with Regs. 2.306., and 2.308. The values listed in the table below are not intended to be, nor will be, used by the Department to evaluate attainment of the water quality standards."
Justification: Replacing "determined" with "were derived" is a more accurate way of expressing the values' origin. Replacing "levels" with "values" clarifies that these are values. Insertion of "in Reg. 2.511(A)(1) and (A)(2)" is necessary with the restructuring of the entire 2.511 section. Adding "Chlorides" and "Sulfates" and placing empirical formulae in parentheses defines the symbols. Deletion of "instream" and "water quality" and insertion of "maximum naturally occurring values and should be considered as candidates for a modification in accordance with Reg. 2.306 and 2.308." clarifies that these are values, not standards. Inclusion of the "s" after Reg and the addition of ", and 2.308" calcifies that both regulations are necessary for water quality modifications. Addition of "the values listed in the table below are not intended nor will these values be used by the Department to evaluate attainment of the designated uses" clarifies that these values are not intended to be used in designated use attainment.

32. **Revision: Reg. 2.511(B)**: Replace the existing table of calculated Ecoregional values with a table that shows the original (non-calculated) Ecoregional values from 2004 Reg. 2.
Justification: Clarification of the values for implementation purposes.

33. **Revision: Reg. 2.511(C):** Replace "limits" with "criteria."
Justification: Reg. No. 2 is not a permitting document; it contains water quality standards and criteria. Criteria is the more appropriate term.

34. **Revision: Reg. 2.512** - Revise the first sentence to read "The total ammonia nitrogen (N) criteria and the frequency of occurrence are as follows:"
Justification: Based on recent litigation, EPA has stated that language such as "shall not exceed" may not be appropriate for standards when the states assessment methodology allows for more than one exceedance.

35. **Revision: Appendix A:** Throughout Appendix A, addition of several threatened and endangered or endemic species to currently designated ESW stream segments.

Justification: Please see attached "Proposed Species to be added to ESW list in Reg. 2."

36. **Revision: Appendix A:** Update plates to use National Hydrography Dataset ("NHD") based GIS files.
Justification: NHD GIS data is the most accurate updated GIS data.

37. **Revision: Appendix A: GC:** Add "Loutre creek from Highway 15 S. to the confluence of Bayou de Loutre – no domestic water supply use (GC-2, #41)" under Designated Use Variation Supported by UAA.
Justification: Approved by EPA ROD dated April 14, 2009.

38. **Revision: Appendix A: GC:** Add:
"Unnamed trib 002 (UT002) – no domestic water supply use (GC-2, #31)",
"Unnamed trib 003 (UT003) – no domestic water supply use (GC-2, #34)",
"Unnamed trib 004 (UT004) – no domestic water supply use (GC-2, #32)" and
"Unnamed trib to Little Cornie Bayou (UTLCB-2) - no domestic water supply use (GC-2, #18)"
under Designated Use Variation Supported by UAA.
Justification: Approved by EPA ROD dated November 9, 2007.

39. **Revision: Appendix A: GC:** Under Designated Use Variation Supported by UAA, removal of domestic water supply designated use revise to read "Bayou de Loutre from ~~Gum Creek~~ mouth of UT004 to State line - no domestic water supply use (GC-2,#16)."
Justification: Per EPA ROD April 14, 2009, EPA approved Domestic Water Supply designated use removal for Bayou de Loutre from the mouth of UT004 to Gum Creek. Domestic Water Supply designated use removal for Bayou de Loutre from Gum Creek to State line is already part of the current Reg. 2., thus the entire reach from Bayou de Loutre from mouth of UT004 to State line has no domestic water supply use.

40. **Revision: Appendix A: GC:** Remove the following stream segments from Variations Supported by UAA:
    - Unnamed tributary from Great Lakes Chemical Company Outfall 004 to Bayou de Loutre- chloride 239 mg/l, TDS 324 mg/l (GC-2, #32)
    - Bayou de Loutre from mouth of UT004 to mouth of Loutre Creek, chloride 278 mg/L (GC-2, #33)
    - Unnamed tributary from Great Lakes Chemical Company Outfall 003 (UT003) downstream to unnamed tributary to Little Cornie Bayou – chloride 538 mg/L, sulfate 35 mg/L, and TDS 519 mg/L (GC-2, #34)
    - Unnamed tributary of Little Cornie Bayou to confluence with Little Cornie Bayou – chloride 305 mg/L and TDS 325 mg/L (GC-2, #35)
    - Little Cornie Bayou from mouth UTA to state line- chloride 215mg/L,sulfate 25mg/L and TDS 500mg/L. (GC-2, #36)
    - Unnamed tributary to Flat Creek from EDCC Outfall 001 d/s to confluence with unnamed tributary A to Flat Creek Chloride 23 mg/L, Sulfate 125 mg/L, TDS 475 mg/L, (GC-2, #37)
    - Unnamed tributary A to Flat Creek from mouth of EDCC 001 ditch to confluence with Flat Creek,Chloride 16 mg/L, Sulfate 80 mg/L, TDS 315 mg/L, (GC-2, #38)

Loutre Creek from Hwy 15 South to the confluence of Bayou de Loutre Chloride, 256mg/l; Sulfate 997mg/l, TDS, 1756* (GC-3. #41)

Bayou de Loutre from Loutre Creek to the discharge for the City of El Dorado South facility Chloride, 264mg/l; Sulfate 635mg/l, TDS, 1236* (GC-3. #42)

Bayou de Loutre from the discharge from the City of El Dorado-South downstream to the mouth of Gum Creek. Chloride, 250mg/l; Sulfate 431mg/l, TDS, 966 (GC-3. #43)

Bayou de Loutre from the mouth of Gum Creek downstream to the mouth of Boggy Creek Chloride, 250mg/l; Sulfate 345mg/l, TDS, 780 (GC-3. #44)

Bayou de Loutre from the mouth of Boggy Creek downstream to the mouth of Hibank Creek Chloride, 250mg/l; Sulfate 296mg/l, TDS, 750 (GC-3. #45)

Bayou de Loutre from the mouth of Hibank Creek downstream to the mouth of Mill Creek Chloride, 250mg/l; Sulfate 263mg/l, TDS, 750 (GC-3. #46)

Bayou de Loutre from the mouth of Mill Creek downstream to the mouth of Buckaloo Branch Chloride, 250mg/l; Sulfate 237mg/l, TDS, 750 (GC-3. #47)

Bayou de Loutre from the mouth of Buckaloo Branch downstream to the mouth of Bear Creek Chloride, 250mg/l; Sulfate 216mg/l, TDS, 750 (GC-3. #48)

Bayou de Loutre from the mouth of Bear Creek to the final segment of Bayou de Loutre. Chloride, 250mg/l; Sulfate 198mg/l, TDS, 750(GC-3. #49)

Bayou de Loutre (Final Segment) to the Arkansas / Louisiana State Line. Chloride, 250mg/l; Sulfate 171 mg/l, TDS, 750(GC-3. #50)

Justification: Disapproved by EPA ROD dated April 14, 2009.

41. **Revision: Appendix A: D:** Under Site Specific Standards Supported by UAA, revise:
Bayou Meto from mouth to ~~Bayou Two Prairie~~Pulaski/Lonoke county line
Justification: Approved by Arkansas Pollution Control and Ecology Commission Minute Order No. 07-41.

42. **Revision: Appendix A: D:** Remove:
~~Bayou Two Prairie (mouth to Rickey Branch) - chlorides 95 mg/lL; sulfates 45 mg/lL~~
Add:
Bayou Two Prairie (Pulaski/ Lonoke county line to Northern boundary of Smoke Hole Natural Area) - chlorides 95 mg/L; sulfates 45 mg/L (D-3, #42)
Bayou Two Prairie (Southern boundary of Smoke Hole Natural Area to Mouth) - chlorides 95 mg/L; sulfates 45 mg/L (D-3, #42)
Justification: Disapproved by EPA ROD dated August 5, 2008.

43. **Revision: Appendix C:** Revise the name of Appendix C to "Scientific Names of Aquatic Biota"
Justification: The appendix will now have the scientific names of all aquatic biota mentioned in Regulation 2, not just fish.

44. **Revision: Appendix C:** Add the title "SCIENTIFIC NAMES OF KEY AND INDICATOR FISHES" to the first table in Appendix C.
Justification: This table will only contain key and indicator species of fish.

45. **Revision: Appendix C:** Add a table titled "SCIENTIFIC NAMES OF AQUATIC AND SEMI-AQUATIC LIFE FORMS PROTECTED UNDER THE ECOLOGICAL SENSITIVE WATERBODY DESIGNATED USE" to the second table in Appendix C
Justification: This table will contain the scientific names of all aquatic or semi-aquatic biota mentioned in Regulation 2.

46. **Revision: Appendix D:** Replace current Appendix D, with a list of current Extraordinary Resource Waters ("ERWs"), Ecologically Sensitive Waterbodies ("EWSs"), and Natural and Scenic Waterways ("NSWs").
Justification: EPA disapproved the current Appendix D. ADEQ believes that inclusion of a list of all the ERWs, ESWs, and NSWs will be useful for both ADEQ and other agencies and citizens of Arkansas.

Minor Revisions

47. **Revision: Reg. 2.104**: Replace "facility" with "permittee" in the first sentence.
Justification: Clarification of the intent of the section.

48. **Revision: Reg. 2.104**: Revise the last sentence as follows: Compliance must occur at the earliest practicable time,~~; but~~ not to exceed three years from effective date of permit,~~.~~ unless the permittee is completing site specific criteria development or is under a plan approved by the Department, in accordance with Regs. 2.306, 2.308, and the State of Arkansas Continuing Planning Process.
Justification: Clarification of the intent of the section.

49. **Revision: Reg. 2.106:** Remove the definition of "Act".
Justification: Full citations to the Clean Water Act are now included throughout the regulation so the definition is not necessary.

50. **Revision: Reg. 2.106:** Add the definition:
"Aquatic life: The designated use of a waterbody determined by the fish community and other associated aquatic biota."
Justification: "Aquatic life" is proposed to replace "Fisheries."
"Aquatic life" more adequately describes the intent of the designated use and better fits the definition given in Reg. 2.302.

51. **Revision: Reg. 2.106:** Add the definition:
"Bioaccumulation: The process by which a compound is taken up by an aquatic organism, both from water and through food."
Justification: Bioaccumulation is referenced in the regulation, but has not been included in the definitions section.

52. **Revision: Reg. 2.106:** Add the definition; **Conventional pollutants:** Pursuant to section 304(a)(4) of the Clean Water Act, 33 U.S.C. § 1314(a)(4), includes biochemical oxygen demand (BOD), total suspended solids (nonfilterable) (TSS), pH, fecal coliform, and oil and grease.
Justification: Conventional pollutant is referenced in the regulation, but has not been included in the

definitions section.

53. **Revision: Reg. 2.106:** Add the definitions:
"Criterion continuous concentration (CCC): An estimate of the highest concentration of a material in ambient water to which an aquatic community can be *exposed indefinitely* without resulting in an unacceptable adverse effect. This is the chronic criterion.

Criterion maximum concentration (CMC): An estimate of the highest concentration of a material in ambient water to which an aquatic community can be *exposed briefly* without resulting in an unacceptable adverse effect. This is the acute criterion."
Justification: Criterion Continuous Concentration and Criterion Maximum Concentration are referenced in the regulation, but have not been included in the definitions section.

54. **Revision: Reg. 2.106:** Remove the definition "Fishery."
Justification: This definition is proposed to be replaced with "Aquatic life." Aquatic life" more adequately describes the intent of the designated use and better fits the definition given in Reg. 2.302.

55. **Revision: Reg. 2.106:** Add the definition:
"Groundwater: Water below the land surface in a zone of saturation."
Justification: This is the definition of ground water provided in APC&EC Regulations 17, 22, and 23 and federal regulations at 40 C.F.R. §§ 146.3 and 270.2, . The Safe Drinking Water Act, and Resource Conservation and Recovery Act also use this definition.

56. **Revision: Reg. 2.106:** Revise the definition:
"**Headwater:** The upper watershed area where streams generally begin; typically consists of 1st- and 2nd-order streams."
Justification: This definition is consistent with the EPA definition.

57. **Revision: Reg.2.106:** Revise the definition of "Nonpoint source" to:
"Nonpoint source: A contributing factor to water pollution that is not confined to an end-of-the-pipe discharge, i.e., stormwater runoff not regulated under Clean Water Act § 402(p), 33 U.S.C. § 1342, agricultural or silvicultural runoff, irrigation return flows, and other sources of diffuse runoff."
Justification: EPA suggestion to clarify definition to include a reference to the Clean Water Act.

58. **Revision: Reg. 2.302**: Add text "(For specific listings refer to Appendices A and D)" to sections (A), (B), and (C).
Justification: This provides a reference to the listings for specific designated uses.

59. **Revision: Reg. 2.311(A)(8)**: Revise to read: "Supporting documentation for the designation, including information which addresses the factors listed in Appendix F."
Justification: All articles in Appendix F must be met; there is no need to list them.

60. **Revision: Reg. 2.401:** Add "Unless otherwise designated in this chapter and in Appendix A" as the first sentence.

Justification: To clarify that some general standards may not apply to every waterbody due to water quality standards variations supported by a use attainability analysis.

61. **Revision: Reg. 2.405:** In the second paragraph, replace "variety and abundance" with "habitat and hydrologic condition." Remove the second sentence. Revise the forth sentence to read "It is the responsibility of the Department to evaluate the data for an aquatic biota assessment when appropriate to protect aquatic life uses designated in Appendix A. Such data may be used to develop permit effluent limitations or conditions."
Justification: EPA suggestion, to clarify the circumstances for aquatic biota assessments.

62. **Revision: Reg. 2.501:** Add, "Unless otherwise designated in this chapter and in Appendix A" as the first sentence.
Justification: To clarify that some specific standards may not apply to every waterbody due to water quality standards variations supported by a use attainability analysis.

63. **Revision: Reg. 2.503:** Remove "ambient" from the third sentence of the first paragraph.
Justification: Current wording limits the data that can be used to assess turbidity.

64. **Revision: Reg. 2.504:** Revise to read:
"pH between 6.0 and 9.0 standard units are the applicable standards for streams. For lakes, the standards are applicable at 1.0 meter depth. As a result of waste discharges, the pH of water in streams or lakes must not fluctuate in excess of 1.0 standard unit over a period of 24 hours. No mixing zones are allowed for pH. Standards are applicable to all waters of the state, except in those waterbodies where natural background conditions result in pH values either less than or greater than the criteria listed above."
Justification: Easier to interpret.

65. **Revision: Reg. 2.505**: Place the table before the text.
Justification: Easier flow of information.

66. **Revision: Reg. 2.509**: Add section heading "(A)" to the first paragraph and "(B)" to "Site Specific Nutrient Criteria."
Justification: Separating narrative general standard from site specific nutrient standards.

67. **Revision: Reg. 2.511(A)**: Regarding the Arkansas River, replace "Mouth to L&D #7" with "Mouth to Murray Lock and Dam [L&D #7]".
Justification: Adding the dam's common name will make the stream reach description easier to interpret.

68. **Revision: Reg. 2.511(A)**: Regarding the Arkansas River, replace "L&D #7 to L&D #10" with "Murray Lock and Dam [L&D #7] to Dardanelle Lock and Dam [L&D #10]".
Justification: Adding the dam's common name will make the stream reach description easier to interpret.

69. **Revision: Reg. 2.511(A):** Regarding the Arkansas River, replace "L&D #10 to Oklahoma line,

including Dardanelle Reservoir" with "Dardanelle Lock and Dam [L&D #10] to Oklahoma line, including Dardanelle Reservoir."
Justification: Adding the dam's common name will make the stream reach description easier to interpret.

70. **Revision: Reg. 2.511(A):** Revise Stennitt Creek to say "Stennitt Creek from Brushy Creek to Spring River."
Justification: This creek is listed as "Stennitt Creek- from Brushy Creek to Spring River, TDS=456 mg/l (OH-4, #6)'' in the variation supported by UAA list in Appendix A.

71. **Revision: Reg. 2.511(C):** Add an "s" to the end of "Reg." and "and 2.308" after 2.306.
Justification: Clarification that both Reg. 2.306 and 2.308 apply when mineral concentrations exceed Domestic Water Supply designated use criteria.

72. **Revision: Appendix A:** Add a table of contents for the ecoregions.
Justification: This will increase the user friendly nature of the appendix.

73. **Revision: Appendix A:** Throughout Appendix A, replace "Site Specific Use Variations Supported by UAA" headings with "Designated Use Variations Supported by Use Attainability Analysis." Replace "Variations Supported by UAA" headings with "Site Specific Standards Variations Supported by " for each Appendix A ecoregion.
Justification: The added language will help clarify the difference between designated use variations and specific standard variations supported by UAAs.

74. **Revision: Appendix A**: On each Designated Uses ecoregion page - Add two asterisks (**) to Primary Contact Recreation; Secondary Contact Recreation; Domestic, Industrial and Agricultural Water Supply; and Aquatic Life headings. Also add footnote "**Except for those waters with designated use variations supported by UAA or other investigations."
Justification: To clarify that all designated uses do not apply to all waters.

75. **Revision: Appendix A: OH:** Add Little Strawberry River to ERW and ESW lists for Ozark Highlands Ecoregion.
Justification: This river is designated on the corresponding plate (OH-3) as an ERW and ESW and has been since the 1988 version of Reg. No. 2.

76. **Revision: Appendix A: OH:** Add "Cave Springs Cave, Logan Cave, and n..." to ESW list.
Justification: These caves are already designated on the corresponding plates, adding their names will highlight the fact that they are protected.

77. **Revision: Appendix A: OH:** Add Rock Creek to ESW list for Ozark Highlands Ecoregion.
Justification: This creek is designated on the corresponding plate (OH-4) as an ESW and has been since the 1988 version of Reg No. 2.

78. **Revision: Appendix A: OH:** Designated Use Variations Supported...Section, add #6 to Stennitt Creek after OH-4.
Justification: #6 corresponds to the number representing the location on the following plate.

79. **Revision: Appendix A: BM:** Revise the first entry in the ERW section:
"Middle and Devils Forks of the Little Red River including Beech Creek, Tomahawk Creek, Turkey Creek, Lick Creek, Raccoon Creek, and Little Raccoon Creek (BM-2, BM-3)"
This
Justification: Little Raccoon Creek is designated on the corresponding plate (BM-3) as an ERW and ESW and has been since the 1988 version of Reg. No. 2. Raccoon Creek is the correct spelling of this creek.

80. **Revision: Appendix A: BM:** Revise the first entry in the ESW section:
Middle, South, and Devils Forks of Little Red River including Beech Creek, Tomahawk Creek, Turkey Creek, Lick Creek, Raccoon Creek, Little Raccoon Creek, and Archey Creek above Greers Ferry Reservoir - location of endemic yellowcheek darter, endangered speckled pocketbook mussel, and scaleshell (except Devils Fork) (BM-2, BM-3)
Justification: Little Raccoon, Beech, Tomahawk, Turkey, and Lick Creeks are designated on the corresponding plate (BM-3) as an ERW and ESW and has been since the 1988 version of Reg. No. 2. The new format is succinct and easier to read.

81. **Revision: Appendix A: ARV:** Under the Ecologically Sensitive Waterbodies heading add "None."
Justification: The current version of Reg. No. 2 has nothing listed under the ESW heading. Adding "None" will clarify that there are no ESWs in the Arkansas River Valley Ecoregion.

82. **Revision: Appendix A: GC:** Add "springwater influenced" to "All sizes" in Dissolved Oxygen Table.
Justification: Reg. 2.505 Dissolved Oxygen (page 5-4) states limits for < 10, 10 – 500, > 500, *and* springwater- influenced streams in the Gulf Coastal ecoregion. As the table on page A-30 is currently written it appears the "All sizes" limits would trump the other 3, this is incorrect.

83. **Revision: Appendix A: D**: Revise line three under the ERW heading: Norrell Lock and Dam (Dam #2).
Justification: Adding the dam's common name will make the stream reach description easier to interpret.

84. **Revision: Appendix C:** Revise the scientific names for the Blacktail shiner, Bluntnose darter, Gravel chub, Pugnose minnow, Striped shiner, and Whitetail shiner
Justification: As per Nelson, J. S., Crossman, E. J., Espinosa-Pérez, H., Findley, L. T., Gilbert, C. R., Lea, R. N., Williams, J. D. 2004. Common and scientific names of fishes from the United States, Canada and Mexico. 6th edition. American Fisheries Society, Bethesda, Maryland. ix,386 p.

85. **Revision: Appendix C:** Revise the scientific name for the Southern redbelly dace.
Justification: As per Strange, R. M., and R. L. Mayden. 2009. Phylogenetic Relationships and a

Revised Taxonomy for North American Cyprinids Currently Assigned to Phoxinus (Osteichthyes: Cyprinidae). Copeia 2009 (3):494-501.

Grammatical and Typos. The following list is intended to list every amendment related to grammatical and typographical errors. The list also attempts to list each instance where the regulation has been amended to conform to the APC&EC Regulation Formatting and Drafting Guidelines. However, due to the size of this regulation, all changes may not be included in this list.

86. **Revision:** Remove the wording "Adopted by…(August 26, 2011)," add "Initial Draft."
Justification: The current 2013 Regulation No. 2 is in draft form. The cover of the final 2013 Reg. No. 2 will include the latest adoption date.

87. **Revision:** Throughout regulation, any place other than the front title page, remove the existing adoption date.
Justification: The adoption date on the front cover is sufficient to cover the entire regulation document. There is no legal basis to have adoption dates on appendices.

88. **Revision: page 1-1:** Add an "s" at the end of "standard."
Justification: Typo

89. **Revision:** Throughout regulation replace "mg/l," "µg/l" and "ng/l," with "mg/L," "µg/L" and "ng/L," respectively.
Justification: The standard abbreviation for milligrams per liter is mg/L; µg/L is the standard abbreviation for micrograms per liter; and ng/L is the standard abbreviation for nanograms per liter.

90. **Revision:** Throughout regulation capitalize "Extraordinary Resource Waters, Ecologically Sensitive Waterbodies, and Natural and Scenic Waterways".
Justification: Standardization of text.

91. **Revision:** Throughout regulation replace CFS with cfs.
Justification: Standardization of text.

92. **Revision:** Throughout regulation replace "aquatic life" with "aquatic biota".
Justification: The term "aquatic life" is not defined in the document, "aquatic biota" is.
Use of the term "aquatic biota" will help differentiate between the aquatic life designated use and plant and animal life found in aquatic systems.

93. Revision: Throughout regulation replace "Cr." with "creek".
Justification: Standardization of text.

94. **Revision:** Throughout Appendix A replace "TDS" with "total dissolved solids"
Justification: Standardization of text.

95. **Revision:** Throughout Appendix A replace "tributary" with "trib."
Justification: Standardization of text.

96. **Revision:** Throughout entire regulation replace "ADEQ" with "Department."
Justification: Reg. 2.104 states that the Arkansas Department of Environmental Quality will thereafter be referred to as the "Department" in the document.

97. **Revision:** Throughout entire regulation replace "D.O." with "dissolved oxygen".
Justification: Standardization of text.

98. **Revision:** Throughout entire regulation add the appropriate state name before "state line" or the appropriate count name before "county line." Example: "from mouth to Louisiana state line."
Justification: Clarification.

99. **Revision:** Throughout entire regulation add the word "state" or "county" in front of "line" in reference to a state or county boundary. Example: Missouri state line.
Justification: Clarification.

100. **Revision:** Throughout entire regulation replace "Brdg" with "Bridge."
Justification: Standardization of text.

101. **Revision:** Throughout entire regulation, replace the acronym "UAA" with "Use Attainability Analysis," except for the plate legends in Appendix A (based on available space).
Justification: Required by "REGULATION FORMATTING AND DRAFTING GUIDELINES."

102. **Revision: Reg 2.102:** Second sentence, add comma after "value."
Justification: Typo.

103. **Revision: Reg 2.104:** Add text: "Arkansas" Department "of Environmental Quality (hereinafter referred to as "Department")."
Justification: Proper reference to the Arkansas Department of Environmental Quality.

104. **Revision: Reg 2.104**: Add text "National Pollutant Discharge Elimination System" and place NPDES in parenthesis.
Justification: Defining NPDES acronym for clarification.

105. **Revision: Reg. 2.106:** Bold defined words.
Justification: Required by "REGULATION FORMATTING AND DRAFTING GUIDELINES."

106. **Revision: Reg. 2.106:** Replace uppercase first letter of second and subsequent words with a lower case letter.
Justification: Standardization of text.

107. **Revision: Reg. 2.106:** In 304(a) guidance definition, add ", 33 U.S.C. § 1251 *et seq*." after "Clean Water Act.
Justification: To provide a more accurate reference to the legal codes and acts.

108. **Revision: Reg. 2.106:** Add "United States" in front of "Environmental Protection Agency" (and throughout the Regulation.
Justification: Standardization of text.

109. **Revision: Reg. 2.106:** Add a period to the end of definitions for "Act" and "Design flow."
Justification: EPA suggestion, typos.

110. **Revision: Reg. 2.106:** In "Algae" definition, add a comma after the word "stems" and replace "which" with "that."
Justification: Both changes are to correct grammatical errors.

111. **Revision: Reg. 2.106:** Remove "Continuing Planning Process" definition.
Justification: Proper reference of the document is the "State of Arkansas Continuing Planning Process" and it will be defined under that title.

112. **Revision: Reg 2.106:** Revise first inset sentence of "Critical flows" definition to include the text "cubic foot per second" and place cfs in parenthesis.
Justification: Defining cfs acronym for clarification.

113. **Revision: Reg. 2.106:** Revise "Department" definition to read "Department: The Arkansas Department of Environmental Quality, or its successor."
Justification: Required by "REGULATION FORMATTING AND DRAFTING GUIDELINES."

114. **Revision: Reg. 2.106:** In *Escherichia coli* revise the "A" to lower case at the beginning of the definition.
Justification: Standardization of definition formatting.

115. **Revision: Reg. 2.106:** In the "Existing uses" definition, and throughout the rest of the regulation, add "Clean Water" in front of "Act".
Justification: Clarification of the reference and standardization of text.

116. **Revision: Reg. 2.106:** In the "Mixing zone" definition, remove the comma and "(ZID)" acronym. ZID acronym also removed from Reg. 2.508.
Justification: The comma is a grammatical error and the ZID acronym is removed based upon the "REGULATION FORMATTING AND DRAFTING GUIDELINES."

117. **Revision: Reg. 2.106:** Remove the parenthesis from "Nephelometric Turbidity Unit" and follow with NTU in parenthesis (NTU). Format "Jackson Turbidity Units" and Formazin Turbidity Units in the same manner.
Justification: Proper formatting.

118. **Revision: Reg. 2.106:** Move Q7-10 definition to follow "Primary season" definition.
Justification: Q7-10 definition is not in alphabetical order.

119. **Revision: Reg. 2.106:** Revise "Seasonal fishery" to "Seasonal Aquatic Life." Also replace "fishery" with "aquatic life" within the text of the definition.
Justification: It is proposed to replace the designated use "fishery" with "aquatic life."

120. **Revision: Reg. 2.106:** Add "State of Arkansas Continuing Planning Process" definition.
Justification: Formerly defined as "Continuing Planning Process." The new definition provides proper reference of the document.

121. **Revision: Reg. 2.106:** Capitalize "state" in waterbodies, waterways, and waters definition.
Justification: Typo.

122. **Revision: Reg. 2.202:** Remove "...State's continuing planning process.." wording and replace with "State of Arkansas's Continuing Planning Process." Scan document and change all references to "State of Arkansas's Continuing Planning Process."
Justification: Proper reference of the document.

123. **Revision: Reg. 2.203:** Replace "ERW" with "Extraordinary Resource Waters" and place "ERW" in parenthesis.
Justification: Defining ERW acronym for clarification.

124. **Revision: Reg. 2.302**: Under Fisheries heading, capitalize the first word after the hyphen in sections (1), (2), and (3).
Justification: Standardization of text.

125. **Revision: Reg. 2.303**: Replace "EPA" with "U.S. Environmental Protection Agency" and place "EPA" in parenthesis.
Justification: Defining EPA acronym for clarification.

126. **Revision: Reg. 2.303**: Remove "CPP" acronym.
Justification: The acronym is not used elsewhere in the document and is therefore unnecessary.

127. **Revision: Reg. 2.308:** spell out the acronym for WER – water effects ratio
Justification: Defining WER acronym for clarification.

128. **Revision: Reg. 2.310:** In the title, replace the capitalized "A" with a lowercase "a."
Justification: Typo.

129. **Revision: Reg. 2.404:** In second paragraph, remove the commas that come before and after the information in parenthesis (this occurs twice in the paragraph).
Justification: Grammatical errors.

130. **Revision: Reg. 2.501:** Insert coma after "...on occasion."
Justification: Typo.

131. **Revision: Reg. 2.502:** Add a space between St. and Francis in the "streams" list.
Justification: Typo.

132. **Revision: Reg. 2.505:** Replace "state's continuing planning process" with "State of Arkansas Continuing Planning Process."
Justification: Standardization of document.

133. **Revision: Reg. 2.505**: Replace the "#" symbol with "No." in Regulation No. 6 reference.
Justification: Standardization of text.

134. **Revision: Reg. 2.508:** Remove the space between "non" and "permit."
Justification: Typo

135. **Revision: Reg. 2.508:** Remove NOECs acronym.
Justification: The acronym is not used elsewhere in the document and is therefore unnecessary.

136. **Revision: Reg. 2.508:** Revise the first foot note to read "These values may be adjusted by a site specific Water-Effects Ratio as defined in 40 CFR Part 131.36 (c)."
Justification: The acronym "WER" does not need to be included, it does not occur anywhere else in the document. The first #1 was inadvertently left off of "Part 131.36 (c)."

137. **Revision: Reg. 2.508:** Remove the "**" footnote marker from the first column for Mercury in the Dissolved Metals table.
Justification: Clarify that acute criteria are not expressed as total recoverable.

138. **Revision: Reg. 2.508:** Add the footnote marker "‡" to Mercury in the Dissolved Metals table. Add the foot note, "‡ Mercury based on bioaccumulation of residues in aquatic organisms." Remove "Mercury based on bioaccumulation of residues in aquatic organisms, rather than toxicity" from the existing "**" footnote.
Justification: Clarification

139. **Revision: Reg. 2.508:** Under "Human Health Criteria" revise second footnote to read "4000 ng/L is also represented as 4.0 ug/L, which is the maximum contaminant level under…"
Justification: The "M" in "maximum" does not need to be capitalized, it is a typo. Also, the acronym "MCL" does not need to be included, it is not used anywhere else in the document.

140. **Revision: Reg. 2.509**: In last sentence of first paragraph, remove the comma between "established, numeric."
Justification: Grammatical error.

141. **Revision: Reg. 2.509** In the second sentence replace "are" with "is."
Justification: Grammatical error.

142. **Revision: Reg. 2.511(A)**: Add element names to the minerals table.
Justification: The atomic symbols for chloride and sulfate has not been defined, nor has the acronym TDS, at this point in the document.

143. **Revision: Reg. 2.511(A)**: Remove the asterisks (*) from the chloride and TDS criteria for Walker Branch.
Justification: The asterisks were inadvertently added in the 2007 version of Reg. No. 2.

144. **Revision: Reg. 2.511(A)**: Under Ouachita River (Louisiana line to Camden), replace capital "R" with lower case "r" for Hurricane Creek from Hwy 270 to Saline River in table.

Hurricane C~~R~~r from Hwy 270 to Saline River	100	500	1000

Justification: Typo.

145. **Revision: Reg. 2.512(B):** In the tables, remove the comma between "temperature" and "°C."
Justification: Typos.

146. **Revision: Reg. 2.512(B):** Replace "ELS" with "Early Life Stage."
Justification: Defining acronym for clarification

147. **Revision: Reg. 2.512(D):** Remove the number 7 and spell it out in "seven-day average."
Justification: Bring consistency to "seven-day average" and "four-day average," which is used later in the sentence.

148. **Revision: Appendix A:** Restart numbering of pages after page A-2.
Justification: Currently there are 2 pages numbered A-2.

149. **Revision: Appendix A: BM:** Add "Big" to Piney Creek in ERW list for Boston Mountains ecoregion.
Justification: This creek is labeled Big Piney Creek in the NSW list and in the NHD data.

150. **Revision: Appendix A: ARV :**Under Designated Use Variations Supported by UAA, add a space between the word "use" and the parentheses for both entries.
Justification: Typos.

151. **Revision: Appendix A: OM:** Standardize the spelling of "Arkansas fatmucket mussel" in ESW list.
Justification: "Arkansas fatmucket mussel" is the correct spelling.

152. **Revision: Appendix A: GC:** Replace "(GC-3)" with "(GC-2)" for Moro Creek under the ERW heading.
Justification: Typo

153. **Revision: Appendix A: GC:** Replace "(GC-2)" with "(GC-4)" for Ouachita River near Arkadelphia under the ESW heading.
Justification: Typo

154. **Revision: Appendix A: GC:** Move "Lower Little" to next line in ESW descriptions.
Justification: Current placement of the word "Lower Little" gives the impression that it goes with Grassy Lake and Yellow Creek. This is incorrect; it should be Lower Little Missouri River.

155. **Revision: Appendix A: GC:** Add "(GC-2, #28)" after "Dismukes Creek and Big Creek to Bayou Dorcheat – no domestic water supply."
Justification: Inadvertently omitted from previous versions.

156. **Revision: Appendix A: GC:** Add "(GC-2, #51)" after "Boggy Creek from the discharge from Clean Harbors El Dorado LCC downstream to the confluence of Bayou de Loutre - no domestic water supply use."
Justification: Inadvertently omitted from previous versions.

157. **Revision: Appendix A: GC:** Under Designated Use Variations Supported by UAA, add a space between the word "use" and the parentheses for multiple entries.
Justification: Typos.

158. **Revision: Appendix A: GC:** Move the numbers 6 and 5 (next to "All sizes") into the column below the "Spring Water Streams" heading.
Justification: Typo.

159. **Revision: Appendix A: D:** Add plate numbers and corresponding UAA map numbers (#38-41) to the "Variations Supported by UAA" list. (See Bayou Meto Water District UAA) [Ex:(D-3, #29)]
Justification: These numbers are labeled on Plate D-3, but were left off most of the listings.

160. **Revision: Appendix A: D:** Label ESWs on Plate D-2 using legend symbols.
Justification: The ESW delineations appear to have been inadvertently left off when the variations by UAA were added to the plate.

161. **Revision: Appendix A: D:** Replace "Lagrue Bayou" with "LaGrue Bayou."
Justification: LaGrue Bayou is the correct spelling.

162. **Revision: Appendix E:** Replace "Section" with "Reg." in second paragraph.
Justification: Proper reference to Reg 2.310.

163. **Revision: Appendix E:** Replace "7Q10" with "Q710" under part (V).
Justification: Proper reference of Q710.

Attachment 2

AEDC Small Business

Economic Impact Statement

ECONOMIC IMPACT STATEMENT
OF PROPOSED RULES OR REGULATIONS
EO 05-04 and Act 143 of 2007: Regulatory Flexibility

Department Arkansas Department of Environmental Quality

Divisions Water Division

Contact Person Jamie Ewing Date January 29, 2013

Contact Phone 501-682-0918 Contact Email ewing@adeq.state.ar.us

Title or Subject: Arkansas Pollution Control and Ecology Commission Regulation Number 2, Regulation Establishing Water Quality Standards for Surface Waters of the State of Arkansas

Benefits of the Proposed Rule or Regulation

ADEQ believes that, in addition to that specific answers that follow, the AEDC would be assisted in analyzing this rule with a copy of the Economic Impact/Environmental Benefit Analysis completed by ADEQ for the Arkansas Pollution Control and Ecology Commission pursuant to APC&EC Reg. 8.812. A copy of the "EI/EB Analysis" form in its entirety is attached to this questionnaire as Attachment 1.

1. Explain the need for the proposed change(s). Did any complaints motivate you to pursue regulatory action? If so, Please explain the nature of such complaints.

Pursuant to the Federal Water Pollution Control Act ("Clean Water Act"), 33 U.S.C. §1251 et seq., Arkansas has been delegated the authority to establish and administer water quality standard. The water quality standards are administered through the Arkansas Water and Air Pollution Control Act, Ark. Code Ann. §8-4-101 et seq. The Clean Water Act requires states to review their water quality standards on a triennial basis and to amend those standards as necessary. This proposed rule is the result of that process. The proposed changes are necessary to ensure that waters of the State are maintained and protected, in accordance with the Clean Water Act and the Arkansas Water and Air Pollution Control Act. See Section 2A of Attachment 1 for specific data regarding the benefit of protecting water quality in Arkansas (pages 4-6).

Many of the changes proposed in this rulemaking are intended to clarify the regulation through formatting changes or grammatical revisions. Also, several revisions are proposed to comply with the Arkansas Pollution Control and Ecology Commission's Regulation Drafting Guidelines.

2. What are the top three benefits of the proposed rule or regulation?

The responses to questions 1 and 2, Section 2B of Attachment 1 (pages 22-27) provide information regarding the specific benefits of each proposed change. In general, the primary benefits of this proposed rule is to remain in compliance with federal law regarding the promulgation of water quality standards and providing protection to the surface waters that support industry and recreation in the State of Arkansas.

3. What, in your estimation, would be the consequence of taking no action, thereby maintaining the status quo?

Some of the proposed changes, such as the addition of numeric nutrient criteria for Beaver Lake are necessary protect water quality of a significant surface water of the State of Arkansas. Other changes are necessary to prevent confusion to the public or regulated entities that rely on the regulation. See the responses to question 3, Section 2B of Attachment 1 (pages 27-30).

4. Describe market-based alternatives or voluntary standards that were considered in place of the proposed regulation and state the reason(s) for not selecting those alternatives.

In order to comply with federal law, there are no market-based alternatives or voluntary standards that could be considered in place of the proposed regulation.

Impact of Proposed Rule or Regulation

5. Estimate the cost to state government of *collecting information, completing paperwork, filing recordkeeping, auditing and inspecting* associated with this new rule or regulation.

See responses to questions 2, 4 and 5 of Section 2A of Exhibit 1 (pages 14-21). For each proposed change, the Department has estimated costs of implementation.

6. What types of small businesses will be required to comply with the proposed rule or regulation? Please estimate the number of small businesses affected.

Any small business that might conduct an activity that would impact a water of the State would be required to comply with the proposed rule, not just those that receive permits from ADEQ. It is nearly impossible to estimate a number of small businesses affected as ADEQ does not have data regarding the number of employees from each affected entity.

7. Does the proposed regulation create barriers to entry? If so, please describe those barriers and why those barriers are necessary.

The proposed regulation may create barriers to entry that are necessary to protect water quality. For some waters, the costs of treatment to protect extraordinary water quality will prevent the entry of a facility in that area. This is necessary to comply with the federal Clean Water Act, which prohibits the degradation of existing water quality.

8. Explain the additional requirements with which small business owners will have to comply and estimate the costs associated with compliance.

There are no additional requirements on small business owners; all sized businesses must comply with the same water quality standards. See Attachment 1 for cost estimates.

9. State whether the proposed regulation contains different requirements for different sized entities, and explain why this is, or is not, necessary.

All sized entities must comply with the same rules.

10. Describe your understanding of the ability of small business owners to implement changes required by the proposed regulation.

ADEQ believes the small business owners can implement the changes required by the regulation. Additionally, ADEQ proposes changes to APC&EC Reg.2.104 to allow for more flexibility regarding ongoing compliance with the regulation.

11. How does this rule or regulation compare to similar rules and regulations in other states or the federal government?

The general standards within the regulation are very similar to rules from other states or recommended by the federal government. Specific standards may be based on site-specific or ecoregion-based data but are generally similar to standards adopted in other states.

12. Provide a summary of the input your agency has received from small business or small business advocates about the proposed rule or regulation.

ADEQ held a series of stakeholder workgroup meetings to discuss the overall structure of the Triennial Review and specific changes to the regulation. Representatives from groups such as the Arkansas Environmental Federation (industry advocates), Arkansas Farm Bureau, and Arkansas Municipal League participated in the workgroups. The workgroup process lasted for several months and included a total of six (6) meetings, with three (3) subgroup meetings regarding specific standards, such as for minerals.

Attachment 3

Economic Impact/Environmental Benefit Analysis

Pursuant to Arkansas Pollution Control and Ecology Commission Reg.8.812

ECONOMIC IMPACT/ENVIRONMENTAL BENEFIT ANALYSIS

Answer to best of the proponent's ability, as required by APC&EC Regulation 8.812

STEP 1: DETERMINATION OF ANALYSIS REQUIREMENT
(to be included in petition to initiate rulemaking)

The Arkansas Pollution Control and Ecology Commission's (Commission) Regulation No. 8 requires the Commission to duly consider the economic impact and the environmental benefit of any rule or regulation prior to promulgation. By Act 143 of 2007, the Governor has directed that impacts to small businesses be analyzed prior to adoption of regulations. Furthermore, the Arkansas Legislative Council requires the submission of a Financial Impact Statement and Questionnaire for Filing Proposed Rules and Regulations with the Arkansas Legislative Council and Joint Interim Committee with proposed regulation changes. The following procedures are outlined to provide clarity in the requirements of these various impact statements.

1. Prepare and submit the Financial Impact Statement and Questionnaire for Filing Proposed Rules and Regulations with the Arkansas Legislative Council and Joint Interim Committee required by the Arkansas Legislative Council for all proposed rulemakings.

2. The following analysis is necessary for the Commission to consider the economic impact and environmental benefit of any proposed rule or regulation. This Economic Impact/ Environmental Benefit Analysis ("Analysis") must be prepared by the proponent of the rulemaking initiated before the Commission based upon information reasonably available. If a rulemaking proposes to alter or amend an existing Commission rule, the Analysis shall be restricted to the economic impact and environmental benefits of the proposed changes. This Analysis must be included in the Petition to Initiate Rulemaking before the Commission for all regulatory changes, unless the proposed rule is exempt for one or more of the following reasons:

- The proposed rule incorporates or adopts the language of a federal statute or regulation without substantive change;*
- The proposed rule incorporates or adopts the language of an Arkansas state statute or regulation without substantive change;
- The proposed rule is limited to matters arising under Regulation No. 8 regarding the rules of practice or procedure before the Commission;
- The proposed rule makes only *de minimis* changes to existing rules or regulations, such as the correction of typographical errors or the renumbering of paragraphs or sections; or
- The proposed rule is an emergency rule that is temporary in duration.

If the proposed rulemaking does not require the following Analysis due to one or more of the exemptions listed above, state in the Petition to Initiate Rulemaking which exemptions apply and explain specifically why each is applicable.

**If a proposed rule incorporates or adopts the language of a state or federal statute or regulation but does include one or more substantive change, then the Analysis shall address only the substantive changes.*

STEP 2: THE ANALYSIS
(to be included in petition to initiate rulemaking, if required)

Directions for Analysis Completion:

1. Answer all questions, unless an exemption applies, using information reasonably available.
2. List source(s) for any data used in an answer. If a response cannot be provided to any question because information is not reasonably available, describe the sources consulted or steps taken in an effort to obtain the information in question.
3. Describe any assumptions used.
4. Complete the Economic Impact Statement, if applicable, as required by Act 143 of 2007.
5. Highlight on the attached map the boundary of the geographical area impacted by the proposed rule, unless the proposed rule applies to the entire state.

This Analysis shall be available for public review along with the proposed rule in the public comment period. The Commission shall compile a response to comments demonstrating a reasoned evaluation of the relative economic impact and environmental benefits.

ARKANSAS POLLUTION CONTROL & ECOLOGY COMMISSION
ECONOMIC IMPACT/ENVIRONMENTAL BENEFIT ANALYSIS

Rule Number & Title: Regulation No. 2, Regulation Establishing Water Quality Standards for Surface Waters of the State of Arkansas

Petitioner: Arkansas Department of Environmental Quality

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Jamie Ewing, Attorney Specialist, Legal Division

Analysis Prepared by: Water Quality Planning Branch, Water Division, ADEQ

Date Analysis Prepared: January 29, 2013

Pursuant to APC&EC Reg.8.812(A)(4), the following Regulations are exempt from this economic impact and environmental benefit analysis (hereinafter "Analysis") because "the proposed rule makes only *de minimis* changes to existing rules or regulations, such as the correction of typographical errors or the renumbering of paragraphs or sections":

Reg. 2.101 Authority
Reg. 2.105 Environmental Improvement Projects
Reg. 2.106 Definitions

- ***a)*** All defined words were bolded for uniformity.
- ***b)*** Definitions for: 304(a) guidance, algae, all flows, base flows, chronic toxicity, department, design flow, designated uses, *Escherichia coli*, existing uses, fishable/swimmable, human health criteria, long term average flow, milligrams per liter, mixing zone, nephelometric turbidity unit (NTU) (previously NTU (Nephelometric Turbidity Unit), primary season critical flow, Q7-10, State of Arkansas Continuing Planning Process (previously Continuing Planning Process (CPP)), waterbodies, waterways, waters, water effects ratio (WER), and zone of initial dilution (ZID)

Reg. 2.202 High Quality Waters
Reg. 2.203 Outstanding Resource Waters
Reg. 2.204 Thermal Discharges
Reg. 2.303 Use Attainability Analysis
Reg. 2.306 Procedures for Removal of Any Designated Use Except Fishable/Swimmable...
Reg. 2.308 Site Specific Criteria
Reg. 2.309 Temporary Variance
Reg. 2.310 Procedure for the Removal of the Designated Use of Extraordinary Resource...
Reg. 2.311 Procedure for the Addition of the Designate Use of Extraordinary Resource...
Reg. 2.403 Methods
Appendix E
Appendix B
Appendix F

Amendments to the following Regulations are not exempt from this Analysis and are analyzed below:

Reg. 2.104 Policy for Compliance
Reg. 2.106 Definitions
Definitions for: aquatic life (previously fisheries), bioaccumulation, conventional pollutants, criterion continuous concentration (CCC), criterion maximum concentration (CMC), critical flows, groundwater, harmonic mean flow, headwater, natural background, nonpoint source, and seasonal aquatic life
Reg. 2.302 Designated Uses
Reg. 2.304 Physical Alteration of Habitat
Reg. 2.401 Applicability
Reg. 2.402 Nuisance Species
Reg. 2.404 Mixing Zones
Reg. 2.405 Biological Integrity
Reg. 2.409 Toxic Substances
Reg. 2.501 Applicability
Reg. 2.502 Temperature
Reg. 2.503 Turbidity
Reg. 2.504 pH
Reg. 2.505 Dissolved Oxygen
Reg. 2.507 Bacteria
Reg. 2.508 Toxic Substances
Reg. 2.509 Nutrients
Reg. 2.510 Oil and Grease
Reg. 2.511 (A) Mineral Quality
Reg. 2.511 (B) Mineral Quality
Reg. 2.511 (C) Mineral Quality
Reg. 2.512 Ammonia
Appendix A – Designated Uses, Specific Standards and Maps of Waters of the State...
Appendix C – Scientific Names of Aquatic Biota
Appendix D – List of Current Extraordinary Resource Waters, Ecologically Sensitive...

2A. ECONOMIC IMPACT

1. Who will be affected economically by this proposed rule?
State: a) the specific public and/or private entities affected by this rulemaking, indicating for each category if it is a positive or negative economic effect; and b) provide the estimated number of entities affected by this proposed rule.
In general, these proposed water quality standards revisions will have a positive economic effect on Arkansas's public and private industry, tourism, and recreational and domestic water suppliers by offering continued protection of the State's water resources. Arkansas has approximately one-half million acres of surface water, with some 13,490 miles of streams and rivers and more than 500,000 acres of lakes. As per the 2012 Integrated Water Quality Monitoring and Assessment Report (305(b)), over 62% of Arkansas's assessed surface waters are fully supporting their designated uses (Table 1).

Table 1. Designated Use & Water Quality Standards Support in Arkansas

Degree of Use Support	Assessed Total (miles)	Percentage
Supporting all assessed uses	6168.7	62.75%
Not supporting a use	3661.2	37.25%
Total Waters Assessed	9829.9	

Economic Earnings from Clean Water

The benefits of implementing the Clean Water Act are numerous. Recreational, industrial, and municipal uses are all dependent upon clean, safe water. A conservative estimate of the benefit of implementing the Clean Water Act and thus achieving high quality water, can be made by subtracting fishing from the Agriculture, Forest, and Fishing category, and considering a marginal value of 10 percent (10%) for high quality water. This estimate is used in the calculations below.

Tourism and Recreation

Over $5.5 billion in revenue was generated for the State of Arkansas in 2010 through tourism. The conservative estimate for tourism revenue that directly benefited from implementation of the Clean Water Act would be $550 million.

According to the U.S. Fish and Wildlife Service (2012), in 2011 just over $1.7 billion were realized in Arkansas for total wildlife related expenditures (hunting, fishing, and wildlife watching)(Table 2). The quality of all these recreational activities is directly related to the quality of Arkansas's water resources. The conservative estimate for wildlife related expenditure revenue that directly benefited from implementation of the Clean Water Act would be $173 million.

Table 2. Expenditures on Fishing, Hunting, and Wildlife Watching in Arkansas, 2011.

Fishing expenditures	$495,584,000
Hunting expenditures	$1,021,379,000
Wildlife watching	$216,074,000
Total	$1,733,037,000

Aquaculture

Nationally, Arkansas is an important state for aquaculture. Arkansas ranks third in the U.S. in catfish production, and leads the nation in baitfish, goldfish, sport-fish, largemouth bass, hybrid striped bass fry, and carp production. According to the University of Arkansas at Pine Bluff, Arkansas has a $167 million aquaculture industry with an economic value of over $1.2 billion. The conservative estimate of the economic benefit from the aquaculture industry in the State related to implementation of the Clean Water Act would be $120 million.

Fisheries is another economically important industry for Arkansas, with three National Fish Hatcheries (NFH). According to the U.S. Fish and Wildlife Service website, Norfork NFH generates $5.86 in tax revenue for each $1 of budget expenditures; additionally, for every $1 of operational budget spent, $95 is put back into the economy. For every tax dollar expended for recreational fish production at Mammoth Spring NFH, $12 of net economic value is created, which amounts to an economic yield of more than $1.5 million every year. For Greers Ferry NFH, every $1 of hatchery operational budget spent returns $113 back into the economy.

Water-Critical Industries

The principal industries in Arkansas are manufacturing, agriculture, forestry, business services, and tourism (Table 3); these industries accounted for 12.5% of Arkansas's general revenue in 2010, or over $12.8 billion. Arkansas's industries are dependent upon, and thus benefit from, high quality water resources. The conservative estimate for industry revenue that directly benefited from implementation of the Clean Water Act would be $1.28 billion.

Table 3: Economic Benefits from Industries in Arkansas by Category, 2010.

Industry Category	2010 Revenues (billion)	Percent Gross State Product ($102.566 billion)
Agriculture, Forestry & Fishing	$2.872	2.8%
Nondurable Goods Manufacturing Industry	$7.489	7.3%
Accommodation and Food Services Industry	$2.49	2.4%
TOTAL	**$12.851**	**12.5%**

Source: Arkansas Department of Economic Development, Bureau of Economic Analysis

Summary of Benefits

The cumulative benefits of implementing Clean Water Act programs in Arkansas are estimated to be more than $2.123 billion (using the most current data available) (Table 4). Economic benefit calculations are conservative to account for overlap in economic sources and other variables, and may underestimate actual benefits. These estimates do not quantify other critical benefits, such as reducing the cost of water treatment for drinking water, the health effects of untreated poor quality water, etc.

Table 4: Summary of Benefits Associated with Implementing Clean Water Act Programs in the State of Arkansas.

Economic Source	Principal Activities	Economic Benefits* (Million)
Tourism	Water recreation, sightseeing, etc.	$550
Aquaculture	Propagation of sport fish	$120
Wildlife	Hunting, fishing, and wildlife watching	$173

Industry	Manufacturing, agriculture, forestry, business services, and tourism	$1280
	TOTAL	**$2123**

*Estimate based on total revenue for source.

Economic Savings from Clean Water

Water utility customers will not sustain negative economic impacts through increased costs for drinking water, if water quality standards are upheld and designated uses are maintained.

Water Treatment Costs

Water treatment costs directly impact citizens because the higher the cost of water treatment due to water quality issues the higher the cost is to the municipal user. One such issue requiring additional treatment is taste and odor (hereinafter "T&O"). Taste currently has no national primary drinking water regulations; however, USEPA has set a Secondary Maximum Contaminant Level (SMCL) for odor. Although there are not always direct discharges of the constituents that cause T&O issues to lakes and streams, exceedances of other water quality standards (due to point sources and non-point sources) create conditions which cause bacteria and/or algae to thrive and create T&O issues indirectly.

As an example, in a 2008 study by Black and Veatch for Beaver Water District, options for T&O control were investigated and costs were analyzed (Table 5). Objectionable T&O in drinking water may be caused by the presence of microbial metabolites and degradation products, anthropogenic volatile and synthetic organic compounds, and naturally occurring inorganic compounds. Numerous microbial species produce odors variously described as sweet, grassy, musty, earthy, swampy, fishy, and septic. Different methods to control the T&O were considered and a preliminary evaluation was conducted for four viable T&O control options: powdered activated carbon (PAC), granular activated carbon (GAC), ozonation, and ultraviolet (UV) with hydrogen peroxide.

Table 5: Order of Magnitude Cost

Alternative	**Capital Cost ($ million)**	**O&M Cost ($ thousand)**	**Annualized Cost ($ thousand)**	**Wholesale Rate Impact ($/1000 gal)**
PAC	60.5	1,790	6,440	0.48
Ozonation	37.7	480	4,010	0.27
PAC & Ozonation	42.2	790	4,500	0.32
UV/H2O2	83.8	1,110	8,920	0.61
PAC & UV/H2O2	65.2	1,220	6,940	0.49

For assumptions, please refer to Black and Veatch. 2008. Beaver Water District Taste and Odor Evaluation Report.

For Beaver Water District, the recommended alternative, PAC and ozonation, had capital costs of $42.2 million, annual O&M costs of $790,000, and a wholesale rate impact of $0.32 per 1000 gallons. If the cost is only applied to residential customers, the wholesale rate impact could be as high as $0.42 per 1000 gallons. With an average household usage of 6,000 gallons per month, the average bill would increase from about $21 per month to about $23.5 per month, which is about $30 per year.

Drinking water sources may have water quality issues unrelated to taste and odor. Other water quality issues may require additional treatment using coagulants, disinfectants, pH adjusters, etc. As an example, a 1997 study titled Costs of Water Treatment due to diminished water quality: a case study in Texas, found that when regional raw water contamination is present, the chemical cost of water treatment is increased by $95 per million gallons from a base of $75.

The processes needed to treat for these other water quality issues and associated costs vary (Table 6). Municipal users would save money by not having to incur the costs associated with additions to the treat plant processes.

Table 6. Water treatment chemical and costs per unit.

Chemical	Cost/unit	Use
Alum (aluminum sulfate)	0.10	coagulation
Lime	0.10	pH adjustment
Chlorine	0.10	disinfection
Polymer	3.00	coagulation
Caustic soda	0.32	coagulation
Ferric sulfate	0.18	disinfection
Activated carbon	0.58	coagulation
Ammonia	0.24	disinfection
Potassium permanganate	1.58	coagulation
Copper sulfate	0.06	disinfection
Soda Ash	0.10	pH adjustment
Sodium chlorite	0.14	disinfection

Regulation-Specific Impacts

State: a) the specific public and/or private entities affected by this rulemaking, indicating for each category if it is a positive or negative economic effect; and b) provide the estimated number of entities affected by this proposed rule.

2.104 Policy for Compliance

a) *This proposed rulemaking will affect permitted entities with compliance schedules that are 1) seeking site specific criteria development or 2) under a plan approved by the Department. This proposed rule could lessen the economic impact on entities under Department compliance schedules.*

b) *There are currently 250 individual National Pollutant Discharge Elimination System (NPDES) permitted entities that have compliance schedules that could potentially be affected by this proposed rule.*

2.106 Definitions

Critical flows definition:

a) *1. Specifying a flow of Q7-10 for those streams with site specific minerals criteria developed by ADEQ will not affect any specific public and/or private entity. Q7-10 flow is currently utilized for these waters.*

2. Specifying the site specific flow stated in criteria documentation for those streams with site specific minerals criteria developed by a third party could result in a reevaluation of permit limitations based upon the site specific flow stated in the criteria documentation. This may have a positive or negative impact depending on the flow utilized to calculate current permit limits.

3. Specifying the use of harmonic mean flow when utilizing the ecoregion reference stream minerals values could result in a reevaluation of permit limitations depending on the flow utilized to calculate current permit limits. This may have a positive or negative impact.

4. Specifying the use of Q7-10 when utilizing the domestic water supply minerals criteria could result in a reevaluation of permit limitations depending on the flow utilized to calculate current permit limits. This may have a positive or negative impact.

b) *1. There will be no specific entities affected by this proposed rule.*

2., 3., 4. There are approximately 43 entities that have "report only" requirements for at least one minerals parameter in their individual NPDES permits. There are approximately 44 entities that have limits for at least one mineral parameter in their individual NPDES permits.

2.106 Definitions

a) *The definitions for aquatic life, bioaccumulation, conventional pollutants, criterion continuous concentration, criterion maximum concentration, ground water, ground water under the direct influence of surface water, harmonic mean flow, headwater, maximum contaminant level, natural background, nonpoint source, and seasonal aquatic life will not affect any specific public or private entities; these revisions will not lead to stricter permit limits.*

b) *There will be no specific entities affected by this proposed rule.*

2.302 Designated Uses

a) *This proposed rulemaking will not affect any specific public and/or private entities; the reference to Appendices A and D in this section refers to previously approved Site Specific Designated Use Variations. The revision from "Fisheries" use to "Aquatic Life" use and the revision from the term "aquatic life" to "aquatic biota" will add clarification to this designated use.*

b) *There will be no specific entities affected by this proposed rule.*

2.304 Physical Alteration of Habitat

a) *This proposed rulemaking will not affect any specific public and/or private entities; it reverts back to the language previously approved by the EPA in 2004.*

b) *There will be no entities affected by this proposed rule.*

2.401 Applicability

a) *This proposed rulemaking will not affect any specific public and/or private entities; the additional text states that site specific criteria are noted in Appendix A.*

b) *There will be no entities affected by this proposed rule.*

2.402 Nuisance Species

a) *This proposed rulemaking will have no added burden to permitted entities. Revision from the term "aquatic life" to "aquatic biota" in this rule will eliminate potential confusion with the Aquatic Life Designated Use.*

b) *There will be no specific entities affected by this proposed rule.*

2.404 Mixing Zones

a) *1. This proposed rule may affect those facilities whose permits utilize a mixing zone for pH and do not fall within the exemptions for publicly owned treatment works ("POTWs") under 40 C.F.R. § 133.102(c).*

2. This proposed rulemaking may affect public or private entities that discharge a substance that is bioaccumulative, persistent, carcinogenic, mutagenic, or teratogenic and whose permits utilizes a mixing zone for these parameters.

3. This proposed rulemaking would potentially affect those public and private entities with water supply intake or public water supply wells that have been determined by the state to be ground water under the direct influence of surface water connected to the mixing zone.

b) *1. At this time, ADEQ is unaware of any facilities whose permits utilizes a mixing zone for pH and do not fall within the exemptions for publicly owned treatment works ("POTWs") under 40 C.F.R. § 133.102(c). (Currently there are 33 facilities whose permit's utilize a mixing zone for pH are exempt under 40 C.F.R. § 133.102(c)).*

2. At this time, ADEQ is unaware of any facilities whose permits utilizes a mixing zone when discharging a substance that is bioaccumulative, persistent, carcinogenic, mutagenic, or teratogenic and whose permits currently consider a mixing zone.

3. At this time, ADEQ is unaware of any facilities with water supply intake or public water supply wells that have been determined by the state to be ground water under the direct influence of surface water connected to the mixing zone.

2.405 Biological Integrity

a) *This proposed rulemaking will have no added burden to permitted entities. The revision of response variable requirements will not lead to stricter permit limits. As previously written, the only comparison between communities that can currently be made is with communities that have similar aquatic species with similar abundances. Thus, comparisons between impacted and non-impacted sites are not permissible. This is clearly not the intent of the regulation.*

The removal of the words "collect and" from the last sentence is in direct compliance with 40 CFR 130.7(5) "Each state shall assemble and evaluate all existing and readily available water quality-related data..." Maintaining this language could be interpreted as requiring ADEQ to perform all biological assessments as they relate to standards changes. That interpretation would limit the amount of biological data available for use with assessments.

Every two years ADEQ solicits data from approximately 94 entities when updating the 303(d) list and 305(b) report.

b) *There will be no specific entities affected by the proposed rule.*

2.409 Toxic Substances

a) This proposed rulemaking will have no added burden to permitted entities. Revision from the term "aquatic life" to "aquatic biota" in this rule will eliminate potential confusion with the Aquatic Life Designated Use.

b) There will be no specific entities affected by this proposed rule.

2.501 Applicability

a) This proposed rulemaking will not affect any specific public and/or private entities; the additional text states that site specific criteria are noted in Appendix A.

b) There will be no entities affected by this proposed rule.

2.502 Temperature

a) This proposed rulemaking will not affect any specific public and/or private entities. It will allow the regulation to more accurately reflect ADEQ's Assessment Methodology. ADEQ will be positively affected in that there will no longer be inconsistency concerning the assessment of lake temperature data collected in various lake layers.

b) ADEQ will be the only entity affected.

2.503 Turbidity

a) This proposed rulemaking will not affect any specific public and/or private entities. It will allow the regulation to more accurately reflect ADEQ's Assessment Methodology. ADEQ will be positively affected in that there will no longer be inconsistency concerning the assessment of turbidity.

b) ADEQ will be the only entity affected.

2.504 pH

a) This rulemaking will affect entities permitted or seeking permits to discharge into waters that can be shown to have natural background conditions resulting in pH values either less than or greater than the criteria listed. No negative effects are anticipated from this rulemaking; however, positive effects are anticipated in that permit limits and assessment criteria would more accurately reflect natural conditions and not be unnecessarily restrictive.

b) Currently no permits rely on this provision for pH limits.

2.505 Dissolved Oxygen

a) This proposed rulemaking will have no added burden to permitted entities; it only reformats the regulation for ease of reading. Revision from the term "aquatic life" to "aquatic biota" in this rule will eliminate potential confusion with the Aquatic Life Designated Use. This proposed rule will more accurately reflect ADEQ's Assessment Methodology. ADEQ will be positively affected in that there will no longer be inconsistency concerning the assessment dissolved oxygen data collected in various lake layers.

b) ADEQ will be the only entity affected.

2.507 Bacteria

a) This proposed rulemaking will not affect any specific public and/or private entities; it

only reformats the regulation for ease of reading.

b) *There will be no entities affected by this proposed rule.*

2.508 Toxic Substances

a) *This proposed rulemaking will not affect any specific public and/or private entities; it only removes "shall not exceed" type language. Based on recent litigation, EPA has indicated that language such as "shall not exceed" may not be appropriate for standards when a state's assessment methodology allows for more than one exceedance. This proposed rule will more accurately reflect ADEQ's Assessment Methodology.*

b) *ADEQ will be the only entity affected.*

2.509 Nutrients

a) *This proposed rulemaking will affect entities permitted or seeking permits to discharge into Beaver Lake. Entities with individual NPDES permits may receive more stringent permit monitoring and/or limits. However, this proposed rule will produce positive economic benefits for customers that use Beaver Lake as a public drinking water source. If taste and odor events were to continue, causing ozonation and activated carbon treatments to be added, water customers would see a wholesale rate increase of $0.32 per thousand gallons. Added protection at this time may negate the need for further treatment practices in the future.*

b) *There are currently four entities with individual NPDES permits that discharge into Beaver Lake. There are over 400,000 people and industries that rely on Beaver Lake as a drinking water source.*

2.510 Oil and Grease

a) *This proposed rulemaking will not affect any specific public and/or private entities; it only removes "shall not exceed" type language.*

b) *There will be no entities affected by this proposed rule.*

2.511 Minerals Quality

2.511(A)

a) *1. The addition of the number of samples and the exceedance criteria will not affect any specific public and/or private entities. This proposed rule will more accurately reflect ADEQ's Assessment Methodology and will eliminate potentially confusing language.*

2. Splitting the table into two tables one of site specific standards developed by ADEQ and one of site specific standards developed by a third party will not affect any specific public or private entities. Splitting the table will help to avoid confusion when permits are written that discharge into one of the streams on the tables.

3. The addition of specific lock and dam names, "state line" and US or State highways will not affect any specific public and/or private entities. These revisions will clarify current stream descriptions.

4. This proposed rulemaking will affect the Bayou Meto Water District and any future entities permitted or seeking permits to discharge into the portion of Bayou Two Prairie

that flows thru the Smoke Hole Natural Area, which is designated as an ERW.

b) *1. ADEQ and EPA will be the only entities affect by proposed rule.*
2. ADEQ will be the only entity affect by the table split.
3. There will be no entities affected by this proposed rule.
4. Currently there are no entities that discharge directly into the segment of Bayou Two Prairie that is designated as an ERW. There are five entities with individual NPDES permits that discharge to portions of Bayou Two Prairie upstream of the ERW designated segment.

2.511(B)

a) *This rulemaking will not affect any specific public and/or private entities. The April 23, 2004 version of Regulation No. 2, as promulgated by the Commission and approved by EPA, contained a table of minerals values organized by ecoregion and text describing how to use the table to calculate ecoregion reference stream values. In the October 26, 2007 version of Regulation No. 2, as promulgated by the Commission, these ecoregion reference stream values were calculated in the table (in an effort to make the table easier to interpret); however, the text describing how to calculate the ecoregion reference stream values was inadvertently left in the document. Therefore, EPA disapproved of the revised (Calculated Ecoregion Reference Stream Values (Regulation 2.511(B)) table because it retained the previous text describing the calculations along with the updated table and effectively revised ecoregion chloride, sulfate, and total dissolved solids criteria associated with Regulation 2.511 to less stringent concentrations. EPA suggested that the text after the first sentence be removed.*

b) *The implementation of Reg. 2.511(B) has not changed; there will be no entities affected by this proposed rule.*

2.511(C)

a) *This proposed rulemaking will not affect any specific public and/or private entities. It clarifies that the values in 2.511(C) are criteria, not just limits and that exceptions to this rule must follow both Regs.2.306 and 2.308.*

b) *There will be no entities affected by this proposed rule.*

2.512 Ammonia

a) *This proposed rulemaking will not affect any specific public and/or private entities; it only removes "shall not exceed"-type language.*

b) *There will be no entities affected by this proposed rule.*

Appendix A

a) *1. Revisions to Appendix A maps will make the document easier to interpret and make use of updated GIS data. This proposed rulemaking will not negatively affect any specific public and/or private entities.*
2. The identification of threatened and endangered species found in those segments currently designated as Ecologically Sensitive Waterbodies ("ESW") will aid ADEQ and other state agencies in protecting the aquatic habitat for those species protected under the ESW designated use.

3. "Aquatic life use" more accurately labels the designated use that "provides for the protection and propagation of fish, shellfish, and other forms of aquatic biota."
4. The additions to the headings and the addition of footnotes will make the appendix easier to interpret regarding site specific designated uses and standards.
5. The addition of "state line", neighboring state names, and United States or Arkansas highways will not affect any specific public and/or private entities. These revisions will clarify current stream descriptions.

b) *There will be no entities affected by this proposed rule.*

Appendix C

a) *This proposed rulemaking will have no added burden to permitted entities. Currently, only the common names of aquatic species, whose habitat is protected under the designated use of Ecologically Sensitive Waterbody, are listed in Appendix A. Usage of common names can vary throughout a species range; therefore, notation of the scientific name will add clarity to the ESW designation.*

b) *This list will aid ADEQ and other state agencies in the review of ESWs, and the threatened and endangered species whose habitat is protected under the designated use.*

Appendix D

a) *This proposed rulemaking will have no added burden to permitted entities. Currently, Extraordinary Resource Waters, Natural and Scenic Waterways, and Ecologically Sensitive Waterbodies are listed and depicted throughout Appendix A. This proposed rule adds a list (in one location) of all of the ERWs, NSWs, and ESWs in the State.*

b) *This list will aid ADEQ and other state agencies in the review of the ERW, NSW, and ESW designated uses.*

Sources and Assumptions (for all of the above):
Attachment 1*: State of Arkansas 2012 Integrated Water Quality Monitoring and Assessment Report: Part II – Chapter 3 – Cost/Benefit Analysis*

Regulation Establishing Water Quality Standards for Surface Waters of the State of Arkansas as revised, effective April 23, 2004.

Regulation Establishing Water Quality Standards for Surface Waters of the State of Arkansas as revised, effective August 26, 2011.

Integrated Compliance Information System – NPDES

EPA Comments for State Consideration for the 2010 Triennial Revision of Regulation No. 2: Regulation Establishing Water Quality Standards for Surface Waters of the State of Arkansas, received August 28, 2009.

Beaver Water District Taste and Odor Evaluation Report, prepared by Black & Veatch (2008)

Beaver Lake Site-Specific Water Quality Criteria Development: Recommended Criteria, prepared by FTN-Associates, Ltd., February 8, 2008

http://www.bwdh2o.org/

2010 Integrated Water Quality Monitoring and Assessment Report, Prepared pursuant to Sections 305(b) and 303(d) of the Federal Water Pollution Control Act

2012 Integrated Water Quality Monitoring and Assessment Report, Prepared pursuant to Sections 305(b) and 303(d) of the Federal Water Pollution Control Act

TMDLS for Dissolved Oxygen for White River below Bull Shoals Dam and North Fork River below Norfork Dam. 2009. FTN Associates, Ltd.

U. S. Fish and Wildlife Service. 2012. 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. State Overview.

http://www.fws.gov/greersferry/ (Greers Ferry data)

http://www.fws.gov/norfork/ (Norfork data)

U.S. EPA Record of Decision: Regulation No. 2: Regulation establishing Water Quality Standards for Surface Waters of the State of Arkansas, received January 24, 2008.

2. What are the economic effects of the proposed rule? State: 1) the estimated increased or decreased cost for an average facility to implement the proposed rule; and 2) the estimated total cost to implement the rule.

2.104 Policy for Compliance

1) *This proposed rule would decrease the cost for an average facility that is completing site specific criteria development or is under a plan approved by the Department by designating the requirements for an exception to a three year compliance schedule. Providing for extended compliance schedules would promote the use of monies that might be assessed as fines to be applied to compliance measures. Fines associated with enforcement action can range from a base of $50 for a minor noncompliance event to a base of over $9,600 for a major noncompliance event.*
2) *There will be no cost to permitted entities to implement the rule. Any penalty funds foregone by ADEQ will be offset by continued compliance with approved schedules and, ultimately, achievement of compliance with applicable water quality standards.*

2.106 Definitions

Critical flows definition

1) *The estimated costs associated with collecting the flow data necessary to calculate the harmonic mean flow for a receiving waterbody ranges from $10,000 to $18,000.*

The costs associated with updating facilities in order to meet stricter limits due to the potential differences in facility design can vary greatly. These differences could include, but are not limited to: type of discharge; chemicals, processes, and mechanics used during production;

characteristics of receiving waterbody; age and size of facility.

If a stormwater construction permit is needed as a result of the proposed rule, the facility would incur the $200 fee associated with a stormwater construction permit.

If a permit modification is needed as a result of the proposed rule, the facility would incur the cost associated with a permit modification:
- Major Municipal and Major Industrial Permit: Major Mod = $5,000; Minor Mod = $1,000
- Minor Municipal and Minor Industrial Permit: Major Mod = $2,000; Minor Mod = $1,000

Entities with stricter monitoring requirements for minerals may incur increased cost of monitoring chlorides (Cl), sulfates (SO_4), and total dissolved solids (TDS). Estimated average cost for analysis for these parameters by Little Rock area laboratories is $19.00 per sample for Cl and SO_4, and $21.00 per sample for TDS.

Failure to meet these limits may result in a formal enforcement action, including the assessment of civil penalties. Penalties associated with enforcement action can range from a base of $50 for a minor noncompliance event to a base of greater than $9,600 for a major noncompliance event.

In order to meet stricter permit limits for minerals, permittees may implement additional treatment. Reverse osmosis (RO) treatment is capable of removing CL, SO_4, and TDS.

A summary of recent RO estimates developed by facilities in Arkansas:
Municipality 1
Capital costs of installing a three stage RO treatment system handling an average of 1,500 gallons per minute (gpm) of water for a municipal wastewater facility have been estimated as follows:
Capital cost $6,500,000
Annual operating cost $4,400,000

Municipality 2
Capital costs of installing a membrane treatment system for a municipal facility with an average design capacity of 12.6 million gallons per day (mgd) has been estimated as follows:
Capital cost $188 million to $396 million

Industry 1
Capital costs of installing advanced treatment, including ultra-filtration, reverse osmosis, and concentration/crystallization for an industrial facility with a design flow of 1.25 mgd has been estimated as follows:
Capital cost $30.5 million
Annual operating cost $4.6 million

Industry 2
Capital costs of installing a RO treatment system handling an average of 150 gpm of water for an industrial facility have been estimated as follows:
Capital cost $650,000

Annual operating cost $441,000

Industry 3
Capital costs of installing a RO with deep well injection of the RO reject stream for an industrial facility has been estimated as follows:
Capital cost $44,000,000
Annual operating cost $5,800,000

Industry 4
Capital costs of installing a RO treatment system for an industrial facility has been estimated as follows:
Capital cost $8.4 million
Annual operating cost $2.7 million

Industry 5
Capital costs of installing a RO treatment system handling an average of 0.24 mgd of water for an industrial facility have been estimated as follows:
Capital cost $6,400,000
Annual operating cost $1,020,000

ADEQ analysis of RO treatment costs

The ADEQ analysis did not include additional pretreatment costs or costs of the disposal of the RO waste stream. It was presumed that the quality of the wastewater treated by a RO system would be of high enough quality to prevent over-fouling of the membranes, thus making additional pretreatment unnecessary. Additionally, disposal costs were not included due to the difficulty of calculating an "average" cost. Disposal would most likely be through underground injection wells. Examples of some of the costs of sending wastewater to an injection well will depend on: 1) whether the facility will need to further concentrate the waste stream prior to its acceptance at a well; 2) the distance of a POTW to an existing injection well (transportation costs); and 3) whether the facility will need to drill a new underground injection well.

The analysis was based on estimated per gallon capital and operating and maintenance (O&M) costs to add a RO treatment system to existing conventional drinking water plants with surface water sources. A major assumption in the analysis is that the number of banks of filters and pretreatment requirements should be the same for existing wastewater treatment plants and drinking water plants. The 4.2% interest rate for annualizing present value costs is based on historical 20-year municipal bond data from the Federal Reserve's website (average of 20-year municipal bond rates from December 2010 to November 2012).

See Table 7 on the next page for a summary of ADEQ's analysis.

Table 7. Analysis of Reverse Osmosis Treatment Costs

	up to 0.01 MGD	up to 0.1 MGD	up to 1 MGD	up to 10 MGD	up to 100 MGD	
Total Number of Facilities:	**1**	**105**	**152**	**51**	**8**	Totals
Capital Cost (1 time, present value) for all plants in size category:	$82,500.00	$11,630,850.00	$58,026,500.00	$168,695,000.00	$104,632,500.00	$343,067,350.00
O&M Cost (annual cost) for all plants in size category:	$50.00	$9,969.30	$52,223.85	$109,651.75	$76,730.50	$248,625.40

	up to 0.01 MGD	up to 0.1 MGD	up to 1 MGD	up to 10 MGD	up to 100 MGD	
Total Number of Facilities:	**1**	**105**	**152**	**51**	**8**	Total
Capital Cost (annualized over 20 years at 4.2%) for all plants in size category:	$6,178.49	$871,043.12	$4,345,648.29	$12,633,695.62	$7,836,006.74	$25,692,572.25
O&M Cost (annual cost) for all plants in size category:	$50.00	$9,969.30	$52,223.85	$109,651.75	$76,730.50	$248,625.40
Annualized Total:	$6,228.49	$881,012.42	$4,397,872.14	$12,743,347.37	$7,912,737.24	$25,941,197.65

	up to 0.01 MGD	up to 0.1 MGD	up to 1 MGD	up to 10 MGD	up to 100 MGD	
Total Number of Facilities:	**1**	**105**	**152**	**51**	**8**	Total
Capital Cost (1 time, present value) for all plants in size category:	$82,500.00	$11,630,850.00	$58,026,500.00	$168,695,000.00	$104,632,500.00	$343,067,350.00
O&M Cost (present value of 20 years at 4.2%) for all plants in size category:	$667.64	$133,117.90	$697,333.75	$1,464,156.06	$1,024,565.74	$3,319,841.09
Present Value:	$83,167.64	$11,763,967.90	$58,723,833.75	$170,159,156.06	$105,657,065.74	$346,387,191.09

2) *The following are potential costs of implementing this ruling:*
If a Use Attainability Analysis (UAA) is needed as a result of the proposed rule, the ADEQ Water Planning section would incur a base estimate cost of $5,743 for a base estimate of 336 man hours to process the UAA.

If a UAA is needed as a result of the proposed rule, the ADEQ Legal Division would incur a base estimate cost of $375 for a base estimate of fifteen (15) man hours to review the UAA and related third-party rulemaking documents.

If a Consent Administrative Order (CAO) is needed as a result of the proposed rule, ADEQ Water Enforcement section would incur a base cost of $287 for a base estimate of sixteen (16) man hours to process the CAO.

If a CAO is needed as a result of the proposed rule, the ADEQ Legal Division would incur a base cost of $250 for a base estimate of ten (10) man hours to process the CAO. If formal enforcement through a Notice of Violation (NOV) is necessary, the base estimated cost would be increased at least twofold.

If a permit modification is needed as a result of the proposed rule, the ADEQ Water Permits section would incur a base cost of $754 for a base estimate of forty (40) man hours to process the permit modification.

If a permit modification is needed as a result of the proposed rule, the ADEQ Legal Division would incur a base cost of $300 for a base estimate of twelve (12) man hours to review the permit modification. Any appeal of the permit modification would increase the base estimated costs by at least threefold.

If a TMDL is required for a waterbody as a result of that waterbody being assessed as impaired, ADEQ would incur the following estimated costs. Through consultant contract, ADEQ would incur a base estimated cost range of $35,900 to $84,800 per TMDL package, depending upon the complexity of the TMDL package. The ADEQ Water Planning section would incur a base cost of $5,470 for a base estimate of three hundred and twenty (320) man hours to process a TMDL package.

2.106 Definitions

1) *The revision of the definitions for aquatic life, bioaccumulation, conventional pollutants, criterion continuous concentration, criterion maximum concentration, groundwater, ground water under the direct influence of surface water, harmonic mean flow, headwater, maximum contaminant level, natural background, nonpoint source, and seasonal aquatic life will have no increased or decreased cost for the average facility to implement this proposed rule.*
2) *There is no extra cost to implement this proposed rule.*

2.302 Designated Uses

1) *There will be no increased or decreased cost for the average facility to implement this proposed rule.*
2) *There is no extra cost to implement this proposed rule.*

2.304 Physical Alteration of Habitat

1) *There will be no increased or decreased cost for the average facility to implement this proposed rule.*
2) *There is no extra cost to implement this proposed rule.*

2.401 Applicability

1) *There will be no increased or decreased cost for the average facility to implement this proposed rule.*
2) *There is no extra cost to implement this proposed rule.*

2.402 Nuisance Species

1) *There will be no increased or decreased cost for the average facility to implement this proposed rule.*
2) *There is no extra cost to implement this proposed rule.*

2.404 Mixing Zones

1) *There may be an increase in costs for the average facility to implement this proposed rule if they currently are or are planning to consider a mixing zone under one of the following scenarios:*
    a. *pH that does not fall within the exemptions for POTWs found in 40 C.F.R. § 133.102(c);*
    b. *discharge of a substance that is bioaccumulative, persistent, carcinogenic, mutagenic, or teratogenic;*
    c. *water supply intake or public water supply wells that have been determined by the State to be ground water under the direct influence of surface water connected to the mixing zone.*
2) *These facilities may incur increased cost due to revisions to the facility or the outfall in order to meet the requirements of this proposed rule.*
3) *There is no extra cost to implement this proposed rule.*

2.405 Biological Integrity

1) *There will be no increased or decreased cost for the average facility to implement this proposed rule. The type of data necessary for an aquatic biota assessment is not changing, only the text describing how this data is to be interpreted.*
2) *There is no extra cost to implement this proposed rule.*

2.409 Toxic Substances

1) *There will be no increased or decreased cost for the average facility to implement this proposed rule.*
2) *There is no extra cost to implement this proposed rule.*

2.501 Applicability

1) There will be no increased or decreased cost for the average facility to implement this proposed rule.

2) There is no extra cost to implement this proposed rule.

2.502 Temperature

1) There will be no increased or decreased cost for the average facility to implement this proposed rule. The cost of collecting lake and reservoir temperature data will not change due to a depth of 1.0 meter being specified.

2) There is no extra cost to implement this proposed rule.

2.503 Turbidity

1) There will be no increased or decreased cost for the average facility to implement this proposed rule. The cost of collecting lake and reservoir turbidity data will not change due to a depth of 1.0 meter being specified.

2) There is no extra cost to implement this proposed rule.

2.504 pH

1) This proposed rule may affect those facilities whose permits currently consider a mixing zone for pH that do not fall under the exemptions for POTWs found in 40 C.F.R. § 133.102(c).

2) These facilities may incur increased cost due to revisions to the facility or the outfall in order to meet the requirements of this proposed rule.

2.505 Dissolved Oxygen

1) There will be no increased or decreased cost for the average facility to implement this proposed rule.

2) *There is no extra cost to implement this proposed rule.*

2.507 Bacteria

1) There will be no increased or decreased cost for the average facility to implement this proposed rule.

2) There is no extra cost to implement this proposed rule.

2.508 Toxic Substances

1) There will be no increased or decreased cost for the average facility to implement this proposed rule.

2) There is no extra cost to implement this proposed rule.

2.509 Nutrients

1) Entities discharging into Beaver Lake may have stricter permit limits or monitoring conditions. The costs associated with updating facilities in order to meet stricter limits can vary greatly due to the potential differences in facility design. These differences could include, but are not limited to: type of discharge; chemicals, processes, and mechanics used during production; characteristics of receiving waterbody; and age and size of facility.

If a stormwater construction permit is needed as a result of the proposed rule, the facility would incur the $200 fee associated with a stormwater construction permit.

If a permit modification is needed as a result of the proposed rule, the facility would incur the cost associated with a permit modification.
- Major Municipal and Major Industrial Permit: Major Mod = $5,000; Minor Mod = $1,000
- Minor Municipal and Minor Industrial Permit: Major Mod = $2,000; Minor Mod = $1,000

Entities with stricter monitoring requirements for nutrients may incur increased cost of monitoring Total Nitrogen (TN) and Total Phosphorus (TP). Estimated average cost for analysis for these parameters by Little Rock area laboratories is $72 per sample of TN and $26.00 per sample for TP.

Failure to meet these limits may result in a formal enforcement action including the assessment of civil penalties. Penalties associated with enforcement action can range from a base of $50 for a minor noncompliance event, to a base of greater than $9,600 for a major noncompliance event.

2) The following are potential costs of implementing this rule:
If a Consent Administrative Order (CAO) is needed as a result of the proposed rule, ADEQ Water Enforcement section would incur a base cost of $287 for a base estimate of sixteen (16) man hours to process the CAO.

If a CAO is needed as a result of the proposed rule, the ADEQ Legal Division would incur a base cost of $250 for a base estimate of ten (10) man hours to process the CAO. If formal enforcement through a Notice of Violation (NOV) is necessary, the base estimated cost would be increased at least twofold.

If a permit modification is needed as a result of the proposed rule, the ADEQ Water Permits section would incur a base cost of $754 for a base estimate of forty (40) man hours to process the permit modification.

If a permit modification is needed as a result of the proposed rule, the ADEQ Legal Division would incur a base cost of $300 for a base estimate of twelve (12) man hours to review the permit modification. Any appeal of the permit modification would increase the base estimated costs by at least threefold.

2.510 Oil and Grease

1) *There will be no increased or decreased cost for the average facility to implement this proposed rule.*
2) *There is no extra cost to implement this proposed rule.*

2.511(A) Mineral Quality

1) *a., b., & c. There will be no increased or decreased cost for the average facility to implement this proposed rule.*

d. Entities discharging into Bayou Two Prairie, in or upstream of the ERW designated segment, may have stricter permit limits. Updating facilities in order to meet stricter limits can vary greatly due to the potential differences in facility design. These differences could include, but are not limited to: type of discharge; chemicals, processes, and mechanics used during production; characteristics of receiving waterbody; and age and size of facility. Failure to meet these limits may result in a formal enforcement action including the assessment of civil penalties.

2) *There is no extra cost to implement this proposed rule.*

2.511(B) Mineral Quality

1) *There will be no increased or decreased cost for the average facility to implement this proposed rule.*
2) *There is no extra cost to implement this proposed rule.*

2.511(C) Mineral Quality

1) *There will be no increased or decreased cost for the average facility to implement this proposed rule.*
2) *There is no extra cost to implement this proposed rule.*

2.512 Ammonia

1) *There will be no increased or decreased cost for the average facility to implement this proposed rule.*
2) *There is no extra cost to implement this proposed rule.*

Appendix A

1) *There will be no increased or decreased cost for the average facility to implement this proposed rule.*
2) *There is no extra cost to implement this proposed rule.*

Appendix C

1) *There will be no increased or decreased cost for the average facility to implement this proposed rule.*
2) *There is no extra cost to implement this proposed rule.*

Appendix D

1) *There will be no increased or decreased cost for the average facility to implement this proposed rule.*
2) *There is no extra cost to implement this proposed rule.*

Sources and Assumptions (for all of the above):

Arkansas Department of Environmental Quality Uniform Penalty Policy, March 1, 2012.

Arkansas Pollution Control and Ecology Commission, Regulation No. 9, Fee Regulation, June 22, 2012.

Federal Reserve System. Selected Interest Rates, Historical Data, State and Local Bonds. Accessed 12/17/2012. www.federalreserve.gov/releases/h15/data.htm.

Loutre Creek – Section 2.303 Use Attainability Analysis, August 31, 2012.

Poteau River – Section 2.306 Site Specific Water Quality Study Tyson Foods, Inc. July 2, 2012.

Total Maximum Daily Load Development for Water Bodies Listed on the 2008 List of Impaired Water Bode4is (303d List), Prepared by FTN & Associates, December 2, 2009.

Use Attainability Analysis Report, Bayou DeView and Big Creek, Craighead County, AR, August 26, 2009.

Use Attainability Analysis Report for Boggy Creek, Union County, Arkansas, January 2007

Use Attainability Analysis Report for Brushy Creek, Vulcan Construction Materials, LP Black Rock Quarry Lawrence County, Arkansas, September 12, 2011.

Use Attainability Analysis for Wilson Creek, Garland County, Arkansas, June 2005.

Water Research Foundation/EPA Project 3115. Simultaneous Compliance Tool. 2009. www.simultaneouscompliancetool.org

White River Use Attainability Analysis – Fayetteville, Arkansas (Draft) August 27, 2012.

Assumptions
Cost estimates for ADEQ personnel are based on the entry level base pay for an Enforcement Analyst ($17.933/hour), Engineer ($18.8457/hour), and Ecologist ($17.0933/hour) or $25/hour for an Attorney (average salary estimate).

3. List any fee changes imposed by this proposal and justification for each.

There are no fee changes associated with this proposed rule.

4. What is the probable cost to ADEQ in manpower and associated resources to implement and enforce this proposed change, and what is the source of revenue supporting this proposed rule?

Pursuant to the Clean Water Act ("CWA"), Arkansas has been delegated the authority to establish and administer water quality standards. The CWA requires states to review their water quality standards on a triennial basis and to amend those standards as necessary. The manpower and associated resources required to implement this proposed rule is funded through the Environmental Protection Agency through the delegated CWA program.

The following are potential costs of implementing this rule:
If a Use Attainability Analysis ("UAA") is needed as a result of a proposed rule, the ADEQ Water Planning section would incur a base cost of approximately $5,743 for an estimated 336 man hours to process the UAA.

If a UAA is needed as a result of the proposed rule, the ADEQ Legal Division would incur a base estimate cost of $375 for a base estimate of fifteen (15) man hours to review the UAA and related third-party rulemaking documents.

If a Consent Administrative Order (CAO) is needed as a result of a proposed rule, ADEQ Water Enforcement section would incur a base cost of approximately $287 for an estimated sixteen (16) man hours to process the CAO.

If a CAO is needed as a result of the proposed rule, the ADEQ Legal Division would incur a base cost of $250 for a base estimate of ten (10) man hours to process the CAO. If formal enforcement through a Notice of Violation (NOV) is necessary, the base estimated cost would be increased at least twofold.

If a permit modification is needed as a result of the proposed rule, the ADEQ Water Permits section would incur a base cost of $754 for a base estimate of forty (40) man hours to process the permit modification.

If a permit modification is needed as a result of the proposed rule, the ADEQ Legal Division would incur a base cost of $300 for a base estimate of twelve (12) man hours to review the permit modification. Any appeal of the permit modification would increase the base estimated costs by at least threefold.

Sources and Assumptions:
Ark. Code Ann. §8-4-206 and 8-4-207 (authority and responsibilities as state water pollution control agency).

Assumptions
Cost estimates for ADEQ personnel are based on the entry level base pay for an Enforcement Analyst ($17.933/hour), Engineer ($18.8457/hour), and Ecologist ($17.0933/hour) or $25/hour for an Attorney (average salary estimate).

5. Is there a known beneficial or adverse impact to any other relevant state agency to implement or enforce this proposed rule? Is there any other relevant state agency's rule that could adequately address this issue, or is this proposed rulemaking in conflict with or have any nexus to any other relevant state agency's rule? Identify state agency and/or rule.

There are no known adverse impacts to any other relevant state agency. Other state agencies that are charged with protecting the state's natural resources or water quality, such as Arkansas Game and Fish Commission and the Arkansas Department of Health, will benefit from the proposed rule, as it will support their mission. This proposed rule cannot be adequately addressed by another state agency's rule, as the authority to adopt water quality standards was vested in the Arkansas Pollution Control and Ecology Commission, pursuant to Ark. Code Ann.

§ 8-4-202(b)(3). This proposed rulemaking is not in conflict with, nor has any nexus to another state agency's rule.

Sources and Assumptions:
Ark. Code Ann. § 8-4-202(b)(3) (authority of Commission to adopt water quality standards).

6. Are there any less costly, non-regulatory, or less intrusive methods that would achieve the same purpose of this proposed rule?

There are no less costly, non-regulatory, or less intrusive methods that would achieve the same purpose of the proposed rule. As stated above, the Clean Water Act requires the State to review and update water quality standards every three years. The related federal regulations outline a specific procedure for this process. Alternative methods are not available to comply with the federal requirements.

Sources and Assumptions:
40 C.F.R. § 131.1 et seq.

2B. ENVIRONMENTAL BENEFIT

1. What issues affecting the environment are addressed by this proposal?

These proposed rules address water quality for all waters of the State. These proposals provide for the continued protection of ecological, recreational, and water supply benefits.

2.104 Policy for Compliance
Compliance with water quality limits.

2.106 Definitions
Critical flow definition
The use of an accurate stream flow or harmonic mean flow in calculating permit limitations results in appropriate pollutant concentrations in permits and will protect designated uses. If an inaccurate flow was used, the permit limitation would be inappropriate for actual conditions and could result in the stream being added to the List of Impaired Waterbodies.

2.106 Definitions
Definitions aid in the understanding of the standards that protect Arkansas's water quality.

2.302 Designated Uses
"Aquatic Life" more accurately labels the designated use that "provides for the protection and propagation of fish, shellfish, and other forms of aquatic biota."

2.304 Physical Alteration of Habitat
Continued protection from physical alteration of habitat in waterbodies designated as Extraordinary Resource Waters ("ERW"), Ecologically Sensitive Waterbodies ("ESW"), or Natural and Scenic Waterways ("NSW").

2.401 Applicability
The additional text will help avoid confusion with the application of the general standards and those waterbodies with site specific standards.

2.402 Nuisance Species
Renaming aquatic "life" as aquatic "biota" would help avoid confusion with the Designated Use – Aquatic life.

2.404 Mixing Zones
Mixing zone considerations related to pH; bioaccumulative, persistent, carcinogenic, mutagenic, and teratogenic substances; and water intakes or supply wells determined to be ground water under the direct influence of surface water connected to a mixing zone.

2.405 Biological Integrity
The revision will clarify the collection of biological data for aquatic biota assessments and the interpretation of the data collected.

2.409 Toxic Substances
Renaming aquatic "life" as aquatic "biota" would help avoid confusion with the Designated Use – Aquatic life.

2.501 Applicability
The additional text will help avoid confusion with the application of the specific standards and those waterbodies with site specific standards.

2.502 Temperature
Standardization of lake sampling depth.

2.503 Turbidity
The collection and assessment of turbidity data and standardization of lake sampling depth.

2.504 pH
Clarify lake depths at which standards are applicable and prohibit mixing zones for pH.

2.505 Dissolved Oxygen
Avoiding confusion with the Designated Use – Aquatic life; and standardization of lake sampling depth.

2.507 Bacteria
Appropriate interpretation of bacteria criteria.

2.508 Toxic Substances
Continued protection of waters receiving toxic substances.

2.509 Nutrients
Protection of Beaver Lake as a drinking water source.

2.510 Oil and Grease
Continued protection of waters receiving oil and grease.

2.511(A) Mineral Quality
1., 2., 3. Accurate assessment of site specific minerals criteria for continued protection of waters from excess CL, SO4, and TDS..
4. Protection of water quality in the segment of Bayou Two Prairie designated as an ERW.

2.511(B) Mineral Quality
Appropriate interpretation of ecoregion reference stream values.

2.511(C) Mineral Quality
Continued protection of waters from excess CL, SO4, and TDS.

Reg. 2.512 Ammonia
Continued protection of waters receiving ammonia.

Appendix A
Use of updated GIS data and inclusive listings of those Threatened and Endangered aquatic species whose habitat is currently protected under the ESW designated use.

Appendix C
Continued protection of those Threatened and Endangered aquatic species whose habitat is currently protected under the ESW designated by providing a listing of the scientific names.

Appendix D
Continued protection of waterbodies designated as ERW, ESW, and NSW by providing an easily accessible "all in one place" list.

2. How does this proposed rule protect, enhance, or restore the natural environment for the well being of all Arkansans?

These proposed rules will protect, enhance, or restore the natural environment for the well being of all Arkansans by maintaining and protecting the water quality and biological integrity of all waters of the State.

2.104 Policy for Compliance
Allows the Department to use discretion concerning compliance schedule for effluent limits

2.106 Definitions
Critical flow definition
Provides continued protection for waterbodies which receive discharges whose effluent contains Cl, SO4, and TDS.

2.106 Definitions

The revisions to the definitions in this regulation allow for easier comprehension, thereby providing better protection by eliminating misunderstanding.

2.302 Designated Uses

The revision of this regulation allows for easier comprehension, thereby providing better protection by eliminating misunderstanding.

2.304 Physical Alteration of Habitat

Allows for continued protection of aquatic habitats within waterbodies designated as ERW, ESW, and NSW.

2.401 Applicability

The revision of this regulation allows for easier comprehension, thereby providing better protection by eliminating misunderstanding.

2.402 Nuisance Species

The revision of this regulation allows for easier comprehension, thereby providing better protection by eliminating misunderstanding.

2.404 Mixing Zones

The revision of this regulation allows for protection of waters in which a facility is currently, or is planning to consider a mixing zone under one of the following scenarios:

- ***a.*** *pH that does not fall within the exemptions for POTWs found in 40 C.F.R. § 133.102(c);*
- ***b.*** *discharge of a substance that is bioaccumulative, persistent, carcinogenic, mutagenic, or teratogenic;*
- ***c.*** *water supply intake or public water supply wells that have been determined by the State to be ground water under the direct influence of surface water connected to the mixing zone.*

2.405 Biological Integrity

Allows for the collection of biological data from entities outside of ADEQ. Allowing outside entities to collect additional biological data will enhance ADEQ's decision making and management concerning the state's aquatic biological resources.

2.409 Toxic Substances

The revisions to the definitions in this regulation allow for easier comprehension, thereby providing better protection by eliminating misunderstanding.

2.501 Applicability

The revision of this regulation allows for easier comprehension, thereby providing better protection by eliminating misunderstanding.

2.502 Temperature

The revisions to the definitions in this regulation allow for easier comprehension, thereby providing better protection by eliminating misunderstanding.

2.503 Turbidity

Removal of the word "ambient" allows for more turbidity data to be taken into consideration for impaired waterbodies assessments. Additional turbidity data will enhance ADEQ's decision making and management practices of the state's waterbodies.

2.504 pH

Clarifies depth at which to measure lake pH and prohibits a mixing zone for pH, except as exempted under 40 C.F.R. § 133.201(c).

2.505 Dissolved Oxygen

The reformatting of this regulation allows for easier comprehension, thereby providing better protection by eliminating misunderstanding.

2.507 Bacteria

The reformatting of this regulation allows for easier comprehension, thereby providing better protection by eliminating misunderstanding.

2.508 Toxic Substances

Allows for continued protection of waterbodies from toxic substances. This revision clarifies the intent of the regulation and allows for easier comprehension, thereby providing better protection by eliminating misunderstanding.

2.509 Nutrients

Establishes water quality standards for the protection of Northwest Arkansas's major drinking water source; Beaver Lake provides drinking water to over40,000 Arkansans.

2.510 Oil and Grease

Allows for continued protection of waterbodies from oil and grease. This revision clarifies the intent of the regulation and allows for easier comprehension, thereby providing better protection by eliminating misunderstanding.

2.511(A) Mineral Quality

1., 2., 3. The revision of this regulation allows for easier comprehension, thereby providing better protection by eliminating misunderstanding.
4. Allows for continued protection of the ERW designated portion of Bayou Two Prairie that runs thru the Smoke Hole Natural Area. The Arkansas Natural Heritage Commission is responsible for designating Natural Areas in the state.

2.511(B) Mineral Quality

The revision of this regulation allows for easier comprehension, thereby providing better protection by eliminating misunderstanding.

2.511(C) Mineral Quality
The revision of this regulation allows for easier comprehension, thereby providing better protection by eliminating misunderstanding.

Appendix A
The revision of this Regulation allows for easier comprehension, thereby providing better protection by eliminating misunderstanding. Inclusive listings of those Threatened and Endangered aquatic species whose habitat is protected under the ESW designated use allows for a more inclusive review by ADEQ and other agencies.

Appendix C
The revision of this Regulation allows for a fuller understanding of those Threatened and Endangered aquatic species whose habitat is protected under the ESW designated use by providing a listing of the scientific names.

Appendix D
The revision of this Regulation allows better protection by eliminating misunderstanding concerning which waterbodies are designated as an ERW, ESW, or NSW.

Sources and Assumptions:
Beaver Lake Site-Specific Water Quality Criteria Development: Recommended Criteria, prepared by FTN-Associates, Ltd., February 8, 2008
http://www.bwdh2o.org/

3. What detrimental effect will there be to the environment or to the public health and safety if this proposed rule is not implemented?

The proposed changes are necessary to ensure that existing uses and designated uses for waters of the State, and the water quality necessary to protect those uses, are protected and maintained.

2.104 Policy for Compliance
No detrimental environmental or public health and safety effects would be noted.

2.106 Definitions
Critical flow definition
Potential degradation of water quality in waters which receive discharges whose effluent contains Cl, SO4, and TDS, due to use of an inaccurate stream flow.

2.106 Definitions
No detrimental environmental or public health and safety effects would be noted.

2.302 Definitions
Misunderstanding in the interpretation of the designated use could lead to inadequate protection for the "shellfish and other forms of aquatic biota" protected by the designated use.

2.304 Physical Alteration of Habitat

The current language has not been approved by EPA for use as water quality standard; therefore, if the language remains in the regulation, it could be confusing to the public and regulated entities that rely on the regulation. After extensive discussion with stakeholder, ADEQ proposes a return to earlier language that has been previously approved by the Commission and EPA.

2.401 Applicability

Misunderstanding in the application of the general standards (Chapter 4) applicable to most waters could lead to inadequate protection of those waters with site specific standards.

2.402 Nuisance Species

No detrimental environmental or public health and safety effects would be noted.

2.404 Mixing Zones

Inappropriate application of mixing zone procedures could result in the degradation of water quality.

2.405 Biological Integrity

Requiring ADEQ to perform all biological studies would result in a large decrease in the biological data available for evaluation due to limitations in personnel and resources. Fewer biological studies could result in missed opportunities to evaluate degradation of water quality.

2.409 Toxic Substances

No detrimental environmental or public health and safety effects would be noted.

2.501 Applicability

Misunderstanding in the application of the specific standards (Chapter 5) applicable to most waters could lead to inadequate protection of those waters with site specific standards.

2.502 Temperature

Inconsistencies in the collection of lake samples could lead to misunderstandings in the interpretation of lake temperature data and could lead to inappropriate permitting practices and unprotected waterbodies, resulting in more waterbodies being impaired or failing to meet their designated uses.

2.503 Turbidity

Fewer turbidity data points could result in missed opportunities to assess degradation of water quality due to turbidity. Unassessed increases in turbidity could result in degradation of aquatic habitat. Inconsistencies in the collection of lake samples could lead to misunderstandings in the interpretation of lake turbidity data and could lead to inappropriate permitting practices and unprotected waterbodies, resulting in more waterbodies being impaired or failing to meet their designated uses.

2.504 pH

No detrimental environmental or public health and safety effects would be noted.

2.505 Dissolved Oxygen

Misunderstanding in the interpretation of the dissolved oxygen regulation could lead to inappropriate permitting practices and unprotected waterbodies. Inconsistencies in the collection of lake samples could lead to misunderstandings in the interpretation of lake dissolved oxygen data and could lead to inappropriate permitting practices and undprotected waterbodies, resulting in more waterbodies being impaired or failing to meet their designated uses.

2.507 Bacteria

Misunderstanding in the interpretation of the bacteria regulation could lead to inappropriate permitting practices and unprotected waterbodies. Inconsistencies in the collection of lake samples could lead to misunderstandings in the interpretation of lake bacteria data and could lead to inappropriate permitting practices and unprotected waterbodies, resulting in more waterbodies being impaired or failing to meet their designated uses.

2.508 Toxic Substances

Misunderstanding in the interpretation of the toxic substances regulation could lead to inappropriate permitting practices and unprotected waterbodies, resulting in more waterbodies being impaired or failing to meet their designated uses.

2.509 Nutrients

Without this proposed rule, there is a potential for increases in nuisance algae species leading to an increase in taste and odor issues in a major drinking water source. Beaver Lake is already experiencing high turbidity/sediment inflows and taste and odor problems due to blue-green algae. Past and present water quality problems indicate that the current water quality criteria are not adequate to protect Beaver Lake from being impacted by nutrients or sediment/turbidity. For example, the current turbidity standard for all reservoirs in Arkansas is 25 NTUs. This value has a water clarity depth of less than two feet. For a deep clear water lake, used for recreation and as a public water supply, a water clarity depth of less than 24 inches is not suitable. With current water quality criteria, Beaver Lake could be severely impacted before it would be listed on the impaired waterbody list. Continuation of these issues could lead to impairment of designated uses, such as drinking water or recreational uses.

2.511(A) Mineral Quality

1., 2., 3. Misunderstanding in the interpretation of the minerals regulation could lead to inappropriate permitting practices and unprotected waterbodies, resulting in more waterbodies being impaired or failing to meet their designated uses.
4. Potential degradation of water quality in the portion of Bayou Two Prairie designated as an Extraordinary Resource Water.

2.511(B) Mineral Quality

Misunderstanding in the interpretation of the minerals regulation could lead to inappropriate permitting practices and unprotected waterbodies, resulting in more waterbodies being impaired or failing to meet their designated uses.

2.511(C) Mineral Quality

Misunderstanding in the interpretation of the minerals regulation could lead to inappropriate permitting practices and unprotected waterbodies, resulting in more waterbodies being impaired or failing to meet their designated uses.

Appendix A

Misinterpretation of the representations in the old map format could lead to lessened protection of waterbodies designated as ERW, ESW, NSW, or trout waters. Misinterpretation of the extent of waters in which site specific standards variations or site specific designated use variations have occurred could lead to inappropriate assessment of these water's leading inappropriate management decisions.

Appendix C

No detrimental environmental or public health and safety effects would be noted.

Appendix D

No detrimental environmental or public health and safety effects would be noted.

Sources and Assumptions:

State of Arkansas Nutrient Criteria Development Plan, 2008

4. What risks are addressed by the proposal and to what extent are the risks anticipated to be reduced?

Risks for potential degradation of water quality and aquatic habitat, as discussed in the section on positive economic impacts.

Sources and assumptions:

See above.