

EXHIBIT F-2

EXHIBIT A

List of Commenters for Reg. 2 2010 Triennial Review

Written

Arkansas Department of Environmental Quality (ADEQ)
Arkansas Environmental Federation Water Committee (AEF)
Arkansas Natural Heritage Commission (ANHC)
Arkansas Department of Health (ADH)
Beaver Water District (BWD)
Central Arkansas Water (CAW)
Eldorado Chemical Company (EDCC)
Environmental Protection Agency (EPA)
Friends of the North Fork and White Rivers
Allan Gates
GBMc & Associates Ltd.
Georgia Pacific LLC
Dr. Richard Grippo
League of Women Voters of Arkansas
Northwest Arkansas Council
Ouachita Riverkeeper
The Ozark Society
River Valley Regional Water District (RVRWD)
Siloam Springs
Southwestern Electric Power Company (SWEPCO)
Tim Klinger

Oral

Dr. Robert Morgan – Beaver Water District
Larry Kelly – Arkansas Realtors Association
Mary Alice Seraphina – League of Women Voters of Arkansas & Washington County
Colene Gaston – Beaver Water District
Larry Lloyd – Beaver Water
Dr. Richard Grippo
Martin Maner – Central Arkansas Water

List of Revisions to Draft Reg. No. 2 Based on Public Comments

Chapter One, Page Numbering (page 1-1)

Revisions to the Chapter 1 page numbers were made such that the first page is numbered 1-1.

Reg.2.106, Definitions (Critical Flows) (page 1-3)

- The phrase “a permittee may use” will be removed.
- The third sentence leading into the various flow definitions will be revised to state: For all other standards use the critical flow of Q7-10.
- The portion of the definition referring the waters in Reg. 2.511 noted with an asterisk will be retained.

Reg.2.106, Definitions (Critical Flows) (page 1-3)

This section will read: For minerals criteria – harmonic mean flow or 4 cfs, except in those waters listed in Reg.2.511. Those waters in Reg.2.511 which are noted with an asterisk will have a critical flow of 4 cfs.

For waters listed as Extraordinary Resource Waters, Ecologically Sensitive Waters, or waters impaired for minerals, use harmonic mean flow.

Reg.2.106, Definitions (Maximum Contaminant Level (MCL)) (page 1-5)

The definition for Maximum Contaminant Level will be revised to state: The highest level of a contaminant that is allowed in drinking water. Maximum contaminant levels are set as close to maximum contaminant level goals as feasible using the best available treatment technology and taking cost into consideration.

Reg.2.106, Definitions (Nonpoint source) (pages 1-6)

The definition for Nonpoint source will be revised to state: 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), agricultural or silvicultural runoff, irrigation return flows, and other sources of diffuse runoff.”

Reg.2.106, Definitions (Primary Season Critical Flow) (page 1-6)

The primary season critical flow definition will remain in the regulation.

Reg.2.304, Physical Alteration of Habitat (page 3-6)

EPA did not approve the changes to Reg.2.304 that were adopted by the Commission in the 2007 Triennial Review, therefore the previously approved language (2004) will remain in the regulation.

Reg.2.404, Mixing Zones (page 4-1)

The language present in the October 26, 2007 Regulation No. 2 will be retained.

Reg.2.503, Turbidity (page 5-2)

The paragraph will be revised as follows: There shall be no distinctly visible increase in turbidity of receiving waters attributable to municipal, industrial, agricultural, other waste discharges or instream activities. Specifically, in no case shall any such waste discharge or instream activity cause turbidity values to exceed the base flows values listed below. Additionally, the non-point

FINANCIAL IMPACT STATEMENT

PLEASE ANSWER ALL QUESTIONS COMPLETELY

DEPARTMENT: Arkansas Department of Environmental Quality
DIVISIONS: Water Division
PERSON COMPLETING THIS STATEMENT: Jamie Ewing, Attorney Specialist
TELEPHONE NO.: 501-682-0892 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, Water Quality Standards

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

This proposed rule will most likely have both negative and positive financial impacts.

These proposed water quality standards revisions will have several positive economic effects from continued protection of the waters of the State of Arkansas, benefiting industry, tourism, recreational and domestic water supply usages. These proposed water quality standards revisions may also have a negative economic effect on the permitted facilities, based on revisions in the minerals and nutrient regulations.

Economic Earnings from Clean Water

In general, these proposed water quality standards revisions will have a positive economic effect from continued protection of waters of the State of Arkansas, benefiting industry, tourism, recreational and domestic water supply usages. Arkansas has over 699,293 acres of surface water, with some 11,900 miles of streams and rivers and more than 500,000 acres of lakes. Over 800 billion liters of high quality ground water are contained in aquifers capable of yielding over 2,000 liters per minute. As per the 2010 Integrated Water Quality Monitoring and Assessment Report (305(b)), over 60% of Arkansas's assessed surface waters are fully supporting their designated uses.

Fishing and Aquaculture Benefits

Arkansas is renowned for fishing and aquaculture. Specifically, Arkansas ranks second in the U.S. in catfish production, and leads the nation in baitfish, goldfish, sport-fish, largemouth bass, hybrid striped bass, and Chinese carp production. Aquaculture has a total economic impact of over \$1.1 billion in Arkansas, primarily in the Delta region.

According to USFWS, warmwater fish stocked for recreational fishing, such as smallmouth bass, striped bass and walleye, have a tremendous economic impact. Recreational fishing is a major tourist attraction for Arkansas contributing \$446 million to the State's economy annually through direct expenditures. In 2001, 782,000 people (residents and non-residents) over the age of 16 fished a total of more than 13,000 days. They spent almost \$184 million on trip-related expenses, and almost \$208 million on equipment.

USFWS estimates that the number of people fishing for trout in Arkansas multiplied by the number of days per year that each person fished ("angler days") is over 1.5 million, which represents 39% of the total estimate for trout fishing in all US waterbodies stocked with trout from national fish hatcheries (USFWS 2005).

USFWS estimated statewide economic benefits from trout fishing in Arkansas during 2004 to be, approximately \$62.9 million in retail sales, \$112.7 million in industrial output, and \$28.3 million in job income. Trout fishing in Arkansas generated approximately \$3.8 million in sales and motor fuel taxes, \$1.4 million in state income tax, and \$2.9 million in federal income tax during 2004 (USFWS 2005).

Thus, aquaculture and fishing, which benefit directly from water quality, provide \$1.456 billion in direct and indirect benefits to the State of Arkansas.

Hunting Benefits

The most recent year for which data exists regarding the economic impact of hunting is 2001. In that year, Arkansas had 430,694 registered hunters with an economic impact for all hunting-related activities of \$905,815,861 based on direct, indirect, and induced effects. The impact of deer hunting during that period was \$383,007,221 and the economic impact of migratory waterfowl and upland bird hunting was \$270,286,245. A significant portion of the deer and migratory waterfowl industry benefits from and is dependent upon well managed water resources. A conservative estimate of the benefit derived from high quality water for those two hunting components would be 50 percent, resulting in a direct benefit of approximately \$327 million in total benefit from hunting.

Eco-Tourism Benefits

Eco-tourism in Arkansas is calculated as the combination of watchable wildlife recreation (particularly bird watching) and general tourism less special attractions, hunting, fishing, and historic tourism. For 2001, the most recent year for which data is available, 841,000 people participated in watchable wildlife activities. The total economic benefit of wildlife-watching in Arkansas in 2001 was almost \$456 million, most of which was for retail sales.

The Arkansas tourism industry experienced a year of record growth in 2004, with travel expenditures increasing from \$3.9 billion to \$4.3 billion (7.9%) and visitors increasing from 19.7 million to almost 21 million. These estimates are calculated using the Travel Industry Association of America (TIA) 2001 Impact of Travel on Arkansas Counties as a reference. During 2004, visitors to Arkansas totaled 20.7 million person-trips. Visitors spent an average of \$205.60 per trip, resulting in \$4.3 billion in total travel expenditures, \$238 million in state taxes and \$89 million in local taxes. The Arkansas travel industry employed 59,287 persons and paid \$940 million in wages and salaries. A conservative estimate of the economic benefit derived from well-managed water resources to eco-tourism would be half of all eco-tourism, or 13 percent of the total, for an economic benefit of more than \$553 million plus half of bird-watching, \$237 million, for a total impact of \$790 million. The perception of clean water is central to the advertising campaign of Arkansas as the "Natural State."

Water-Critical Industry Benefits

The principal industries in Arkansas are manufacturing, agriculture, forestry, business services, and tourism accounted (in 2004) for over \$12 billion dollars of state revenue. These industries are dependent upon, and thus benefit from, high quality water resources. However, a conservative estimate of the benefit of implementing the CWA, 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 for high quality water. The benefit to industries in Arkansas from implementing the CWA was estimated to be \$1,049 million.

Summary of Benefits

The cumulative benefits of implementing CWA programs in Arkansas for FY 2005 were estimated to be more than \$3.7 billion. These benefits are estimates made with assumptions; however, these assumptions were conservative (that is, likely underestimated) and based upon the most recent data available. In

addition, these estimates do not consider other critical benefits that were not available for this cost benefit analysis.

Economic Savings from Clean Water

Additionally utility users will not sustain negative effects by 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 (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. Costs for treatment of T & O control ranged from \$37.7 million to \$83.8 million resulting in wholesale rate increases of \$0.27 to \$0.61 per 1000 gallons respectively.

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.

*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.*

Potential Economic Costs due to Revisions

Negative impacts could include stricter monitoring requirements or limits for minerals. Entities with minerals discharge may incur increased cost of monitoring Cl, SO₄, and TDS. Estimated cost for analysis for these parameters is \$20.00 per parameter per sample.

In order to meet stricter permit limits for minerals, permittees may implement additional treatment. Reverse osmosis (RO) treatment is capable of removing chlorides, sulfates, and TDS. Capital costs of installing a three stage RO treatment system handling an average of 1,500 gpm of water for a municipal wastewater facility have been estimated as follows:

Capital cost \$6,500,000

Annual operating cost \$4,400,000

Entities with stricter monitoring requirements for nutrients may incur increased cost of monitoring TN and TP. Estimated cost for analysis for these parameters is \$28.00 per sample for TP and \$82.00 per sample for TN.

Failure to meet any permit limits may result in a formal enforcement action including the assessment of civil penalties.

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

Numerous factors influence costs to each individual point source discharger. These factors 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; economic viability of surrounding region. Additionally, EPA does not consider cost for aquatic life criteria during development or when applying to an NPDES permit.

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

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 Clean Water Act ("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. Thus, implementation of the federal rule is anticipated and there are no additional costs at this time.

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

Current Fiscal Year

Next Fiscal Year

Please see the answer to #2, above. Total costs are too speculative to estimate at this time.

5. What is the total estimated cost by fiscal year to the agency to implement this regulation?

Current Fiscal Year

Next Fiscal Year

Please see the answer to #3, above. There are no additional costs to the agency to implement this rule.

**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

Contact/Phone/Electronic mail: Ryan Benefield, Deputy Director
Steve Drown, Chief, Water Division
Jamie Ewing, Attorney Specialist, Legal Division
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Analysis Prepared by: Water Planning, Water Division, ADEQ

Date Analysis Prepared: October 5, 2010

The following Regulations are exempt from this economic impact and environmental benefit analysis according to Reg. 8.812(A)(4) which states “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. 2.106 Definitions- definitions for: 304(a) Guidance, Algae, Criterion Continuous Concentration (CCC), Criterion Maximum Concentration (CMC), Department, Design Flow, Existing Uses, Groundwater, Harmonic mean flow, Maximum contaminant level (MCL), Milligrams per liter, Mixing zone, Natural background, Nephelometric Turbidity Unit (NTU), Nonpoint Source, Primary Season Critical Flow, Q7-10, and State of Arkansas Continuing Planning Process
Reg. 2.202 High Quality Waters
Reg. 2.203 Outstanding Resource Waters
Reg. 2.204 Thermal Discharges
Reg. 2.302 Designated Uses
Reg. 2.303 Use Attainability Analysis
Reg. 2.306 Procedures for Removal of Any Designated Use Except Fishable/Swimmable,
Reg. 2.310 Procedure for the Removal of the Designated Use of Extraordinary Resource Water...
Reg. 2.311 Procedure for the Addition of the Designate Use of Extraordinary Resource Water ...
Reg. 2.401 Applicability
Reg. 2.402 Nuisance Species
Reg. 2.404 Mixing Zones
Reg. 2.409 Toxic Substances
Reg. 2.501 Applicability
Reg. 2.505 Dissolved Oxygen
Reg. 2.512 Ammonia

The following Regulations are not exempt from this economic impact and environmental benefit analysis.

- Reg. 2.106 Definitions- definition for: Critical flows
- Reg. 2.304 Physical Alteration of Habitat
- Reg. 2.405 Biological Integrity
- Reg. 2.503 Turbidity
- Reg. 2.504 pH
- 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
- Appendix A – Designated Uses, Specific Standards and Maps of Waters of the State ...

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 from continued protection of waters of the State of Arkansas, benefiting industry, tourism, recreational and domestic water supply usages. Arkansas has over 699,293 acres of surface water, with some 11,900 miles of streams and rivers and more than 500,000 acres of lakes. Over 800 billion liters of high quality ground water are contained in aquifers capable of yielding over 2,000 liters per minute. As per the 2010 Integrated Water Quality Monitoring and Assessment Report (305(b)), over 60% 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	6025.1	61.57
Not supporting a use	3761.1	38.43
Total Waters Assessed	9786.2	

Economic Earnings from Clean Water

According to the Cost Benefit Analysis prepared for FY 2005, the costs for implementing the Clean Water Act, 33 U.S.C. § 1251 et seq. (CWA), in Arkansas were approximately \$13.86 million, and benefits were \$3.712 billion. Thus, the State of Arkansas received more than 267 times return on each dollar invested in implementing the CWA in FY 2005.

Specifically, the benefit to industries in Arkansas from implementing the CWA was estimated to be \$1.049 billion. According to the Bureau of Economic Analysis, U.S. Department of Commerce, Arkansas's annual Gross Domestic Product from 1997-2008 ranged from \$2.9-3.3 million for agriculture, forestry, fishing, and hunting industries. All of which are directly impacted by water quality.

Fishing and Aquaculture Benefits

Arkansas is renowned for its year round fishing. Recreational fishing is a major tourist attraction for Arkansas contributing \$446 million to the State's economy annually through direct expenditures.

Arkansas is an important state nationally for aquaculture. In fact, Arkansas is the birthplace of warm-water aquaculture in the United States (see link from Encyclopedia of AR). The first commercial fish farms were built in Arkansas in the 1940s to raise goldfish. Arkansas ranks second in the U.S. in catfish production, and leads the nation in baitfish, goldfish, sport-fish, largemouth bass, hybrid striped bass, and Chinese carp production. Aquaculture has a total economic impact of over \$1.1 billion in Arkansas, primarily in the Delta region. In Chicot County alone, the catfish industry accounted for 2,665 jobs and \$22 million in tax revenue.

Warm-water (smallmouth bass, striped bass, and walleye), and cold-water (trout) fisheries is another economically important industry for Arkansas. Arkansas has five hatcheries operated by the AR Game and Fish Commission (AGFC) and three National Fish Hatcheries (NFH). According to the US Fish and Wildlife Service (USFWS), for every dollar spent by Norfolk NFH, \$94.98 is generated with a total economic output of \$90.4 million (2010 dollars). For every tax dollar spent for recreational fish production at Mammoth Spring NFH \$12 of net economic value is created resulting in a total economic output of more than \$1.5 million every year. Greers Ferry produces an annual economic impact of \$45.7 million (1999 dollars) between Arkansas and Oklahoma. That's over \$117 million.

In the report, TMDLS for Dissolved Oxygen for White River below Bull Shoals Dam and North Fork River below Norfolk Dam, FTN Associates, Ltd. discussed the economic benefits of a healthy trout population. Their report, quoting information from the USFWS, stated that "estimates [of] the number of people fishing for trout in Arkansas multiplied by the number of days per year that each person fished ("angler days") is over 1.5 million, which represents 39% of the total estimate for trout fishing in all US waterbodies stocked with trout from national fish hatcheries (USFWS 2005).

Thus, aquaculture and fishing, which benefit directly from water quality, provide \$1.456 billion in direct and indirect benefits to the State of Arkansas.

Hunting Benefits

The most recent year for which data exists regarding the economic impact of hunting is 2001. In that year, Arkansas had 430,694 registered hunters with an economic impact for all hunting-related activities of over \$905 million based on direct, indirect, and induced effects. The impact of deer hunting during that period was over 42 percent of the total value, or over \$383 million. The economic impact of migratory waterfowl and upland bird hunting was almost 30 percent of the total, or over \$270 million. Significant portions of the deer and migratory waterfowl industry benefits from and is dependent upon well managed water resources. A conservative estimate of the benefit derived from high quality water for those two hunting components would be 50 percent, resulting in a direct benefit of approximately \$327 million in total benefit from hunting.

Eco-Tourism Benefits

Eco-tourism in Arkansas is calculated as the combination of watchable wildlife recreation (particularly bird watching) and general tourism less special attractions, hunting, fishing, and historic tourism. For 2001, the most recent year for which data is available, 841,000 people participated in watchable wildlife activities in Arkansas, and the total economic benefit was almost \$456 million, most of which was for retail sales (Table 2).

The Arkansas tourism industry experienced a year of record growth in 2004, with travel expenditures increasing from \$3.9 billion to \$4.3 billion (7.9%) and visitors increasing from 19.7 million to almost 21 million. These estimates are calculated using the Travel Industry Association of America (TIA) 2001 Impact of Travel on Arkansas Counties as a reference. During 2004, visitors to Arkansas totaled 20.7 million person-trips. Visitors spent an average of \$205.60 per trip, resulting in \$4.3 billion in total travel expenditures, \$238 million in state taxes and \$89 million in local taxes. The Arkansas travel industry employed 59,287 persons and paid \$940 million in wages and salaries. A conservative estimate of the economic benefit derived from well-managed water resources to eco-tourism would be half of all eco-tourism, or 13 percent of the total, for an economic benefit of more than \$553 million plus half of bird-watching, \$237 million, for a total impact of \$790 million. The perception of clean water is central to the advertising campaign of Arkansas as the "Natural State."

Table 2: 2001 Economic Benefits of Watchable Wildlife Recreation in Arkansas

	Resident	Non-Resident	Total
Retail sales	\$232.0 million	\$11.9 million	\$244.0 million
Salaries & wages	\$101.2 million	\$4.8 million	\$106.0 million
Full & part-time jobs	4,532	238	4,770
Tax revenues:			
State sales tax	\$12.0 million	\$957,000	\$12.9 million
State income tax	\$5.0 million	\$260,000	\$5.2 million
Federal income tax	\$14.9 million	\$783,000	\$15.7 million
Total economic effect	\$454.1 million	\$21.7 million	\$475.7 million

Water-Critical Industry Benefits

The principal industries in Arkansas are manufacturing, agriculture, forestry, business services, and tourism (Table 3). These industries are dependent upon, and thus benefit from, high quality water resources. A conservative estimate of the benefit of implementing the CWA, 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 for high quality water. The benefit to industries in Arkansas from implementing the CWA was estimated to be \$1.049 billion.

Table 3: Economic Benefits from Industries in Arkansas by Category, 2004

Industry Category	2004 Revenues (million)	Percent GSP (\$80.902 billion)
Agriculture, Forestry & Fishing	\$3,154	3.9
Nondurable Goods Manufacturing Industry	\$7,095	8.8
Accommodation and Food Services Industry	\$1,784	2.2
TOTAL	\$12,033	14.9

Summary of Benefits

The cumulative benefits of implementing CWA programs in Arkansas for FY 2005 were estimated to be more than \$3.7 billion (Table 4). These estimates were conservative (that is, likely underestimated) and based upon the most recent data available. In addition, these estimates do not consider other critical benefits that were not available for this CBA, including 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 CWA Programs in Arkansas for FY 2005.

Economic Source	Principal Activities	Economic Benefits (Million)
Fishing	Aquaculture and recreational fishing	\$1,546
Hunting	Migratory waterfowl and riparian game (deer, upland game birds)	\$327
Eco-tourism	Bird watching, recreational water sports, etc.	\$790
Water-Critical Industries	Agriculture, forestry, manufacturing, accommodations, etc.	\$1,049
	TOTAL	\$3,712

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

2.106

a) This proposed rulemaking will affect those entities permitted or seeking permits to discharge minerals in waters designated as ERWs or ESWs or waters listed as impaired for minerals. This proposed rule will result in a positive economic effect for those entities discharging to watersheds greater than ten square miles, as permit limits for minerals could be less stringent. This proposed rule may result in a negative economic effect for those entities discharging to watersheds less than ten square miles, as permit monitoring and/or limits for minerals could be more stringent.

b) It is estimated that there are currently approximately 115 entities with individual NPDES permits that discharge into a water designated as ERW, ESW, or listed as impaired for minerals.

2.304

a) This proposed rulemaking will not affect any specific public and/or private entities. This proposed rule reverts back to the previously approved 2004 language.

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

2.405

a) This proposed rulemaking will have no added burden to permitted entities. The revision in 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...". If this language is not removed, Regulation No. 2.405 will remain in violation of 40CFR 130.7(5). It would continue to prohibit the use of outside data and force ADEQ into nullifying any and all previous determination that have occurred using data collected by outside entities. This would include all third party rule makings that have occurred since the adoption of this language in 2004. In addition, leaving this language in the regulation would require ADEQ to perform all biological assessments as they relate to standards changes, thus drastically changing the third party rule making process. This would result in enormous delays in the rule making process because the small staff and limited resources of ADEQ are not equipped to handle the potential additional work load. As a result, standards revisions would not keep pace with permitting; permits would be issued with more stringent limits; and point source dischargers would be required to implement additional treatment options to meet the more stringent permit limits. Not removing this language will have an enormous economic impact on the point source discharger community.

b) It is estimated that every two years ADEQ solicits data from approximately 17 entities when preparing the most recent update of the 303(d) list and 305(b) report.

If the previous language remains, approximately ten facilities may be negatively impacted by the nullifying of all third party rule makings that have occurred since the adoption of this language in 2004.

2.503

a) This proposed rulemaking will not affect any specific public and/or private entities. 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 of turbidity.

b) ADEQ will be the only entity affected.

2.504

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

b) Currently there are no waterbodies shown to have natural background conditions resulting in pH values of either less than or greater than the criteria listed.

2.507

a) This proposed rulemaking will not affect any specific public and/or private entities. This proposed rule only reformats the regulation for ease of reading.

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

2.508

a) This proposed rulemaking will not affect any specific public and/or private entities. This proposed rule only removes "shall not exceed" type language. 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. This proposed rule will more accurately reflect ADEQ's Assessment Methodology.

b) ADEQ will be the only entity affected.

2.509

a) This proposed rulemaking will affect those entities permitted or seeking permits to discharge into Beaver Lake. Entities with individual NPDES permits may receive more stringent permit monitoring and/or limits.

This proposed rule will result in a positive economic effect in that the drinking water source will be further protected. This further protection may negate the need for further treatment practices in the future. If taste and odor events were to continue and ozonation and activated carbon treatment were added, water customers would see a wholesale rate increase of \$0.32 per thousand gallons.

b) It is estimated that there are currently approximately four entities with individual NPDES permits that discharge into Beaver Lake. There are over 250,000 people and industries that rely on Beaver Lake as a drinking water source.

2.510

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

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

2.511(A)

a) 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. The portion of Bayou Two Prairie that flows thru the Smoke Hole Natural Area is designated as an Extraordinary Resource Water. Entities that discharge into a waterbody designated as an ERW may be negatively affected by stricter permit limits.

b) Currently there are no entities that discharge directly into the segment of Bayou Two Prairie that is designated as an ERW. It is estimated that there are currently approximately 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 contained a table of Ecoregion Reference Stream Values and the text describing how to calculate the ecoregion reference stream values. In the October 26, 2007 version of Regulation No. 2 these ecoregion reference stream values were calculated out in the table, however the text describing how to calculate the ecoregion reference stream values was inadvertently left in the document. In 2007, EPA disapproved of the Calculated Ecoregion Reference Stream Values (Regulation 2.511(B) table because it retained the previous text describing the calculations and because the text references the now revised table. Ecoregion chloride, sulfate, and total dissolved solids criteria associated with Regulation 2.511 had been effectively revised 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 from the 2004, 2007 or the proposed 2010 versions, there will be no entities affected by this proposed rule.

Appendix A

- a) *This proposed rulemaking will not negatively affect any specific public and/or private entities. These proposed revisions to Appendix A will make the document easier to understand and make use of the most up to date GIS data.*
- b) *There will be no entities affected by this proposed rule.*

Sources and Assumptions (for all of the above):

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 October 26, 2007.

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

2006 Integrated Water Quality Monitoring and Assessment Report, Prepared pursuant to Sections 305(b) and 303(d) of the Federal Water Pollution Control Act

2008 Integrated Water Quality Monitoring and Assessment Report, Prepared pursuant to Sections 305(b) and 303(d) of the Federal Water Pollution Control Act

2010 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.

Costs of Water Treatment due to diminished water quality: a case study in Texas. 1997

The 2001 Economic Benefits of Watchable Wildlife Recreation in Arkansas (Report prepared for the Arkansas Game and Fish Commission.) (Table 2)

Arkansas Department of Economic Development, Bureau of Economic Analysis (Table 3)

<http://encyclopediaofarkansas.net/encyclopedia/entry-detail.aspx?entryID=3640>

<http://www.fws.gov/southeast/pubs/facts/norcon.pdf> (Norfork data)

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

<http://www.fws.gov/mammothspring/aboutus.html> (Mammoth Spring data)

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.

2.106

1) *Entities discharging minerals into waters designated as ERWs or ESWs or waters listed as impaired for minerals may have stricter monitoring and/or permit limits. 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.*

Entities with stricter monitoring requirements for minerals may incur increased cost of monitoring Cl, SO₄, and TDS. Estimated cost for analysis for these parameters is \$20.00 per parameter per sample.

In order to meet stricter permit limits for minerals, permittees may implement additional treatment. Reverse osmosis (RO) treatment is capable of removing chlorides, sulfates, and TDS. Capital costs of installing a three stage RO treatment system handling an average of 1,500 gpm of water for a municipal wastewater facility have been estimated as follows:

Capital cost \$6,500,000

Annual operating cost \$4,400,000

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.*

2.304

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.*

2.405

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.*

2.503

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.*

2.504

1) *Entities discharging into waters that can be shown to have natural background conditions resulting in pH values of either less than or greater than the criteria may have less stringent permit limits. This would allow for potential saving to these entities. Savings may be incurred by not having a formal enforcement action.*

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

2.507

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

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

1) *Entities discharging into Beaver Lake may have stricter permit monitoring and/or limits. 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.*

Entities with stricter monitoring requirements for nutrients may incur increased cost of monitoring Total Nitrogen (TN) and Total Phosphorus (TP). Estimated cost for analysis for these parameters is \$28.00 per sample for TP and \$82.00 per sample for TN.

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.*

2.510

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)

1) *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 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.*

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)

- 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.*

Sources and Assumptions (for all of the above):

Arkansas Regulations Department of Pollution Control and Ecology Regulation No. 7 -- Civil Penalties

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

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 CWA, Arkansas has been delegated the authority to establish and administer water quality standard. 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.

Sources and Assumptions:

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

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. 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) (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.

2.106

Minerals criteria for waterbodies designated as an ERW, ESW or impaired for minerals

2.304

Physical alteration of habitat in waterbodies designated as ERW, ESW, or NSW

2.405

The collection of biological data for aquatic biota assessments

2.503

The collection and assessment of turbidity data

2.504

pH values in waterbodies with natural background values below 6.0 or above 9.0

2.507

Appropriate interpretation of bacteria criteria

2.508

Continued protection of waters receiving toxic substances

2.509

Protection of drinking water sources

2.510

Continued protection of waters receiving oil and grease

2.511(A)

Protection of water quality in the segment of Bayou Two Prairie designated as an ERW

2.511(B)

Appropriate interpretation of ecoregion reference stream values

Appendix A

Use of most up-to-date waterbody GIS data

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.

2.106

Provides further protection for Extraordinary Resource Waters, Ecologically Sensitive Waters, and waters impaired for minerals. These designations are given to waters with high scientific, recreational, and social values, as well as waters inhabited by threatened, endangered or endemic aquatic species.

2.304

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

2.405

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.

2.503

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

Allows the potential for waterbodies to be designated as having natural background conditions higher or lower than the standards, therefore more accurately representing the natural conditions.

2.507

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

2.508

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

2.509

Establishes water quality standards for the protection of Northwest Arkansas's major drinking water source. Beaver Lake provides drinking water to over 250,000 Arkansans.

2.510

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

2.511(A)

Allows for continued protection of the portion of bayou Two Prairie that runs thru the Smoke Hole Natural Area that is designated as an ERW. The Arkansas Natural Heritage Commission is responsible for designating Natural Areas in the state.

2.511(B)

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

Appendix A

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

Sources and Assumptions:

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

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.

2.106

Potential degradation of water quality in waters designated as Extraordinary Resource Waters, Ecologically Sensitive Waters, and waters impaired for minerals.

2.304

The current language is unclear and could be misinterpreted allowing uncontrolled physical alterations of habitat within ERW, ESW, and NSW and loss of use by the citizens of Arkansas.

2.405

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

2.503

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.

2.504

No detrimental environmental effects would be noted.

2.507

Misunderstanding in the interpretation of the bacteria Regulation could lead to inappropriate permitting practices and under protected waterbodies.

2.508

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

2.509

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 loss of drinking water and/or recreational uses.

2.511(A)

Potential degradation of water quality in the portion of Bayou Two Prairie designated as an Extraordinary Resource Water.

2.511(B)

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

Appendix A

No detrimental environmental 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.

BEFORE THE ARKANSAS POLLUTION CONTROL AND ECOLOGY COMMISSION

IN THE MATTER OF AMENDMENTS TO)
REGULATION NO. 2, REGULATION ESTABLISHING) DOCKET NO. 10-002-R
WATER QUALITY STANDARDS FOR SURFACE)
WATERS OF THE STATE OF ARKANSAS)

**ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY'S
RESPONSIVE SUMMARY**

Pursuant to minute order 10-13 the Arkansas Department of Environmental Quality ("ADEQ" or "Department") submits the following Responsive Summary regarding proposed changes to Arkansas Pollution Control and Ecology Commission Regulation No. 2, Regulation Establishing Water Quality Standards for Surface Waters of the State of Arkansas.

Pursuant to the Federal Water Pollution Control Act (hereinafter "Clean Water Act"), 33 U.S.C. §1251 *et seq.*, Arkansas has been delegated the authority to establish and administer water quality standards. The Clean Water Act requires states to review their water quality standards on a triennial basis and to amend those standards as necessary. As a result of the triennial review process, ADEQ proposes to amend portions of Regulation No. 2.

On May 27, 2010, the Arkansas Pollution Control and Ecology Commission (hereinafter "APCEC" or "Commission") granted ADEQ's Petition to initiate Rulemaking to amend Regulation No. 2.

Four public hearings were held as follows: Fayetteville on July 13, 2010, Jonesboro on July 15, 2010, Arkadelphia on July 19, 2010 and North Little Rock on July 21, 2010. The deadline for submitting written comments on the proposed changes was August 4, 2010. The commission received twenty-one (21) written comments during the public comment period. Seven (7) individuals provided oral comments on the record during the public hearings. A list of individuals providing comments is attached as "Exhibit A."

The comments are grouped according to Regulation Section.

COMMENTS RELATED TO SPECIFIC REGULATIONS

Chapter One, Page Numbering

Siloam Springs

Comment: Page numbers in Chapter 1 appear to be incorrectly labeled.

Response: Revisions to the Chapter 1 page numbers will be made such that the first page will be numbered 1-1.

Reg.2:102, Purpose

Arkansas Department of Health (hereinafter "ADH")

Comment: Section 304(a) of the Clean Water Act requires the [U.S. Environmental Protection Agency] and the states to establish water quality criteria which will be protective of human

health in addition to protecting the environment. Regulation No. 2 is deficient in not following the requirements of the Clean Water Act to include the protection of public health as one of its stated purposes. It is also inconsistent with other parts of the Regulation, such as 2.106 and 2.508, which specifically reference public or human health. This section should be modified accordingly.

Response: The Department acknowledges this comment; however this type of revision to the water quality standards would require additional public notice and comment due to the potential interest of many parties. During this Triennial Review, this section of the regulation was not opened for public comment in the Department's proposed rulemaking. Pursuant to Regulation No. 8, the Commission's review of the proposed rulemaking is limited to the proposed changes submitted by the Department. See Reg.8.818, ("When amending portions of an existing regulation, the Commission's deliberations shall be restricted to those proposed amendments described in the public notice. Rulemaking proceedings concerning legally required periodic update of regulations shall be restricted to Department staff proposals."). The Department respectfully requests that ADH assist ADEQ in the development of this revised language prior to the next Triennial Review.

Reg.2.106, Definitions (Aquatic life, Perennial aquatic life, Seasonal aquatic life, Fishery, and Seasonal Fishery and Reg 2.302(F), Designated Use) (two similar comments)
Beaver Water District (hereinafter "BWD")

Comment: Definitions for Aquatic life, Perennial aquatic life, and Seasonal aquatic life were added and the definition for Fishery was deleted in the proposed amendments to Reg. 2 that were submitted to the APCEC in March 2010.... ADEQ's May 2010 version [of the proposed rulemaking], however, does not include these March 2010 changes. BWD suggests that the definitions regarding aquatic life be included and the definition for fishery and seasonal fishery be deleted in Reg.2.106, and that "aquatic life" replace "fisheries" as the applicable designated use in Reg.2.302(F). It is important that all aquatic life and not just fish be taken into consideration for the purpose of the water quality standards. This also would be in keeping with accepted scientific practice for water quality studies.

Arkansas Natural Heritage Commission (hereinafter "ANHC")

Comment: In the first draft version of the Regulation, a change in terminology from "fisheries" to "aquatic life" was noted. This change was subsequently removed from the final draft document. We believe the "aquatic life" terminology is more accurate and appropriate for the regulation. "Fishery" is a specific term with connotations related to the commercial or recreational harvest of fish. The water quality standards seek to protect the value of streams for fish and wildlife propagation. This must take into consideration the full range of aquatic life (plant and animal). We support the use of the term "aquatic life" for the Regulation.

Response: The Department acknowledges this comment but cannot consider this addition as it was not part of the final proposed rulemaking submitted by the Department and initiated for public comment by the Commission. Based on the number of responses received during the triennial review process, ADEQ has decided to delay this proposed revision until interested parties are able to fully express their interests. It was the intent of the Department to better reflect the definitions and language used in the Clean Water Act, and to be in line with the currently accepted language used by other environmental agencies and entities. U.S. Environmental Protection Agency (hereinafter "EPA") guidance documents define the designated use of aquatic

life as “a beneficial use designation in which the water body provides suitable habitat for survival and reproduction of desirable fish, shellfish, and other aquatic organisms.”

<http://water.epa.gov/scitech/swguidance/waterquality/standards/criteria/aqlife/biocriteria/useclass.cfm>

Reg.2.302(F) states that “[The fisheries designated use] provides for the protection and propagation of fish, shellfish and other forms of aquatic life.” Historically the Department has used these two terms interchangeably, for example in the 303(d) list, Use Attainability Analyses, etc.

The Department respectfully requests that BWD, ANHC, and other interested parties assist in the development of this revised language prior to the next Triennial Review.

Reg.2.106, Definitions (Critical Flows) and 2.511, Mineral Quality

ADEQ

After a brief review of the Site Specific Mineral Quality Criteria in Reg 2.511(A), it has become apparent that an in-depth investigation of how and when the 4 cfs critical background flow rule was applied to the various Use Attainability Analyses (hereinafter “UAA”) from which these Site Specific Mineral Quality Criteria were proposed is necessary. Due to the necessity of this investigation, the Department has decided not to make revisions to certain regulations concerning the 4 cfs critical background flow rule at this time.

- 1) Reg 2.106 – ADEQ proposed that the minerals criteria portion of the Critical Flows definition should read as follows:
For minerals criteria – harmonic mean flow or 4 cfs, except in those waters listed in Reg.2.511. Those waters in Reg.2.511 which are noted with an asterisk will have a critical flow of 4 cfs.
For waters listed as Extraordinary Resource Waters, Ecologically Sensitive Waters, or waters impaired for minerals, use harmonic mean flow.
- 2) Reg 2.511(A) – In the draft version the single asterisks (*) under 2.511(A) have been struck thru. ADEQ proposed to put the asterisk notations back into 2.511(A), along with the corresponding footnote that explains the asterisk means the criteria was “based on critical background flow of 4 cfs.”

Response: No response is necessary.

Reg.2.106, Definitions (Critical Flows)

Ouachita Riverkeeper

Comment: ADEQ removes the term “Critical Flows” from the Definitions section at Reg. 2.106 without substitution. ADEQ continued to use the term “critical flow” elsewhere in Regulation 2.

Response: In the first draft proposed regulation, the critical flow definition was removed from this regulation. Critical Flow is a component of implementing the minerals standards in NPDES permits. Procedures for the implementation of water quality standards in the permitting process are included in the State of Arkansas Continuing Planning Process (hereinafter “CPP”). In the second amended draft proposed rulemaking that was submitted by the Department and was initiated for public comment by the Commission, the definition for “critical flows” was retained. Based on the number of responses received during the triennial review process, ADEQ has decided to delay any proposed revision to the “critical flows” definition until interested parties are able to fully express their interests.

Reg.2.106, Definitions (Critical Flows)

BWD

Comment: This definition pertains to “background dilution flows” to be used in calculating NPDES permit limits. This definition should be based on actual flows and not on arbitrary, scientifically indefensible numbers such as the automatic four (4) cfs allowed for calculating limits for minerals or the one (1) cfs allowed for calculating permit limits involving seasonal fisheries. Where sufficient flow data does not exist, permittees should be required to conduct flow studies. Also, it would seem more appropriate that these definitions be included in Reg. 6.

Response: Mineral standards are viewed as more similar to human health criteria and are designed to protect against long-term exposure, which in some cases includes the lifetime of the organism. Minerals, in the low concentrations set forth in the water quality standards, do not cause discernable effects to the aquatic community. Rather, as mineral concentrations are modified from low to high concentrations over long periods of time, certain species may be impacted and usually disappear to be replaced by other species. This effect takes place over the long-term, chronological flow hydrograph instead of at short-term, low flow concentrations.

Criteria for long-term effects such as human health criteria for consumption of aquatic life are converted to permit limits by using a statistically determined flow condition where 30% to 50% of the time the instream concentration will be less than the criteria. EPA has determined that the critical flow condition for human health criteria should be derived by determining the harmonic mean flow for the receiving stream.

To treat minerals in a similar manner requires that some flow condition other than 7Q10 be considered in determining permit limits. Although several options are available, such as long term average, geometric mean, and percent flow exceedances, none had the advantage of EPA acceptability, other than harmonic mean.

Once harmonic mean flows were selected as the critical flow for minerals, all available flow data was grouped by ecoregion and analyzed to determine if a regression model could be constructed to accurately predict harmonic mean flows by drainage basin size. Unfortunately, there was not enough flow data available from small stream basins to accurately extrapolate to the small watershed streams upon which many dischargers are located. However, adequate flow data was available from medium and large size watersheds.

Regulation No. 2 requires that ecoregion-specific perennial stream fisheries designated uses must be maintained and protected in waters with a watershed size equal to or greater than 10 mi². A review of the limited number of flow data from the smallest watershed sizes within each ecoregion indicated that the median flow for 10 mi² watershed streams range from just less than 3 cfs to just over 7 cfs. Ecoregion averages were from about 3 to 5 cfs. Therefore, a statewide median flow of 4 cfs was selected to be used in place of harmonic mean flows where insufficient data exists to establish such flows.

Reg.2.106, Definitions (Critical Flows)

GBMc & Arkansas Environmental Federation (hereinafter "AEF") & El Dorado Chemical Company (hereinafter "EDCC") & Siloam Springs (submitted identical comments)

Comment: We recommend the deletion of "a permittee may" from both the human health and minerals criteria. The inclusion of "a permittee may" would appear to allow other parties (e.g. ADEQ or environmental groups) to consider other flows as the critical flows upon which permit limitations are based. The regulation should define the flow and eliminate all subjectivity.

Response: The phrase "a permittee may use" will be removed. However, for clarification, in the absence of sufficient data to establish a harmonic mean flow in small watersheds, a critical flow of 4 cfs will be used.

Reg.2.106, Definitions (Critical Flows) (two similar comments)

GBMc

Comment: The last section of this critical flow definition should be amended to read: "For all other criteria use the critical flow of Q7-10". The use of the term "waters" as is proposed is not appropriate and would result in no defined critical flow for aquatic life criteria.

AEF

Comment: The third sentence leading into the various flow definitions states: " These following critical flows are applicable:" The 1st three critical flows deal with uses and criteria, the last deals with "other waters". By applying the Q7-10 to "all other waters" ADEQ is, in effect, eliminating any low flow definition or applicability for other uses or criteria. For example, there are critical flow definitions for seasonal fishery, human health criteria, and mineral criteria; what critical flow should, for example, be used for aquatic life criteria, dissolved oxygen, or non-seasonal fisheries? AEF recommends that the existing definition be retained, i.e. "For all others - the critical flow will be Q7-10". This encompasses both the remaining uses and criteria.

Response: The Department agrees that the use of the term "waters" is not appropriate because the language in the three preceding statements refers to specific uses and criteria, not waters. According to 40 CFR131.3(i) "Water quality standards ... consist of a designated use or uses ... and water quality criteria..." This sentence will be revised to state, "For all other standards use the critical flow of Q7-10."

Reg.2.106, Definitions (Critical Flows) (four similar comments)

GBMc & AEF & Siloam Springs (submitted identical comments)

Comment: In addition the minerals criteria critical flow definition should be amended to read "harmonic mean flow or 4 cfs, whichever is greater" instead of the current language which reads "harmonic mean flow or 4 cfs". The 4 cfs needs to be the default value and there should not be any subjectivity. If the "whichever is greater" language is not added the current language should be retained including the use of the asterisks in Reg. 2.511.

AEF

Comment: In the mineral criteria flow definition the reference to the waters noted with an asterisk has been deleted. These asterisks denote, in part, stream segments that have been subjected to use attainability studies pursuant to 2.303 at great expense to municipal and industrial dischargers. These studies have demonstrated that alternative criterion and/or uses are applicable to certain waters and by removing the asterisks ADEQ is proposing to negate these

findings and subject the dischargers to significant cost for additional studies and/or the installation of additional treatment, which has already shown not to be necessary to protect the waters of the state.

Response: The portion of the definition referring to waters in Reg. 2.511 that is noted with an asterisk will be retained. After a brief review of the Site Specific Mineral Quality Criteria in Reg 2.511(A) it has become apparent that it is necessary to conduct an in-depth investigation of how and when the 4 cfs critical background flow rule was applied to the various UAAs from which these Site Specific Mineral Quality Criteria were derived. The Department has decided not to make any revisions to certain regulations concerning the 4 cfs critical background flow rule until the review can be completed and all interested parties can be included in the process.

Reg.2.106, Definitions (Critical Flows)

ADH

Comment: Streams and lakes currently being used as public drinking water sources need to be better protected and viewed similar to Extraordinary Resource and Ecologically Sensitive Waters. The mineral criteria for critical flows should be revised with the underlined words added so that it reads: *For minerals criteria – a permittee may use harmonic mean flow or 4 cfs, with the following exception: For waters listed as Extraordinary Resource Waters, Ecologically Sensitive Waters, water bodies in use as a public drinking water source, or waters impaired for minerals, use harmonic mean flow.*

Response: The Department acknowledges this comment; however, this type of revision to the water quality standards would require additional public notice and comment due to the potential interest of many parties. ADEQ respectfully requests that ADH assist in the development of this revised language prior to the next Triennial Review.

Reg.2.106, Definitions (Primary Season Critical Flow) (four similar comments)

GBMc & SWEPCO (submitted identical comments)

Comment: This definition is proposed to be deleted. We feel it should be retained to ensure that there is recognition of the 1 cfs background seasonal flow which is often used for developing aquatic life criteria based effluent limitations and critical dilutions for biomonitoring at small discharges into small watersheds with limited or no upstream flow.

AEF

Comment: ADEQ proposes to remove this definition from the regulation. AEF believes that this designation should be retained since it is essential for municipal and industrial dischargers to establish the clear applicability of Q7-10 during the primary season and/or a reasonable background seasonal flow of 1 cfs for watersheds less than 10² miles. Without this definition, small cities discharging to intermittent streams are left with no regulatory basis to establish background flows.

BWD

Comment: BWD supports the deletion of this definition, particularly as to the automatic one (1) cfs allowed for watersheds less than ten (10) square miles. (See BWD comments on “Critical flows”).

Response: The Primary Season Critical Flow is a component of process for implementing

minerals standards in NPDES permits. Significant concerns have been expressed over the removal of this definition; therefore, the primary season critical flow definition will remain in the regulation until the Department and Commission can further consider the concerns surrounding the removal of this definition.

Reg.2.106, Definitions (Harmonic Mean Flow)

BWD

Comment: BWD suggests that [harmonic mean flow] definition specify the minimum number of flow measurements and the minimum time period required.

Response: As with other implementation procedures regarding NPDES permits, the procedures for calculating harmonic mean flow are found in the State of Arkansas CPP. Arkansas is awaiting final approval from the EPA on the most current revisions to the CPP, including harmonic mean flow calculation procedures.

Reg.2.106, Definitions (Nonpoint source)

EPA

Comment: This definition is confusing given the stormwater example, since some stormwater is point source. EPA suggests this be reworded to "...stormwater runoff not regulated under CWA 402(p),"

Response: The definition for Nonpoint source will be revised to state, "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), agricultural or silvicultural runoff, irrigation return flows, and other sources of diffuse runoff." The inclusion of "stormwater runoff not regulated under Clean Water Act § 402(p)" is appropriate because the Department has authority over permitting programs for Construction, Industrial, and Municipal Separate Storm Sewer System (MS4) stormwater discharges.

Reg.2.106, Definitions (Naturally Occurring Excursions)

EPA

Comment: It is unclear what a "severe storm" is. It is also unclear what the impact of this definition would have on the permitting program, especially stormwater permits.

Response: The Department acknowledges this comment. However, this section of the regulation was not opened for public comment in the Department's proposed rulemaking. Pursuant to Regulation No. 8, the Commission's review of the proposed rulemaking during this Triennial Review is limited to the proposed changes submitted by the Department. See Reg.8.818 ("When amending portions of an existing regulation, the Commission's deliberations shall be restricted to those proposed amendments described in the public notice. Rulemaking proceedings concerning legally required periodic update of regulations shall be restricted to Department staff proposals."). The Department respectfully requests that EPA assist the Department in the development of this revised language prior to the next Triennial Review.

Reg.2.106, Definitions (Maximum Contaminant Level (MCL))

ADH

Comment: Substitute the word "goals" for the proposed word "guidelines" in order to make the wording compatible with the language of the federal Safe Drinking Water Act and the National

Primary Drinking Water Regulations.

Response: The Department agrees that compatibility with federal language is appropriate. Therefore, the definition for Maximum Contaminant Level will be revised to state, "The highest level of a contaminant that is allowed in drinking water. Maximum contaminant levels are set as close to maximum contaminant level goals as feasible using the best available treatment technology and taking cost into consideration."

Reg.2.106, Definitions (State of Arkansas Continuing Planning Process)

ADH

Comment: The purpose for this document's inclusion in Reg. No.2 is unclear and its description is incorrect. After some effort, a document by this name was found on ADEQ's website but it is over 10 years old, out of date, and, while it may give a description of ADEQ's Clean Water Act programs, it in no way "... describes the principal processes of the State's water quality management programs..." both because of its age and because of its exclusion of other existing state and federal programs which deal with water quality.

Response: The proposed change to this definition reflects the current title of the document referenced. The definition and references to the State of Arkansas CPP were in prior versions of Regulation 2 and the definition of the document itself has not changed. The Department is in the process of revising the State of Arkansas CPP and is waiting on final approval of the document from EPA. The draft 2010 CPP is more comprehensive, summarizing the Department's water quality management programs.

Reg.2.203, Outstanding Resource Waters

ADH

Comment: Streams and lakes currently being used as public drinking water sources need to be better protected and viewed similar to ERWs and ESWs. This section should be revised to include waters in use as a public drinking water source.

Response: Public drinking water sources are afforded protection by the designated use of domestic water supply. All waters of the state have a designated use of domestic water supply, unless Regulation No. 2 has been amended to specify the removal of the domestic water supply use for a specific water body or water body segment.

This proposed change would require additional public notice and comment due to the potential interest of many parties in this type of addition to the water quality standards. ADEQ respectfully requests that ADH assist in the development of this revised language prior to the next Triennial Review.

Reg.2.303, Use Attainability Analysis

EPA

Comment: Federal regulations at 40 CFR 131.10 describe requirements for the designation of appropriate uses. There is no federal requirement for the inclusion of like provisions in State rules. However, the State has elected to include a provision that essentially mimics the language in 40 CFR 131.10(g). EPA considers it inappropriate to limit the language in this provision to a description of requirements for removing or downgrading a designated use(s). EPA strongly recommends that the State include all aspects of 40 CFR 131.10 if it intends to repeat federal regulations in its own rules. This includes requirements outlined in 40 CFR 131.10(i), which requires States to evaluate the uses actually being attained when performing its triennial review

given that Coffee Creek, Mossy Lake and other waters in the State lack designated uses.

Response: The Department acknowledges the comment. As stated in the comment, there is no federal requirement to include the exact language of the federal regulations in the state water quality standards. Additionally 40 CFR 131.10(i) does not pertain to Reg.2.303, the conditions which must be met for designated use removal, it pertains to the process of standards revisions. The Department may look at this issue and consider making the revision in a future rulemaking. Issues related to Coffee Creek, Mossy Lake and other waters where designated uses have been removed through the State's rulemaking process are addressed in a response below; however, it should be noted that Coffee Creek and Mossy Lake have industrial water supply and agricultural supply designated uses. The Department is not aware of any water bodies completely lacking designated uses.

Reg.2.304, Physical Alteration of Habitat

River Valley Regional Water District (hereinafter "RVRWD")

Comment: It is River Valley Regional Water District's understanding that the changes proposed in this Triennial review are not intended to change or affect in any way the provisions of Reg. 2.310 for removing the [Extraordinary Resource Water (hereinafter "ERW")] designation, and they are not intended to revoke or undermine the original historical understanding involved in the initial ERW designations. If this understanding is correct, River Valley Regional Water District has no objection to the proposed changes. If, however, the changes to Reg. 2.304 currently proposed by ADEQ are intended to alter or have any effect on Reg. 2.310 or on the original historical understanding involved in the initial designation of ERWs, then River Valley Regional Water District opposes the change.

Response: Based on several comments received, the Department has decided to withdraw the proposed changes to Reg.2.304. As EPA did not approve the changes to Reg.2.304 that were adopted by the Commission in the 2007 Triennial Review, the previously approved language (April 23, 2004) will be returned to the regulation. Prior to the 2007 Triennial Review, the Department convened a workgroup to discuss issues related to ERWs, Ecologically Sensitive Water Bodies (hereinafter "ESWs"), and Natural and Scenic Waterways (hereinafter "NSWs"). The workgroup produced the 2007 changes to Reg.2.304 that were disapproved by EPA. The proposed changes to Reg.2.304 submitted by the Department during this Triennial Review were intended to find a balance between the intent of the workgroup and the concerns expressed by EPA in the Record of Decision on the 2007 changes. However, based on several comments received, the Department has decided to withdraw the proposed changes to Reg.2.304. As EPA did not approve the changes to Reg.2.304 that were adopted by the Commission in the 2007 Triennial Review, the previously approved language will be inserted in the regulation.

The proposed changes to Reg.2.304 were not intended to alter or have any effect on Reg.2.310. However, be reminded that EPA neither approved nor denied Reg.2.310 during the 2007 Triennial Review. EPA reserved approval or disapproval for individual water quality standards changes made under the procedure of Reg.2.310.

Without more explanation by the commenter, the Department cannot either agree or deny that changes to Reg.2.304 were "not intended to revoke or undermine the original historical understanding involved in the initial ERW designations." The Department cannot assume what the commenter means by "original historical understanding" without further explanation.

Reg.2.304, Physical Alteration of Habitat (three similar comments)

Ouachita Riverkeeper

Comment: ADEQ's proposed revision would change this protection so that "*significant physical alterations will . . . be allowed* where water quality, natural flow regime, and habitat of fish, shellfish, or other forms of aquatic biota will be maintained and protected." Proposed Reg. 2.304. But allowing significant changes to specially protected waters does not maintain and protect those waters. ADEQ should not implement the proposed revision to Reg 2.304. Instead, ADEQ should (1) maintain its prohibition on significant physical alterations to special water bodies, and (2) require that a proponent show that "water quality [and other factors] will be maintained and protected" (*i.e.*, the language ADEQ proposes for its revision) to demonstrate that a proposed physical alteration is not significant.

EPA

Comment: EPA recommends that the State revert to the previously approved narrative or provide new language that addresses the concerns outlined below.

As described in the January 2008 action, EPA stated that the general prohibition in 40 CFR 131.12(a)(3) is facially absolute, limiting authorization of an activity that diminishes ONRW water quality as it exists when the activity is authorized. However, EPA has long interpreted 40 CFR 131.12(a)(3) as allowing some limited activities resulting in temporary and short term changes in the water quality of an [Outstanding National Resource Water (hereinafter "ONRW")]. See Fed. Reg. 51400,51402 (November 8,1983).

As discussed in our previous action, EPA has also interpreted the term "degradation" as referencing detectable, rather than hypothetical, decreases in ONRW water quality. See *Arkansas v. Oklahoma*, 503 U.S. 91 (1992). A state's discretion for allowing ONRW water quality degradation is thus limited both as to magnitude (no detectable degradation) and duration (temporary and short term). When approved, the term "significant" in Regulation 2.304 was presumably subject to interpretation consistent with either or both of these limitations. And further, EPA is concerned that term "physical alteration of habitat" in itself implies permanent modification of the physical structure of an ONRW, which would likely result in permanent, not temporary and short term degradation.

Dr. Richard Grippo

Comment: Proposed change to Reg. 2.304 takes away the ability of the Director to determine whether a proposed physical alteration is significant or not. I am not arguing against this change but I am wondering why it was felt this change was necessary. It seems to be a rather significant change in the ability of the Director to respond to certain situations and I would like to hear what the justification is for this change.

Response: At the conclusion of the 2007 triennial review, EPA disapproved the revised (October 26, 2007) Regulation No. 2.304 and Appendix D in their Record of Decision dated January 24, 2008. EPA stated "As revised, Regulation 2.304(A) provides no more antidegradation protection to ONRW water quality than Regulation No 2.304(B) provides to other Arkansas waters. The revisions to Regulation 2.304 are inconsistent with federal requirements..." Based on several comments received, the Department has decided to withdraw the proposed changes to Reg.2.304. As EPA did not approve the changes to Reg.2.304 that were

adopted by the Commission in the 2007 Triennial Review, the previously approved language (April 23, 2004) will be returned to the regulation. Prior to the 2007 Triennial Review, the Department convened a workgroup to discuss issues related to ERWs, ESWs, and NSWs. The workgroup produced the 2007 changes to Reg.2.304 that were disapproved by EPA. The proposed changes to Reg.2.304 submitted by the Department during this Triennial Review were intended to find a balance between the intent of the workgroup and the concerns expressed by EPA in the Record of Decision on the 2007 changes. However, based on several comments received, the Department has decided to withdraw the proposed changes to Reg.2.304. As EPA did not approve the changes to Reg.2.304 that were adopted by the Commission in the 2007 Triennial Review, the previously approved language will be inserted in the regulation.

Reg.2.305, Short Term Activity Authorization

ADH

Comment: Notification needs to be provided to other state agencies for any short term authorization by the ADEQ Director which will result in a violation of Arkansas Water Quality Standards. The programs of other agencies can be dependent of water quality, and those programs could be adversely impacted if water quality is degraded. The ADEQ Director has a responsibility to notify those other agencies if such a degradation is authorized.

Response: ADEQ acknowledges the comment. This procedural type of action is probably not best suited for inclusion in the State's Water Quality Standards, but ADEQ will consider the comment when reviewing our procedures regarding STAAs. Please note that the Department publishes public notices for Clean Water Act § 401 certifications in cases where the project(s) are located on a waterbody that is designated as an ERW, ESW, or NSW. Additionally, STAAs can be viewed by county on the ADEQ website at the following web address http://www.adeq.state.ar.us/water/branch_permits/individual_permits/temp_permits/temp_permit_s.asp.

EPA

Comment: The last sentence in the opening paragraph appears to authorize dredge and fill projects. Although the provision states that it is not intended to supersede the federal permitting process, it is unclear what authority the State has to authorize such activities, given that a federal §404 permit is required?

Response: Please note that this section of the regulation was not opened for public comment in the Department's proposed rulemaking. Pursuant to Regulation No. 8, the Commission's review of the proposed rulemaking during this Triennial Review is limited to the proposed changes submitted by the Department. See Reg.8.818 ("When amending portions of an existing regulation, the Commission's deliberations shall be restricted to those proposed amendments described in the public notice. Rulemaking proceedings concerning legally required periodic update of regulations shall be restricted to Department staff proposals."). However, it is also important to note that the intent of this provision is only to authorize such activities that are in accordance with the authority of the Department, not to supersede the authority of any other federal or state law.

EPA

Comment: While it is an important aspect of this provision, it is unclear how the prohibition on activities that may affect threatened and or endangered species and critical habitat will be

implemented. The current wording makes the provision somewhat open ended. The State should consider extending this sentence to "...unless, after consultation with the USFWS, the adverse effect has been authorized by an incidental take statement or ESA section 10 permit."

Response: Please note that this section of the regulation was not opened for public comment in the Department's proposed rulemaking. Pursuant to Regulation No. 8, the Commission's review of the proposed rulemaking during this Triennial Review is limited to the proposed changes submitted by the Department. See Reg.8.818 ("When amending portions of an existing regulation, the Commission's deliberations shall be restricted to those proposed amendments described in the public notice. Rulemaking proceedings concerning legally required periodic update of regulations shall be restricted to Department staff proposals."). The Department respectfully requests that the EPA assist in the development of this revised language prior to the next Triennial Review.

Reg.2.309, Temporary Variance

EPA

Comment: Second sentence states "The variance will be for specified constituents and shall be no longer than a three year period." EPA Region 6 has concerns with variances which may have open ended compliance dates in NPDES permits. It is recommended that ADEQ consider revisions to this section which will require at the end of the period of variance, that the permit include an enforceable final effluent limit with a specific date for its achievement, even if it extends beyond the expiration date of the permit.

Response: The Department acknowledges this comment but cannot consider this addition as it was not part of the proposed rulemaking submitted by the Department. Implementation procedures for Temporary Variances can be found in the CPP and follow current EPA guidance. Please note that this section of the regulation was not opened for public comment in the Department's proposed rulemaking. Pursuant to Regulation No. 8, the Commission's review of the proposed rulemaking during this Triennial Review is limited to the proposed changes submitted by the Department. See Reg.8.818 ("When amending portions of an existing regulation, the Commission's deliberations shall be restricted to those proposed amendments described in the public notice. Rulemaking proceedings concerning legally required periodic update of regulations shall be restricted to Department staff proposals."). Additionally, requirements regarding NPDES permits are more appropriately addressed through APCEC Regulation No. 6, Regulations for State Administration of the National Pollutant Discharge Elimination System (NPDES).

Reg.2.310, Procedure for the Removal of the Designated Use of Extraordinary Resource Water, or Ecologically Sensitive Waterbody, or Natural and Scenic Waterway for the Purpose of Constructing a Reservoir on a Free Flowing Waterbody to Provide a Domestic Water Supply.

ADH

Comment: The Arkansas Department of Health is responsible for the approval of a public water supply source. The criteria required to initiate a petition to remove an ERW, ESW, or NSW designation should include written approval or concurrence from the Arkansas Department of Health. Suggested wording to be added to the criteria:

A letter of concurrence of approval of the water supply as a public drinking water source from the Arkansas Department of Health.

Response: ADEQ acknowledges this request and would be interested in including such an addition; however, this change would require additional public notice and comment due to the potential interest of many parties in this type of addition to the water quality standards. Reg.2.310 was adopted based upon the recommendations of a workgroup with diverse interests. ADEQ respectfully requests that ADH assist in the development of this revised language prior to the next triennial review.

Reg.2.404, Mixing Zones

EDCC & GBMc & Siloam Springs (submitted identical comments)

Comment: The proposed regulation eliminated the use of a mixing zone for pH. We know of no technical basis for such a change and recommend that the current wording of this section be retained.

Response: The Department intended for this proposed change to be removed in Exhibit A to the Second Amended Petition but it was inadvertently overlooked. The language present in the October 26, 2007 version of Regulation No. 2 will be retained.

Reg.2.405, Biological Integrity

AEF

Comment: The 2nd paragraph of this section is proposed to be changed (from previous drafts) to remove the reference to "variety and abundance" and replace it with the terms "habitat and hydrological condition". Further the proposed revisions remove the requirement that the reference stream should have similar habitat and hydrological conditions. AEF is concerned that a small municipality, for example, discharging to an intermittent stream is likely creating a "habitat and hydrological condition" that is unlike any reference stream in the same ecoregion and, therefore, is unlikely to support a comparable aquatic biota community. The potential ramifications in economic impact terms are enormous, including studies and more stringent effluent limitations, while the environmental benefits are marginal if positive at all. Therefore AEF recommends that the sentence "The reference stream should have similar habitat and hydrologic conditions." be retained.

Response: The Department agrees with the recommendation by AEF that a reference stream being used in a study to determine water quality and biological impacts in a stream as a result of any type of influent should be compared to a reference stream that is "similar in habitat and hydrologic condition." The requirement is contained in the first sentence of the second paragraph of Reg. 2.405.

The intent of this revision is to clarify that the comparisons should be made according to stream conditions, not aquatic biota communities. An investigation should include: 1) the stream being assessed; and 2) a reference stream in the same ecoregion with similar habitat and hydrologic conditions. If the assessed stream has experienced perturbation, then the aquatic biota will not be similar. This is the intent of the regulation.

Comparing streams that are similar in the "variety and abundance" of aquatic species may result in comparing one impacted stream with another. Clearly this is not the intent of Reg. 2.405; however, as written, this type of comparison could be conducted.

The Department does not agree with the statement made by AEF that “The potential ramifications in economic impact terms are enormous, including studies and more stringent effluent limitations, while the environmental benefits are marginal if positive at all.” AEF does not present any data to justify this statement.

Reg.2.405, Biological Integrity

GBMc & Siloam Springs & EDCC (submitted identical comments)

Comment: We believe the addition of “hydrologic condition” in the first sentence of the second paragraph could nullify both upstream and downstream point source comparisons within small watersheds. Therefore, we request this sentence remain unchanged. In addition, we believe the second sentence of that paragraph, and its use of “hydrologic condition” should remain unchanged.

Response: The Department agrees that the proposed language could nullify both upstream and downstream point source comparisons within small watersheds that have little or no upstream flow. However, such a comparison is inappropriate for water bodies with little or no upstream flow.

Reg.2.405, Biological Integrity

AEF

Comment: ADEQ proposes to remove the words "collect and" from the last sentence. The purported reason for this is that, with the current language, ADEQ is prohibited from using the UAA studies in 303d determinations and for other purposes because it did not "collect" the data. AEF, first, believes that the stated reason is dubious, and, secondly, is concerned that the proposed change violates earlier ADEQ assurances that the inclusion of the Biological Integrity Criterion would not impose on permittees' requirements to conduct expensive and time consuming assessments. Although the sentence goes on to say that the "data will not be used to develop or impose permit limits" it does not reinforce the earlier ADEQ commitment that the studies themselves won't be required in permits, only that the "data will not be used to develop or impose permit conditions". AEF believes that ADEQ should honor its original intent and retain the words "collect and" in this section.

Response: 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...” If this language is not removed, Regulation No. 2.405 will remain in violation of 40CFR 130.7(5). It would continue to prohibit the use of outside data and force the Department into nullifying any and all previous determinations that have occurred using data collected by outside entities. This would include all third party rulemakings that have occurred since the adoption of this language in 2004. In addition, leaving this language in the regulation would require the Department to perform all biological assessments as they relate to changes in standards, thus drastically changing the third party rulemaking process. This would result in enormous delays in the rulemaking process because the small staff and limited resources of the Department are not equipped to handle the potential additional workload. As a result, revisions of standards would not keep pace with permitting, permits would be issued with more stringent limits, and point source dischargers would be required to implement additional treatment options to meet the more stringent permit limits.

Reg.2.405, Biological Integrity

EPA

Comment: The last sentence of the second paragraph indicates the evaluation of data from an aquatic biota assessment will not be used to develop or impose permit limits. It is unclear why the State would not give consideration to such information when developing permit limits? Please clarify.

Response: Currently, biological collections are conducted as a support mechanism for water body assessments (303(d) listings), designated use and standards attainment, TMDL development, UAA studies, and third party rulemakings.

BWD

Comment: BWD generally supports the proposed changes as helpful clarifications, subject to the following: (1) Not just some, but all of the changes proposed in the March 2010 version on page 4-2 should be utilized. The terms "aquatic life" and "aquatic life use" should replace "fisheries" and "fishery," respectively...; (2) BWD agrees that it should not be the sole responsibility or purview of ADEQ to "collect" data for an aquatic biota assessment. There are a number of entities qualified to collect the data for an aquatic biota assessment and BWD would not want Reg.2.405 to be read as excluding such a possibility; and (3) It makes good sense scientifically to be able to utilize available aquatic biota assessments when developing NPDES permit limits, which is why BWD prefers the language in the last sentence of the March 2010 version of Reg.2.405 and objects to the statement in the last sentence of the proposed Reg.2.405 that "such data will not be used to develop or impose permit limits."

Response: The Department acknowledges these comments. As to (1) and (3), these changes would require additional public notice and comment due to the potential interest of many parties in this type of addition to the water quality standards. ADEQ respectfully requests that BWD assist in the development of such amendments prior to the next Triennial Review.

In addition, historically, NPDES permits were issued with little consideration of biological data due to the lack of such data. Currently, biological collections are conducted as a support mechanism for water body assessments (303(d) listings), designated use and standards attainment, TMDL development, Use Attainability Analysis studies, and third party rulemakings.

Reg.2.503, Turbidity

ADEQ

Comment: A sample size of not less than 24 monthly samples is noted in the draft Reg 2.503. This sample size is only appropriate for the ambient monitoring network. A revision was proposed in the draft Reg 2.503 that would allow ADEQ to consider data collected from both the ambient and roving monitoring networks.

ADEQ recommends that the paragraph be revised as follows:

There shall be no distinctly visible increase in turbidity of receiving waters attributable to municipal, industrial, agricultural, other waste discharges or instream activities. Specifically, in no case shall any such waste discharge or instream activity cause turbidity values to exceed the base flows values listed below. Additionally, the non-point source runoff shall not result in the exceedance of the in stream all flows values in more than 20% of the Arkansas Department of Environmental Quality monitoring network samples taken in not less than 12 samples.

Response: In addition, based on comments received, the definition for Nonpoint source will be

revised to state, "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), agricultural or silvicultural runoff, irrigation return flows, and other sources of diffuse runoff." The inclusion of "stormwater runoff not regulated under CWA 402(p) Clean Water Act § 402(p)" is appropriate because the Department has authority over permitting programs for Construction, Industrial, and Municipal Separate Storm Sewer System (MS4) stormwater discharges.

Reg.2.504, pH

ADH

Comment: We oppose the proposed changes in the section. While probably not intentional, the proposed language would allow a variation in the pH of the stream or lake of as much as 5 pH units (between 5.0 and 10.0) within a 24 hour period. Such a variation is excessive and unreasonable for any public water system which must treat water from a stream or lake. The existing language of the regulation with allows no more that a 1.0 pH unit variation within a 24 period needs to be preserved.

Response: The Department agrees that the current proposed language is unclear. Reg. 2.504 will be revised to state, "The pH standards of between 6.0 and 9.0 are applicable. 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. pH standards are applicable to all waters of the state, except in those water bodies where natural background conditions result in pH values to either be less than or greater than the criteria listed."

Reg.2.504, pH

EPA

Comment: The final sentence in this provision indicates that pH values are applicable to all waters, with the exception of "those waterbodies where natural background conditions result in pH values to either be less than or greater than the criteria listed." States may establish site-specific criteria equal to natural background, where natural background is defined as background due only to non-anthropogenic sources. At a minimum, State standards should include:

- (1) A definition of natural background consistent with the above;
- (2) A provision that site specific criteria may be set equal to natural background; and
- (3) A procedure for determining natural background, or alternatively, a reference in the water quality standards to another document describing the binding procedure that will be used.

Without these components, Arkansas cannot exempt waters from compliance with numeric criteria for pH or other contaminants.

Response: In Reg.2.106, "Natural background" is defined as "Ambient conditions or concentrations of a parameter due to non-anthropogenic sources; natural background does not typically interfere with support of designated uses nor the level of aquatic life expected to occur naturally at the site." Although the Department disagrees that procedures and provisions belong in the State water quality standards regulation, Reg.2.308 addresses procedures for setting criteria. Reg. 2.303 addresses the determination that natural background conditions are not impacting attainment of assigned designated uses.

Reg.2.505, Dissolved Oxygen

Ouachita Riverkeeper

Comment: ADEQ's Dissolved Oxygen (DO) criteria at Reg. 2.505 do not protect Aquatic Life uses for all waters. EPA has explained DO criteria must be protective of all aquatic life forms in

all life stages - including growth, reproduction, juvenile stages, and in intergravel sites – and shown that a DO of 4 mg/L is not protective, and in fact can cause impairments. See 1986 “Ambient Water Quality Criteria for Dissolved Oxygen” page 31 (EPA 440/5-86-003). Reg. 2.505 sets DO levels as low as 2 or 3 mg/L. ADEQ does not give or reference any scientific or site specific justification (or referenced) in the rules for such low criteria. ADEQ’s current DO levels are inadequate to support healthy fish and aquatic life, especially for early life stages. Therefore, ADEQ should adopt criteria for DO that do not allow levels to drop below 4 mg/L.

Response: The 1986 EPA study did not take into account site-specific or ecoregional water body characteristics. The dissolved oxygen standards in Regulation No. 2 are based on: (1) the 1987 study, *Physical, Chemical, and Biological Characteristics of Least-Disturbed Reference Streams in Arkansas’ Ecoregions*; (2) on the findings of UAA studies; and (3) on other approved EPA studies. Each of these studies document sustainable aquatic life communities in waterbodies with dissolved oxygen concentrations less than 4 mg/L. In addition, the primary season DO standards were established to protect early life stages of aquatic organisms.

Reg.2.505, Dissolved Oxygen

EDCC & GBMc & Siloam Springs

Comment: We recommend that the current language be retained and that all references to “fish community as described in Reg. 2.302” be deleted from this section. The fish communities in Reg. 2.302 include key and indicator species developed from research on least-disturbed waterbodies which specifically excluded point source dischargers. It is not reasonable to expect waterbodies which receive point source discharges to maintain those communities.

Response: The term “fishery” will be retained. A fishery is clearly defined in Reg. 2.303(F) as “Fisheries - This beneficial use provides for the protection and propagation of fish, shellfish, and other forms of aquatic life.” The research mentioned in this comment is the 1987 study titled, *Physical, Chemical, and Biological Characteristics of Least-Disturbed Reference Streams in Arkansas’ Ecoregions*. This study was conducted on least-disturbed water bodies (not undisturbed) and included waterbodies which receive point source discharges; i.e. Kings River, Flint Creek, Moro Bayou, Bayou De View, etc. Furthermore, it is the purpose of Regulation No. 2 “... to designate the uses for which the various waters of the State shall be maintained and protected; to prescribe the water quality standards required to sustain the designated uses; and to prescribe regulations necessary for implementing, achieving and maintaining the prescribed water quality.” This applies to all waterbodies including those receiving point source discharges. It is reasonable to expect waterbodies which receive point source discharges to “support diverse communities of indigenous or adapted species and other forms of aquatic biota” and be “generally characterized” by the key and indicator species listed. The key and indicator species listed in Reg.2.302(F)(3)(a-f) were present in least-disturbed waterbodies, some of which receive point source discharges, according to the 1987 study.

Reg.2.505, Dissolved Oxygen

AEF

Comment: The first sentence of the first full paragraph in this section states that “In streams with watershed of less than 10 mi², it is assumed that insufficient water exists to support a fish community as described in Reg. 2.302 during the critical season.” In the first sentence of the second paragraph it states that “All streams with watersheds of less than 10 mi² are expected to support a fish community as described in Reg. 2.302 during the primary season when stream flows, including discharges, equal or exceed 1 cubic foot per second (cfs). So, in essence, a

watershed of less than 10 mi² is not expected to support a fishery in the critical season but is expected to support a fishery during the primary season....and not just any fishery, but a fishery "as described in Reg. 2.302", or essentially, the same fishery as a reference stream.

Ichthyologists, limnologists, and other scientists who work for member companies of AEF are unable to understand how one can expect not to find fisheries in critical periods but expect to find a diverse and representative fisheries in the primary season...in the same small waterbody. AEF suggest that the first sentence in the second paragraph be changed to read; "Streams with watersheds of less than 10 mi² are generally expected to support a fishery during the primary season when....." We believe this removes the illusion that "All" streams of less than 10 mi² are expected to support an ecoregion reference stream fishery at any time.

In the third paragraph the proposed draft states that in those watershed of less than 10 mi² where there is a discharge of 1 cfs or more that there is sufficient water to support a "perennial fish community as described in Reg. 2.302..." AEF is unable to find a "perennial fish community" listed in Reg. 2.203 and, therefore, suggest that the reference to a "perennial fish community" be changed to "fishery".

Response: The term "fishery" will be retained. According to Reg.2.505 a watershed of less than 10 mi² without significant groundwater flows or enduring pools is not expected to support a fishery during the critical season. During the primary season, all watersheds of less than 10 mi² are expected to support a fishery generally characterized by the species found in least-disturbed water bodies.

It is appropriate to expect not to find a fisheries during the critical season but to expect to find a diverse community during the primary season. It is well documented that fish species utilize the habitat in small tributaries for spawning and routinely migrate into these tributaries during the primary season. Reg.2.505 states that "all streams with watersheds of less than 10mi² are expected to support a fishery during the primary season...." This is contrary to the above statement that "'All' streams of less than 10 mi² are expected to support a...fisher/ at any time."

The Department acknowledges the suggestion that the reference to a "perennial fish community" be changed to "fishery" and will investigate the historical intent of the perennial fish community language. However, at this time, this change would require additional public notice and comment due to the potential interest of many parties in this type of addition to the water quality standards. ADEQ respectfully requests that AEF assist in the development of such amendments prior to the next Triennial Review.

Reg.2.507, Bacteria

ADH

Comment: One of the purposes of Reg. No. 2 under the Clean Water Act is to protect designated uses, including maintaining state waters as swimmable. The *E. coli* and Fecal Coliform standards in Reg. 2.507 fail to achieve this purpose since they exceed the bacteria limit for a swimmable stream or lake as defined by the Arkansas Department of Health in its *Rules and Regulations Pertaining to Outdoor Bathing Places*. That criteria is an arithmetic average for *E. coli* of 126/100 ml on two consecutive days.

Response: ADEQ is charged with the protection of the Primary Contact Recreation Designated

Use of waterbodies, as described in Regulation No. 2. ADH is charged with the protection of daily use of outdoor bathing places (swimming areas). Although a two day exceedance of an ADH standard may result in a temporary loss of the use of a bathing area, it does not result in the nonattainment of the designated use. The standards set forth in this regulation are protective of the designated use and meet the requirements of the Clean Water Act. While the APCEC standards may differ from the bacteria limits found in the ADH regulations, the Department follows the methodology established in EPA's 1986 document *Ambient Water Quality Criteria for Bacteria*.

Reg.2.507, Bacteria

EPA

Comment: Paragraph C: The method of assessing data collected to determine impairment has been dropped from the regulation. How will the state determine whether a stream is impaired for bacteria based on data collected?

Section 2.507 includes both E coli and Fecal Coliform numbers, are criteria for both parameters applied in permits?

Response: Based on recommendations from EPA, the Department has removed assessment procedures from the text of Regulation No. 2, when possible. The procedure for determining stream impairment due to bacteria is found in the Assessment Methodology, which is reviewed every two years in conjunction with the Integrated Water Quality Monitoring and Assessment Report (305(b) Report). Procedures for applying water quality criteria to permit limits are found in the State of Arkansas CPP. Currently, *E. coli* is used for assessing water quality for inclusion on the 303(d) impaired waterbodies list.

Reg.2.507, Bacteria (two similar comments)

Friends of the North Fork and White Rivers (hereinafter "Friends")

Comment: Support in part and object in part to proposed Reg. 2.507 regarding Bacteria. Support the proposed changes to Reg. 2.507 that have made this provision more readable. Object, however, to the changes that have been deleted: (1) the primary contact season *Escherichia coli* (*E.Coli*) geometric mean numeric criteria of 126 colonies/100mL for all waters other than Lakes, Reservoirs, Extraordinary Resource Waters (ERW), Ecologically Sensitive Waterbodies (ESW), and Natural and Scenic Waterways (NSW); (2) the secondary contact season *E.Coli* geometric mean numeric criteria of 630 colonies/100mL for all waters other than Lakes, Reservoirs, ERW, ESW, and NSW; and (3) the term "reservoir" from the list of waterbodies subject to the more stringent criteria for *E.Coli*.

BWD

Comment: Although the current Reg. 2.507(A) and (B) is somewhat confusing, the only reasonable interpretation of the regulation is that the *E.Coli* criteria calculated as geometric means **apply to all waterbodies** (according to the applicable primary versus secondary contact designations), not just to lakes, reservoirs, ERW, ESW, and NSW. In addition to the clear reading of the current Reg. 2.507(A) and (B), it makes no sense that there would only be individual sample criteria and no geometric mean criteria for *E.Coli* in waters other than Lakes, Reservoirs, ERW, ESW, and NSW.

The deletion of the current Reg. 2.507(A) and (B) geometric mean numeric criteria for *E.Coli*

that apply to waters other than Lakes, Reservoirs, ERW, ESW, and NSW is contrary to and prohibited by the antidegradation provisions of Section 303(d)(4)(B) of the Clean Water Act, 33 U.S.C. § 1313(d)(4)(B), 40 C.F.R. § 131.12, and Reg. 2.201 - 2.202. The current Reg.2.507(A) and (B) geometric mean numeric criteria for *E.Coli* that apply to waters other than Lakes, Reservoirs, ERW, ESW, and NSW can only be deleted from Reg. 2 if they are replaced with equivalent or more stringent criteria.

Response: The Department respectfully disagrees with the interpretation of the regulation by the commenters. The bacteria standards remain unchanged from the October 26, 2007 version of Reg.2.507. Geometric mean for primary and secondary contact standards for *E. coli* did not apply to "All Other Waters," but only to ERW, ESW, NSW, Reservoirs, and Lakes.

The Department inadvertently removed the reference to reservoirs under the section for primary contact and secondary contact. This section will be revised to state "ERW, ESW, NSW, Reservoirs, Lakes."

Reg.2.507, Bacteria

BWD

Comment: Proposed Reg. 2.507 provides: "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." Reg. 2.507 also provides: "Geometric Mean – Calculated on a minimum of five samples spaced evenly and within a thirty-day period." These provisions are unclear and seemingly contradictory. How does the requirement for a minimum of eight samples relate to the requirement that the geometric means be calculated on a minimum of five samples? If only five samples within a thirty-day period are required for calculating the geometric mean, does this mean that any additional samples can be ignored? These two provisions should be clarified in a way that does not allow for manipulation of the data.

Response: The assessment criteria for evaluating the geometric mean of bacteria data is adopted from the EPA guidance document, "Ambient Water Quality for Bacteria, 1986." The assessment of bacteria data to determine the season long designated use attainment is established in the Department's Assessment Methodology that is developed in conjunction for Integrated Water Quality Monitoring and Assessment Report and submitted every two years to EPA.

Regarding the number of samples needed to calculate the geometric mean, all data that meet the requirements will be utilized during the assessment process. A minimum of 8 data points will be collected during the primary contact season (May to September). The geometric mean is calculated with at least five data points that are collected evenly spaced over a 30 day period within the primary contact season.

Reg.2.507, Bacteria

ADEQ

Comment: A typo was noted in Part (A), this section should read "Primary Contact Season – May 1 to September 30" instead of **and**.

Response: No response is necessary.

Reg.2.508, Toxic Substances

Dr. Richard Grippo

Comment: Under Reg. 2.508 Toxic substances, lines 5 and 6 after the deleted section state “Within the Zone of Dilution acute toxicity standards may be exceeded but acute toxicity may not occur”. How is acute toxicity determined? The concept is defined at the beginning of Reg. 2 on page 2-2 but this does not explain how toxicity is determined in the above case. There should either be an explanation of the method of determining acute toxicity included with the statement or the reader should be referred to another section of Reg. 2 where the procedure for determining acute toxicity is described.

Response: A reference to the procedure for determining acute toxicity is located in the next to last paragraph on page 5-8 and Attachment IX of the State of Arkansas CPP.

Reg.2.508, Toxic Substances (two similar comments)

Ouachita Riverkeeper

Comment: ADEQ’s Proposed Criteria for Toxic Substances are as much as 10 times EPA’s recommended Human Health Criteria. The proposed “Human Health Criteria” for “Toxic Substances” at Reg. 2.508 are inconsistent with and far less stringent than EPA’s National Recommended Water Quality Criteria. See <http://www.epa.gov/waterscience/criteria/wqctable/>. ADEQ proposes values that are ten times higher than the EPA recommended values. For example, the EPA human health recommended criterion for Toxaphene is 0.00028 ug/L (which would be 0.28 ng/L), while the Arkansas proposal is 2.8 ng/L (or 0.0028 ug/L). The same appears true for the other criteria, which each allowing ten times more toxic substances than recommended by EPA before Arkansas considers a body of water polluted. This difference is directly attributable to Arkansas choosing to a less stringent, higher risk public health regulation: EPA values are based on a cancer risk factor of one in a million (10⁻⁶), while the Arkansas’ “[c]riteria [are] based on a lifetime risk factor of 10⁻⁵,” i.e. ten times more cancer risk at one in 100,000 (10⁻⁵). See Reg. 2.508. Allowing this risk over the national recommended value is not in the public interest and should be changed to be consistent with EPA values. At a minimum, the Ouachita Riverkeeper requests that ADEQ explain why the state has chosen to allow a higher cancer risk from pollution.

Ozark Society

Comment: While the proposed changes to the allowable concentrations of toxic substances section 2.508 are strengthened in some cases, they are also weakened in other cases. The Ozark Society opposes the weakening of water quality standards in this and any other section of Regulation 2.

Response: The Department acknowledges these comments. However, all proposed amendments to water quality criteria for toxic substances were removed in Exhibit A to the Second Amended Petition, thus this section of the regulation was not opened for public comment in the Department’s proposed rulemaking. Pursuant to Regulation No. 8, the Commission’s review of the proposed rulemaking during this Triennial Review is limited to the proposed changes submitted by the Department. See Reg.8.818 (“When amending portions of an existing regulation, the Commission’s deliberations shall be restricted to those proposed amendments described in the public notice. Rulemaking proceedings concerning legally required periodic update of regulations shall be restricted to Department staff proposals.”). The Department respectfully requests Ouachita Riverkeeper and the Ozark Society present any information they

may be able to provide regarding water quality criteria for toxic substances prior to the next Triennial Review.

Reg.2.508, Toxic Substances

ADEQ

Comment: The revised first sentence in the draft Reg 2.508 erroneously contains the phrase “aquatic life biota”. ADEQ recommends that the sentence be revised as follows:

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 life.

Response: No response is necessary.

Reg.2.508, Toxic Substances (Selenium)

GBMc & AEF (two identical comments)

Comment: As stated in the fact sheet developed by EPA for the new draft Selenium criteria, and as presented in the draft Selenium criteria document <http://www.epa.gov/seleniumcriteria.htm>, Selenium is a bioaccumulative pollutant. Aquatic life is exposed to selenium primarily through their diets. Risks stem from aquatic life eating food that is contaminated with selenium rather than from direct exposure to selenium in the water.

For aquatic life, the toxic effects with the lowest thresholds (and those that form the basis of the water quality criteria) are effects on the growth and survival of juvenile fish and effects on larval offspring of the adult fish that were exposed to selenium during the over wintering period.

Therefore it is reasonable to utilize the stream conditions expected to occur during this over wintering period as the critical flow for selenium, not the 7Q-10 flow. We recommend that Reg. 2.106 be amended to delineate the critical flow for selenium as the average flow during the primary season and that critical flow be additionally noted in Reg. 2.508.

Response: The comment suggests that a higher flow volume be used for developing effluent limitations for selenium. By applying this higher flow, the limitation would be a higher concentration of selenium than if a Q7-10 flow was applied. This higher concentration would occur during a period in which research has shown that fish are more sensitive to selenium and its effects (mid-September to mid-May). Designating wintertime flows as critical for selenium concentrations would allow permittees to discharge higher concentrations of selenium into water bodies during the critical season. This would result in increased selenium assimilation by developing juvenile fish. Although selenium is stored in higher concentrations in detoxifying organs, it also accumulates in ovaries and is passed on to progeny. Increasing selenium concentrations during low flows would result in greater selenium uptake by adults, and thus higher selenium concentrations in newly hatched fish. Increased selenium concentrations cause greater risk of mortality due to edema, lordosis, and other physical deformations. The revision requested by the commenter would not protect Fisheries designated uses as found in Reg.2.302(F) and Appendix A, would be contrary to Regs.2.301, 2.405, and 2.508, and is not in accordance with the toxic implementation strategy found in the State of Arkansas Continuing Planning Process.

Reg.2.508, Toxic Substances (Mercury)

AEF & GBMc (submitted identical comments)

Comment: At AEF's earlier suggestion, ADEQ re-inserted the asterisks referencing the bioaccumulation of mercury rather than the acute and chronic toxicity. However, mercury remains in the table entitled "Dissolved Metals" under "Aquatic Life Criteria". Since mercury is of primary concern as a bioaccumulation factor for human health, AEF believes that the mercury criterion of 0.012 ug/L should be moved from the "Aquatic Life Criteria-Dissolved Metals" table to the appropriate Human Health Criteria table.

We request that the Dissolved Metals table in Reg. 2.508 be amended by removing the "chronic" mercury criterion of 0.012 ug/L from that table and placing it under the appropriate Human Health Criteria table on the next page. As noted by the asterisk in the current Reg. 2.508, the mercury criterion is "based on bioaccumulation of residues in aquatic organisms, rather than toxicity".

Response: The criteria designations in Reg.2.508 are appropriate according to the *Quality Criteria for Water 1986 (Gold Book)*. The *Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organism and Their Uses* indicate that, except possibly where locally important species are very sensitive, freshwater aquatic organisms and their uses should not be affected unacceptably if the four-day average concentration of mercury does not exceed 0.012 ug/L more than once every three years and if the one hour average concentration does not exceed 2.4 ug/L more than once than every three years. If the four-day average concentration exceeds 0.012 ug/L more than once in a three-year period, the edible portion of consumed species should be analyzed to determine whether the concentration of methylmercury exceeds the Food and Drug Administration action level. ADH is the lead agency on human health criteria due to the consumption of mercury in fish tissue.

Reg.2.509, Nutrients (six similar comments)

Ouachita Riverkeeper

Comment: ADEQ's proposed revisions, however, remove numeric limits for Phosphorus impaired waters. ADEQ does not include any replacement or additional nutrient standards or any explanation for why ADEQ proposes to weaken nutrient limitation, except to include a site-specific standard for a single lake, Beaver Lake.

Accordingly, the Ouachita Riverkeeper submits that

1. ADEQ must not remove the Phosphorus limitations that are currently in Reg.2.509.
2. Should ADEQ decide to proceed with the proposed changes to Reg.2.509, the Ouachita Riverkeeper requests that ADEQ provide an explanation for its decision.

Allan Gates

Comment: The proposed revisions include a change that would delete language in Reg 2.509 that calls for specific numeric discharge limits on phosphorus in certain waterbodies. The question of phosphorus limits in Northwest Arkansas are currently implicated in a number of ongoing administrative actions. In addition, an Intergovernmental Working Group representing the five principal cities in Northwest Arkansas is currently organizing a joint effort to address strategy and planning for water quality concerns. I believe it would be imprudent to alter the provisions regarding phosphorus limits, which were approved by EPA in the 2007 Triennial

Review, until there is more clarity on the likely outcome in the other ongoing administrative actions and the Department has a chance to obtain the views of the Intergovernmental Working Group. I am concerned that some parties may misinterpret the proposed changes if they are made final, or argue that the deletion of the language approved in 2007 regarding phosphorus limits should somehow authorize or require other changes in the regulation of phosphorus discharges even though such changes are not intended by ADEQ, the Commission, or any other party in Arkansas. I also believe it would be desirable for ADEQ to have the benefit of the Intergovernmental Working Group's thoughts before making the proposed changes.

ADH

Comment: The proposed change deletes the total phosphorus limit for higher flow discharges and for those discharges to impaired streams. No language is proposed for that deleted. ADEQ needs to explain why the existing language is being deleted; what the agency's long range plan is for controlling nutrients; and how the remaining vague, qualitative nutrient standard in Reg. No. 2 will control nutrients in Arkansas streams and lakes.

Friends

Comment: Object to the removal in proposed Reg. 2.509 of the phosphorus requirements for point source discharges into specified waterbodies, which include certain waterbodies in the legislatively designated nutrient surplus watersheds and on Arkansas's list of impaired waterbodies (the so-called 303(d) list). The Reg. 2.509 numeric phosphorus requirements have been an important tool in reducing nutrient loadings to these waterbodies. The deletion of the Reg. 2.509 phosphorus requirements is contrary to and prohibited by the antidegradation provisions of Section 303(d)(4)(B) of the Clean Water Act, 33 U.S.C. § 1313(d)(4)(B), 40 C.F.R. § 131.12, and Reg. 2.201 through 2.203. The Reg. 2.509 phosphorus requirements, therefore, can only be deleted from Reg. 2 if they are first replaced with equivalent or more stringent instream, numeric phosphorus criteria or, possibly, if equivalent or more stringent effluent limitations on phosphorus are first included in APCEC Regulation No. 6.

League of Women Voters (hereinafter "LWV")

Comment: [T]he LWVAR and the LWVWC oppose the removal of the phosphorus limits on point source discharges into the watershed of waters listed as impaired by phosphorus pursuant to section 303(d) of the Clean Water Act or into waters in the nutrient surplus watersheds as designated by the Arkansas Legislature, which include the Beaver Lake and Illinois River watersheds in Northwest Arkansas. The phosphorus standards for point source discharges in Reg. 2.509 are, once again, fully in alignment with the position of the LWVAR and the LWVWC. The Reg. 2.509 phosphorus standards for point source discharges are the bases for the phosphorus limits in a number of NPDES permits that have significantly reduced the phosphorus loads to impacted water bodies in Northwest Arkansas. These standards are not included in any other regulations of the APCEC. If these standards are removed from Reg. 2, then the legal basis for existing and future NPDES permits may be called into question.

BWD

Comment: BWD objects to the removal of the numeric phosphorus requirements for point source discharges into certain waterbodies in the legislatively designated nutrient surplus watersheds and on Arkansas's list of impaired waterbodies (the so-called 303(d) list). The

Beaver Lake watershed was declared to be a Nutrient Surplus Area by Act 1061 of 2003 (codified at Ark. Code Ann. § 15-20-1104). The Reg.2.509 numeric phosphorus requirements have been an important tool in reducing nutrient loadings to Beaver Lake. Discharges of nutrient-containing wastewater into Beaver Lake watershed have the potential to adversely impact the Lake's water quality and can have a direct bearing on what it costs BWD to provide our customers with drinking water that meets or exceeds all federal and state regulatory requirements.

The deletion of the Reg.2.509 phosphorus requirements also is contrary to and prohibited by the antidegradation provisions of the Clean Water Act. ADEQ has conducted none of the analyses that would be required by Reg.2.201 through Reg.2.203 and 40 C.F.R. § 131.12 in order to consider removal of the Reg.2.509 phosphorus requirements. ADEQ's position appears to be that the phosphorus requirements in Reg.2.509 are not "water quality standards" and, therefore, they should be removed. The Reg.2.509 phosphorus requirements, however, have been in the Arkansas water quality standards for many years. They were adopted into the water quality standards following a complete public participation process and EPA review and approval. By definition, therefore, they are water quality standards....

BWD believes that even if ADEQ had attempted the requisite analyses, such waterbody-by-waterbody analyses would not support removal of the Reg.2.509 phosphorus requirements (this would unquestionably be the case for the affected Outstanding Resource Waters). The Reg.2.509 phosphorus requirements, therefore, can only be deleted from Reg. 2 if they are first replaced with equivalent or more stringent instream, numeric phosphorus criteria or, possibly, if equivalent or more stringent effluent limitations on phosphorus are first included in APCEC Regulation No. 6.

Response: In an enclosure to a letter received on July 31, 2009, EPA recommended "that this section be removed from the numeric portion of the standards and placed into an implementation document such as the CPP." However, based on varied responses received, the Department has decided not to remove the numeric discharge limits from Reg.2.509 until all interested parties are able to fully express their concerns.

In addition, it must be understood that the two paragraphs and table concerning point source discharges are not water quality standards. This portion of Reg.2.509 is guidance for development of permit limits. As with other implementation procedures regarding NPDES permits, the procedures for determining phosphorus limits are found in the State of Arkansas CPP. Arkansas is awaiting final approval from the EPA on the most current revisions to the CPP, including procedures for determining phosphorus permit limits.

Reg.2.509, Nutrients (Beaver Lake)

Ouachita Riverkeeper:

Comment: ADEQ does not explain why it only provides nutrient standards for Beaver Lake or why it limits that standard to the growing season. It also omits a daily maximum for Secchi Transparency.

Response: An interdisciplinary workgroup was convened to develop a process by which site-specific standards for nutrients could be developed for lakes. Because of its importance to Arkansans, Beaver Lake was selected as the prototype for developing this process. It was the recommendation of the workgroup that a growing season geometric mean for

Chlorophyll-a and the annual average for Secchi Transparency were the most protective criteria for the protection of the domestic water supply designated use. As resources become available, site-specific criteria can be developed for other Arkansas lakes.

Reg.2.509, Nutrients (Beaver Lake)

Northwest Arkansas Council, Friends, LVW (submitted very similar comments)

Comment: Support the adoption of the water quality criteria for Chlorophyll a and Secchi Transparency. It is our understanding that these criteria were developed by a scientific process that was carried out over a period of several years. Having scientifically-based numeric, as opposed to narrative, standards for indicators of nutrient pollution will provide a straightforward method of assessing whether the water quality standards are being met and will help to ensure the long-term use of Beaver Lake as a drinking water source. Friends would suggest that this criteria apply to all our lakes.

Response: The Department acknowledges these comments. These criteria were developed as site-specific criteria for Beaver Lake and may not be appropriate for other state lakes in other ecoregions. As resources become available, site-specific criteria can be developed for other Arkansas lakes.

Reg.2.509, Nutrients (Beaver Lake)

Larry Kelly – Arkansas Realtors Association

Comment: As a realtor, state wide and locally, we're interested in water quality at Beaver Lake and other water sources throughout the state. And also, now that it may affect development and building and property rights around the state so reasonable water regulations are quite acceptable, and we applaud and support those ourselves. The Benton County master planning committee is dealing with some of these issues right now as in riparian rights and water quality as we're trying to look at some kind of master plan for growth in Benton County. All within reason and all balance so I've heard nothing or seen nothing this evening to cause me alarm or concern.

Response: The Department acknowledges this comment.

Reg.2.509, Nutrients (Beaver Lake)

BWD

Comment: BWD supports the addition of site-specific numeric water quality criteria for Chlorophyll a and Secchi Transparency for Beaver Lake.... The proposed numeric criteria for Chlorophyll a and Secchi Transparency were selected to limit nutrients and algae to levels that do not impair the Lake's designated drinking water use. These criteria were recommended by a broadly-based scientific workgroup following several years of meetings, research, discussion, and information sharing.... Having scientifically-based numeric, as opposed to narrative, criteria for indicators of nutrient pollution will provide a straightforward method of assessing whether the water quality standards are being met. BWD believes that numeric criteria related to nutrients are essential to ensure the long-term protection of Beaver Lake as a drinking water source....

In the absence of any numeric nutrient criteria, nutrient enrichment and algal growth in the Lake may be allowed to increase to levels that will require significant water treatment costs. Already, BWD experiences episodic taste and odor events typically caused by 2-Metholisoborneal (MIB)

and occasionally by Geosmin. MIB and Geosmin are related to the concentration of algae and cyanobacteria in the raw water.... Should the taste and odor events increase in frequency and intensity in the future, additional treatment may become necessary.... In addition, increases in algal growth due to nutrient enrichment will impact Lake turbidity (summer turbidity in Beaver Lake is mostly algal as evidenced by the ratio of total suspended solids to total volatile suspended solids)....

Algal blooms also can cause operational problems for our treatment processes, such as the clogging of our filters. In addition and also related to the nutrient levels in the lake, BWD is seeing an increase in disinfection byproducts precursors in the water at our intake. When chlorinated, these precursors form disinfection byproducts (DBPs). DBPs are strictly regulated under the Safe Drinking Water Act, with the DBP limits becoming even more stringent in 2012. The cost for BWD and its customer cities to maintain compliance with the 2012 DBP standards is expected to be significant. For all of the reasons set forth above, it is critical to the long-term protection of Beaver Lake as a drinking water source that the proposed Reg.2.509 site-specific, numeric water quality criteria for Chlorophyll a and Secchi Transparency for Beaver Lake be adopted.

Response: The Department acknowledges this comment.

Reg.2.509, Nutrients

EPA

Comment: EPA recommends that Arkansas develop and adopt numeric criteria for nutrients in addition to the narrative standards currently in place.

Response: As resources become available, site-specific criteria can be developed for other Arkansas waterbodies, pursuant to Arkansas's Nutrient Criteria Development Plan, as mutually agreed upon with EPA.

Reg.2.509, Nutrients

Ouachita Riverkeeper

Comment: ADEQ's proposed revisions to Arkansas' water quality standards are unlawful because they do not institute numeric nutrient limits and, instead, remove numeric standards for the nutrient Phosphorus.... EPA guidance calls for states to adopt numeric criteria for nutrients, including for nitrogen, phosphorous, chlorophyll-a, and transparency.... This Triennial Review period is Arkansas' opportunity to set its own numeric criteria rather than have EPA set such criteria for the state. Should ADEQ decide not to establish numeric criteria for nutrients for all waters, the Ouachita Riverkeeper requests that ADEQ provide an explanation for its decision.

Response: Guidance documents published by EPA do not have the force of law and, therefore, are not binding. A memo from Mr. Geoffrey Grubbs, Director of EPA's Office of Science and Technology (Nov. 14, 2001) titled, *Development and Adoption of Nutrient Criteria into Water Quality Standards*, indicates that states may elect to establish translators in lieu of numeric criteria for nutrients. The Department and the Beaver Lake Scientific Workgroup's approach utilized this guidance and established such criteria. The Department is in the process of developing such criteria for other state waterbodies following the process outlined in the *State of Arkansas Nutrient Criteria Development Plan, 2008*, which has been mutually agreed upon with EPA.

Reg.2.509, Nutrients (Assessment of Impairment for Nutrients)

EPA

Comment: The first sentence of the last paragraph refers to the use of "Department assessment methodology" for determining when nutrients result in stream impairments. Since the current water quality standard is narrative in context, is there a written procedure in place for performing this type of assessment? If so, please provide EPA with a copy for review. If not, a written implementation procedure should be developed.

Response: The Department is currently developing and evaluating an assessment methodology for determining impairments due to nutrients. This procedure is more appropriate to be included in the Assessment Methodology submitted in conjunction with the Integrated Water Quality Monitoring and Assessment Report (305(b) Report).

Reg.2.509, Nutrients

ADEQ

Comment: A typo was noted in the second sentence of Reg 2.509 (A). The sentence should read "Impairment of a waterbody from excess nutrients is dependent on the natural waterbody characteristics ..."

Response: No response is necessary.

Reg.2.510, Oil and Grease (five similar comments)

Ouachita Riverkeeper & BWD (submitted identical comments)

Comment: The proposed change at Reg 2.510 for oil and grease omits the words "no more than" after the words "average of" and before the words "10 mg/L." The sentence should read: "Oil and grease shall be an average of no more than 10 mg/L or a maximum of 15 mg/L."

SWEPCO

Comment: Replacement language in this section states, "Oil and grease shall be an average of 10 mg/L or a maximum of 15 mg/L when discharging to surface waters." This language indicates oil and grease must be discharged to surface waters, which clearly is not the Department's intent. We suggest changing the original language to, "As a guideline, oil and grease concentrations shall not exceed an average of 10 mg/L, or exceed a maximum of 15 mg/L."

AEF

Comment: In its current form the regulation mandates that "Oil and grease shall be an average of 10 mg/L of a maximum of 15 mg/L when discharging to surface waters." AEF does not believe that is the ADEQ intent. In addition, as with changes in the critical flow definition, this seems to go against EPA preferences to remove implementation language from the regulation. Regulation No. 2 establishes in-stream WQS, not discharge requirements. AEF suggest that the words "when discharging to surface waters" be stricken.

EPA

Comment: The second to last sentence reads to support that discharges will have 10 mg/L oil and grease or a maximum of 15 mg/L when discharging. This wording does not clearly reflect the goal of minimizing the presence of oil and grease from Arkansas waterbodies. The State may choose to reference its implementation language to clarify the previously approved statement.

Response: The Department acknowledges that this revision was unclear. This sentence will be

revised to state, "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." The intent of this revision was to establish this regulation as a standard instead of as a guideline. Furthermore, based upon a recommendation from EPA, the language of "shall not exceed" was removed to be consistent with language in the State's assessment methodology.

Reg 2.511(A), Mineral Quality (four similar comments)

Ouachita Riverkeeper

Comment: Regulation 2.511 on Mineral Quality omits the footnote for the asterisks (*) that it includes throughout the criteria.

GBMc & EDCC & Siloam Springs (submitted identical comments)

Comment: We also recommend that the waterbodies which went through 3rd party rulemakings for dissolved minerals using the 4 cfs background flow continue to be marked with an asterisk. In this way the 3rd party rulemakings are better documented.

Response: In Exhibit A to the Second Amended Petition that was submitted for public comment, the asterisks throughout Reg.2.511 were intended to be deleted; however, the word processing software used makes it look as though the asterisks were underlined (which is the mark-up notation for an addition to the regulation). The Department acknowledges the confusion this may have caused to the public reviewing the draft document.

Based on the comments received, the footnote and the corresponding asterisks will be retained in Reg.2.511(A). It is important to note that not all site specific mineral criteria adopted as part of a UAA are denoted with an asterisk.

Reg.2.511(A), Mineral Quality (four similar comments)

GBMc & EDCC

Comment: We recommend that the current Reg. 2 language be retained which states that the dissolved minerals values listed are monthly average concentrations. This is important when the eco-region criteria are used for unnamed waterbodies and because those facilities which developed site specific dissolved minerals criteria did so on the basis of those values being used as such in the NPDES permitting process. Unless similar language is retained in the regulations it will become subjective as to whether the criteria are monthly averages or daily maximum values. It would cause facilities compliance problems.

AEF

Comment: ADEQ proposes to remove the reference to monthly average concentrations in Subsection (A) because it complicates the calculations used in 303d determinations; purportedly because a month with only one data point may be the determining factor in a 303d list determination. AEF believes that if, in fact, that is the case, that it's the 303d list evaluation criteria that need changing not the Arkansas WQS.

Numerous permittees have expended hundreds of thousands of dollars demonstrating that many of these criteria are not appropriate, don't affect the use, or should be changed to be more representative. These studies were based on the existing language which uses monthly averages and removal of the language bring uncertainty regarding future mineral criteria requirements.

Municipalities and industries need stability to reinforce prior capital expenditures and plan for future growth and development. AEF request that the reference to the use of monthly averages should be retained.

Siloam Springs

Comment: We believe mineral values should remain as monthly average concentrations. Current municipal and industrial NPDES permits specifically address monthly averages and therefore, the removal of this verbiage would allow ambiguous interpretation of the Regulation. Significant compliance issues would arise if these concentrations were subsequently interpreted and regulates as daily maximums.

Response: The criteria listed in Reg.2.511(A) represent site-specific criteria, most of which were adopted following the development of a UAA study. UAAs, and the resulting third-party rulemakings, do not develop permit limits, but water quality criteria for a specific portion of a waterbody. The procedures for developing permit limits as either monthly averages or daily maximum values are found in the State of Arkansas CPP.

While some UAAs may have been based on monthly averages, the term “monthly average concentrations” only was added to the regulation in 2007 in response to comments on the 2007 Triennial Review, Docket No. 07-003-R. Most of the site-specific criteria added to Reg.2.511 were developed prior to the adoption of that language in 2007. Therefore, retaining the language “monthly average” in the regulation would not be consistent with the studies supporting the criteria. Furthermore, water quality standards are not listed as monthly averages.

Reg 2.511(B), Mineral Quality

EDCC & Siloam Spring & GBMc (submitted identical comments)

Comment: We recommend the continuance of the current table entitled “Calculated Ecoregion Reference Stream Values”. The proposed revised table contains values which represent the improper calculation of allowable concentrations based on the current methodology.

Response: The Department cannot determine from the submitted comments where the improper calculation occurs within the proposed revised table. The Department has reviewed the table and has determined that the calculations are correct.

Reg 2.511(B), Mineral Quality

AEF

Comment: In prior versions of subsection (B), the ecoregion values were specifically listed. In this version, ADEQ is proposing to remove the "1/3 higher or more than 15 mg/L language", add 1/3 to the ecoregion values and establish "Calculated" values. AEF sees no justification for the proposed changes and, by removing the 15 mg/L flexibility, imposes more stringent standards on those dischargers (primarily small municipalities) that can least afford it....with no concomitant environmental enhancement.

Response: The Department respectfully disagrees. The current values in the table incorporate “the 1/3 higher or more than 15 mg/L, whichever is greater,” calculation as appropriate. There is not a 15 mg/L “flexibility,” or a subsequent 15 mg/L added to the calculated value, as referred to by the commenter. For example, prior to calculation, the Ouachita Mountains ecoregion reference stream chloride value is 6 mg/L. The 1/3 higher calculation is 8 mg/L. Because this value is less than 15 mg/L, 15 mg/L becomes the calculated ecoregion reference stream value.

The Department proposed this revision because of this kind of confusion when calculating these values for permit limit development and compliance.

Reg 2.511(B), Mineral Quality

BWD

Comment: In general, BWD strongly supports the changes to Reg.2.511(B) as they have made this provision much clearer. BWD agrees with deleting the language about calculations in the current Reg.2.511(B) because, as BWD understands it, the table already incorporated those calculations. BWD is not clear, however, whether the values in the table are water quality criteria, as we believe they should be, or whether they are just values representing “significant modification of the water quality” (whatever that means). For Reg.2.511(B) to be perfectly clear, BWD believes that the language should be changed to specify that the values in the table in Reg.2.511(B) are the water quality criteria applicable to streams in the various ecoregions that are not otherwise listed in Reg.2.511(A).

Response: The Department acknowledges the comment. These values are the instream concentrations applicable to streams in the various ecoregions that are not otherwise listed in Reg.2.511(A) for the determination of permit limits and for the initiation of the use attainability analysis process for mineral standards revisions.

Appendix A

Tim Klinger

Comment: In almost every case, there are inconsistencies between the Plates and the lists included as *Designated Use Variations Supported by UAA or other Investigations* and *Specific Standards Variations Supported by UAA*. As an example, the Ozark Highlands Ecoregion includes 4 plates labeled OH-1, OH-2, OH-3, and OH-4. On Plate OH-1 are included OH-1 #1, OH-1 #2, and OH-1 #5. All but OH-1 #5 are included in the list labeled *Designated Use Variations Supported by UAA or other Investigations*. And all but OH-1 #2 are included in the list labeled *Specific Standards Variations Supported by UAA*. Similar inconsistencies are found throughout.

Response: When a UAA is preformed there can be four outcomes:

- 1) No Site-Specific Standard(s) & No Designated Use Removal(s)
- 2) Site-Specific Standard(s) & Designated Use Removal(s)
- 3) No Site-Specific Standard(s) & Designated Use Removal(s)
- 4) Site-Specific Standard(s) & No Designated Use Removal(s)

In the example of OH-1 #5, SWEPCO Reservoir has a site-specific temperature standard, but none of the designated uses were removed. In the example of OH-1 #2, Columbia Hollow Creek has no site-specific standards, but does have a seasonal fishery use. Thus, there will not always be a corresponding footnote between the two maps.

Appendix A

ADH

Comment: The current identification mechanism of stream segments and protected areas in Appendix A is by a hard copy of the respective plate of the ecoregion. ADEQ should develop and make this information available in GIS format. Such a format would allow other agencies to more easily determine the impact of these designations on their programs. It would also more

easily provide ADEQ locational information, if required, on the proximity of other agencies' program efforts on streams and lakes.

Response: In cooperation with the Arkansas Geographic Information Office, the Department has made several layers of GIS data available on GeoStor. This includes GIS layers for the Ecologically Sensitive Water Bodies, Trout Waters, Extraordinary Resource Waters, Natural and Scenic Waterways, and the Department's base water layer. These GIS layers were developed based on the National Hydrography Dataset Medium Resolution data. The Department is developing a GIS layer of waterbodies with Variations by Use Attainability Analyses (UAA) and plans to make this layer available on GeoStor in 2012.

<http://www.geostor.arkansas.gov/G6/Home.html>

Appendix A

Central Arkansas Water (hereinafter "CAW")

Comment: Central Arkansas Water (CAW) respectfully requests that the ecoregion designation for the Lake Maumelle Watershed, including the Lake and those tributaries that lay to the west and north of the Lake (including but not limited to Bringle Creek, Yount Creek and Reece Creek) be changed from the Arkansas River Valley Ecoregion (as shown in Plate ARV-2 of Appendix A of Reg 2) to the Ouachita Mountains Ecoregion.

Response: The Department acknowledges this comment but cannot consider this revision because ecoregion boundary revisions were not part of the proposed rulemaking. This change would require additional public notice and comment due to the potential interest of many parties in this type of revision to the water quality standards. The Department respectfully requests that CAW provide further information pertaining to the change in ecoregion designation for the Lake Maumelle Watershed for possible inclusion in the next Triennial Review.

Appendix A

ADEQ

Comment: The Drafts of Regulation No. 2 submitted to the PC&E Commission in March 2010 and April 2010 contained several proposed revisions to the regulation clarifying the intent of the terms "Fishery" and "Aquatic Life". Subsequently all of these revisions were to be removed from the Draft of Regulation No. 2 submitted to the PC&E Commission in May 2010. The March 2010 and April 2010 proposed revisions inadvertently remained in Appendix A of Regulation No. 2. There are approximately 28 instances in which the term "Fishery" is struck thru and the term "Aquatic Life" remains in Appendix A.

Response: No response is necessary.

Appendix A

AEF

Comment: ADEQ re-instated the fisheries use(s) in the proposed draft. However, the term "aquatic life use" remains in Appendix A and is undefined in Section 2.106. AEF requests that the term fishery be substituted for aquatic life use throughout the Appendix A to make it consist with the rest of the regulation.

Response: Revisions will be made to reflect that the term "Fishery" remains in Appendix A. See ADEQ comment above.

GENERAL COMMENTS NOT RELATED TO A SPECIFIC REGULATION

Coffee Creek/Mossy Lake

Ouachita River Keeper

Comment: ADEQ's Triennial Review process must redesignate Coffee Creek and Mossy Lake, tributaries of the Ouachita River, as Aquatic Life uses water bodies.... Regulation 2, Appendix A...exempts Coffee Creek and Mossy Lake from the perennial fisheries/Aquatic Life designation based on a 1984 Use Attainability Analysis that is 1) outdated and superseded, and 2) not in the administrative record in a complete form.

It is unlawful to exempt Coffee Creek and Mossy Lake from the fisheries/Aquatic Life designation because EPA has shown that Aquatic Life is an existing use for these water bodies. ADEQ must maintain and protect existing instream uses.... In 2007, EPA performed a Use Attainability Analysis "to determine if the current 'no aquatic life use designation' for Coffee Creek and Mossy Lake is appropriate."... EPA concluded that the current designation is not appropriate, explaining that "[f]rom the biological data collected it is apparent there is a diverse and abundant, though seasonal, aquatic community in the Reference Site stream." EPA noted, among other things, that "[t]he waters of Coffee Creek and Mossy Lake have the potential to support aquatic life indicative of streams in the ecoregion....

In addition, the exemption of Coffee Creek and Mossy Lake from the Aquatic Life use is unlawful because Arkansas' 1984 Use Attainability Analysis cannot justify removing an existing use. Arkansas' regulations only allow a use attainability analysis to justify "removing a fishable/swimmable [i.e. Aquatic Life/Primary Contact] designated, which is not an existing use, from a water body. Here, the fishable/swimmable use is an existing use. The Arkansas's regulations describes the "Aquatic Life" use for "streams" as "water which is suitable for the protection and propagation of fish or other forms of aquatic life adapted to flowing water systems."... The 2007 EPA UAA found key species and indicator species from the lists for the Gulf Coastal Region at Ark. Reg. 2.302(F)(3) at the Reference site on Coffee Creek.... Because Coffee Creek and Mossy Lake are "suitable for the protection and propagation of fish or other forms of aquatic life adapted to flowing water systems," they have existing Aquatic Life uses under Arkansas' regulations. Therefore, Arkansas' regulation 2.303 does not allow ADEQ to rely on a use attainability analysis to justify removal of that use and the current exemption is unlawful.

Moreover, ADEQ does not have in its records a complete copy of the 1984 UAA upon which it relied to remove Coffee Creek's and Mossy Lake's uses in the first place, a fact the agency acknowledged by email dated March 27, 2009.... For example, the 1984 Analysis is missing Sections II C, III, and IV, which include the biological factors of Coffee Creek, findings, and summary and conclusions, respectively. As a result, the administrative record lacks a valid UAA to support continuing the exemption from the fishable/swimmable and water supply uses that would otherwise apply to Coffee Creek and Mossy Lake.

Response: Regulation No. 2, Appendix A does not "exempt Coffee Creek and Mossy Lake from the perennial fisheries/Aquatic Life." Regulation No. 2, Appendix A states that there is "no fishable/swimmable or domestic water supply uses" for Coffee Creek and Mossy Lake.

The fishable/swimmable use for Coffee Creek is not an existing use. According to the Clean Water Act an existing use is: 1) the use a waterbody is capable of supporting at present; and 2) the use a waterbody has actually attained since November 28, 1975. There is no documentation that either of these criteria have been met. Although the Department has no scientifically defensible documentation of the lack of fishable/swimmable use since 1984, the water quality present is insufficient to support a fishable/swimmable use.

The September 1973 Arkansas Water Quality Standards, Regulation No. 2, Appendix A, page X, lists Coffee Creek as having the limiting condition of PM. Condition PM states, "Such streams receive large volumes of treated paper mill wastes in proportion to their flow and are unsuitable for Class B uses...." Class B Use is defined as "[s]uitable for desirable species of fish, wildlife and other aquatic and semi-aquatic life, raw water source for public water supplies, secondary contact recreation and other uses." The 1984 UAA was not relied upon "...to remove Coffee Creek's and Mossy Lake's uses in the first place." It was conducted to verify the absence of a fishable/swimmable use, as had been noted as early as 1973. EPA approved this study and the continuation of the use variations for these waterbodies.

Due to concerns of the Department and Georgia-Pacific with the veracity of the 2007 EPA UAA, the decision was made not to make a water quality standard revision based upon that report at this time. As noted in Georgia-Pacific's comment below, the Department and the facility have been in consultation with EPA, and Georgia-Pacific has committed to performing a full Use Attainability Analysis. The Department will make any necessary changes to the water quality standards following the completion of that study depending upon the outcome of the study.

Coffee Creek/Mossy Lake

Georgia Pacific

Comment: Georgia-Pacific supports the APC&EC's proposed Regulation 2 and is providing these comments specifically regarding the continued inclusion of the existing use variation for Coffee Creek and Mossy Lake...which directly affects Georgia-Pacific's Crossett operations. This use variation was originally based on a 1984 Use Attainability Analysis completed by Georgia-Pacific and has been maintained based on reevaluation in subsequent Triennial Reviews by the APC&EC and approval of those Triennial Reviews by the US EPA.

Comments filed on the currently proposed Regulation 2 by the Tulane Environmental Law Clinic on behalf of the Ouachita Riverkeeper reference a 2007 "Use Attainability Analysis" on Coffee Creek, Mossy Lake and the Ouachita River (the "2007 Report") prepared by U.S. EPA Region 6. In those comments, the Ouachita Riverkeeper asserts the Coffee Creek and Mossy Lake should be redesignated as Aquatic Life uses water bodies based on the 2007 Report. Georgia-Pacific disagrees. As Georgia-Pacific has previously stated in submitted comments to U.S. EPA Region 6, there are a number of substantive and procedural flaws in the 2007 Report, and the facts in the 2007 Report do not support the conclusions. It does not provide a sound basis for the removal of the existing use variation. The 2007 Report does not address the 40 CFR 131.10 factors on which the original use variation was based and did not follow the State of Arkansas' specific requirements and procedures applicable to Use Attainability Analyses. Additionally, despite requests to participate in and comment on the 2007 Report, neither Georgia-Pacific nor the ADEQ were given the opportunity to comment on the draft 2007 Report or given notice before it

was finalized. Despite this omission, Georgia-Pacific submitted comments to U.S. EPA Region 6 on July 21, 2008 and resubmitted those comments on February 3, 2009. [Those comments were attached to the comment letter.]

In an effort to resolve concerns with the 2007 Report, Georgia-Pacific, in conjunction with ADEQ, met with U.S. EPA Region 6 and has committed to working with the ADEQ to conduct an Use Attainability Analysis on Coffee Creek and Mossy Lake. Appropriate portions of the previous U.S. EPA work will be incorporated as allowed by the ADEQ Continuing Planning Process. This UAA will follow applicable state procedures, which include a public participation process, and is expected to be completed by the end of 2011. ADEQ will evaluate the existing use variations and initiate any necessary changes to Regulation 2 following receipt and review of the final UAA.

Response: The Department acknowledges the comments. Upon receipt of scientifically defensible data, the Department will evaluate the data and consider revising designated uses as appropriate.

Application of Fishable/Swimmable Designated Uses

Ouachita River Keeper

Comment: ADEQ unlawfully applies categorical designated uses to small watershed streams that are less protective uses than the Clean Water Act requires. Federal regulations include a rebuttable presumption that primary contact and aquatic life, i.e., “fishable/swimmable,” designated uses apply to all water bodies.... Arkansas’ regulations, however, reverse the burden so that the ADEQ assumes without evidence that small watershed water cannot attain the “101(a)(2) uses” and requires a showing that those more protective uses can be attained. This approach is unlawful both because it fails to incorporate the more protective assumption of attainability and because it overlooks all existing uses....

[Regs.2.302 and 2.507] assume without evidence that the criteria for primary contact recreation are not attainable in all small watershed streams, unlawfully reversing the rebuttable presumption that 40 C.F.R. 131.12(a)(1) requires in favor of the more stringent use.... Because categorically removing “fishable/swimmable” designated uses on the assumptions that those uses are not attainable and are not existing uses violated the Clean Water Act, ADEQ’s Triennial Review Process must revise Regulation 2 so that the default designations for all waters are Primary Contact uses and Perennial Aquatic Life uses.

Response: The Clean Water Act requires states to: 1) designate uses; 2) establish water quality criteria; and 3) develop and implement antidegradation policies. To this end, it is not “unlawful” to designate uses as the State deems appropriate. A State may designate uses for a waterbody by examining the suitability of a waterbody for certain designated uses based on the physical, chemical, and biological characteristics of the waterbody.

Based on physical characteristics, watersheds of less than 10 mi² are not appropriate for primary contact recreation because conditions (water depths) allowing full body contact are generally not present. At best, watersheds of less than 10 mi² are suitable only for secondary contact for part of the year.

Application of Fishable/Swimmable Designated Uses

EPA

Comment: Arkansas has multiple waters listed in Appendix A as not supporting “fishable swimmable” uses (i.e. Coffee Creek and Mossy Lake). EPA continues to strongly support that Arkansas utilize the triennial review process to add appropriate uses to these waterbodies.

Response: The Department acknowledges the comments. Upon receipt of scientifically defensible data, the Department will evaluate the data and consider revising designating uses as appropriate.

Anti-degradation implementation procedures

EPA

Comment: EPA notes that Regulation No. 2 does not include information on Arkansas’ Anti-degradation implementation procedures. Please incorporate written procedures establishing how the state will implement its Anti-degradation policy via NPDES permits.

Response: As with other implementation procedures, anti-degradation implementation procedures are found in the State of Arkansas CPP. Arkansas is awaiting final approval from EPA on the most current revision to the CPP, including anti-degradation implementation procedures.

Multijurisdictional waters

EPA

Comment: Has or does ADEQ plan on addressing differing criteria across “multijurisdictional waters”? This is relevant especially when the upstream state has an impairment in addition to a less stringent standard than the downstream state, and thereby potentially causing and contributing to downstream impairment (as is potentially the case with waterbodies in Arkansas, the upstream state, that flow into either Louisiana and Oklahoma, the downstream states).

Response: The Department acknowledges the comment. “[D]iffering criteria across ‘multijurisdictional waters’” are most appropriately addressed through the permitting process, not as part of the water quality standards for the State of Arkansas. As stated previously in this Responsive Summary, implementation procedures are found in the State of Arkansas CPP. Arkansas understands its responsibility under the law to protect the water quality of all downstream states.

Request for stakeholder workgroups

BWD & Friends

Comment: Suggests that in the future ADEQ conduct stakeholder workshops prior to filing proposed changes to Reg. 2 with the APCEC. As stated in EPA’s Water Quality Standards Handbook,…”An important component of the water quality standards setting and review process is a meaningful involvement of those affected by the standards decisions.... Enlisting the support of municipalities, industries, environmentalists, universities, other agencies, and the affected public in collecting and evaluating information for the decision making process should assist the State in improving the scientific basis for, and in building support for, standards decisions. The more that people and groups are involved early in the process of setting appropriate standards, the more support the State will have in implementing the standard.”

ADEQ had several informal meetings with the Arkansas Environmental Federation regarding the

current proposed revisions to Reg. 2. BWD would very much like to see these type of meetings expanded to a broader range of stakeholders, with an opportunity for the exchange of drafts of the proposed changes to Reg. 2 prior to anything being filed with the APCEC. ADEQ is to be commended for its efforts to include an informal presentation and question and answer session at the public hearings held in July 2010 regarding the proposed changes to Reg. 2, but the public hearing setting does not really allow for collaborative efforts. BWD recognizes the time and effort that would be involved in undertaking stakeholder workshops, but we believe that the importance of Reg. 2 to restoring and maintaining the chemical, physical, and biological integrity of Arkansas's waters is worth it.

Response: The Department acknowledges these comments and will give strong consideration to holding stakeholder meetings prior to future Triennial Reviews. For those issues throughout the Responsive Summary where the Department requested further information from the commenter for possible inclusion in future rulemakings, the Department requests that those issues and concerns be submitted at anytime, not only during stakeholder meetings.

Public Notice

Dr. R. Grippo

Comment: The required Notice of the Public Hearing in Jonesboro appeared to be insufficiently advertised, based on the low public turnout (one person). My understanding is that the Jonesboro public hearing (and hearings in other cities) was advertised only on the ADEQ website and in the Arkansas Democratic Gazette some time in May or June. Putting the notice on the website is fine but advertisement in only one newspaper, several weeks before the hearing, is insufficient to make the public aware of the upcoming hearing. The meeting in Jonesboro should be advertised in the local newspaper (Jonesboro Sun), one week before the public hearing and again on the day of the hearing. This should probably also be done for the cities of Fayetteville, Arkadelphia and North Little Rock, where the other public meetings were held, to encourage as much public input as possible.

Response: The Department acknowledges the comment. All notices of proposed rulemakings are done in accordance with Ark. Code Ann. § 8-4-202(d) and APCEC Reg.8.801-802.

Addition of Ecologically Sensitive Water Body Designated Use

Arkansas Natural Heritage Commission

Comment: The ANHC recently provided data to staff of the Arkansas Department of Environmental Quality (ADEQ) for use in a review of stream segments proposed by the U.S. Fish and Wildlife Service for designation as "Ecologically Sensitive Waterbodies" under Regulation 2. Using our information and input from the U.S. Fish and Wildlife Service, and the Arkansas Game and Fish Commission, ADEQ staff began working through the Regulation 2 procedures for adding the "Ecologically Sensitive Waterbody" designation to new stream segments (Reg.2.311). We were discouraged that these streams segments were not included in this triennial review. We believe there is sufficient information available to justify the designation of most of the recommended streams. We encourage the ADEQ to move forward with the designation recommendation for those stream reaches meeting the criteria outlined in the Regulation.

Response: The Department agrees that sufficient information is available to justify the designation of ESW on several stream segments proposed by the USFWS and supported by ANHC. An ESW designated use "identifies segments known to provide habitat within the

existing range of threatened, endangered, or endemic species of aquatic or semi-aquatic life forms.” Prior to the initiation of the 2010 Triennial Review, the Department was unable to complete all of the documentation necessary for these revisions. The Department acknowledges the receipt of data from ANHC pertaining to stream segments proposed for ESW designation, and requests that ANHC and USFWS continue to assist with this effort.

Economic Impact/Environmental Benefit

AEF

Comment: ADEQ has failed to comply with provisions of Regulation 8 related to the EI/EB analysis.... ADEQ’s analysis falls short of the intent of Act 1264 of 1993 and the provision of Regulation 8. The Department contends inaccurately in its EI/EB analysis that cost analysis would have to be developed for each individual point source – 57 by ADEQ’s count. This is simply not the case. The EI/EB analysis does not require such calculations, as noted below.

ADEQ’s contention that in merely completing the analysis form it has complied with Regulation 8 is also disappointing and erroneous. The analysis form itself requires the petitioner to, “Answer all questions, unless an exemption applies, using information reasonably available.” It is clear that ADEQ’s finding of “unduly cumbersome” does not fit the listed exemptions, nor is it in keeping with the Department’s commitment to stakeholders who spent several months working in good faith with ADEQ and the PCE Commission to craft the EI/EB analysis language included in Regulation 8. We contend that ADEQ cannot carve out a new exemption, then claim presumptive adequacy by simply completing the analysis form which claims its own new exemption. ADEQ cannot assume the PCE Commission’s regulatory authority by creating its own exemption under the cover of a presumptively adequate analysis form.

Furthermore, ADEQ’s section on environmental benefits states “...standards of certain toxic substances are proposed to be amended to comply with revised national criteria.” Said amendments were dropped in the second draft of the Triennial Review changes. Yet, the reference environmental benefit continued through the next two iterations of the draft regulation that were provided to stakeholders. No such toxic substances amendments exists in the current draft available for public review. This so called presumptively adequate analysis provides no clarity for the general public, only confusion and mistrust.

While the AEF understands the Department’s limitations related to performing an EI/EB analysis and has worked with the Department at the Commission’s request to clarify the language and better understand the scope and therefore the related costs of the proposal, it is not within the purview, nor the legal requirements of the public to provide an EI/EB analysis. The responsibility to provide a presumptively adequate analysis within the framework of law and regulation prior to initiating rulemaking lies squarely with the petitioner – ADEQ. The Department and Commission have had eight Regular Legislative Sessions since 1993 in which to address the issue of “unduly cumbersome” analysis, but have chosen not to do so. Today, the Department’s efforts to shift the analysis responsibility onto the general public during review, notwithstanding the “unduly cumbersome” nature of the economic impact calculus, creates a precedent that is contrary to the purpose and Legislative intent of Act 1264 of 1993.

Response: The Department acknowledges this comment and respectfully disagrees with the AEF on most points. The Department acknowledges the oversight that left language about the

toxic substances amendments in the EI/EB analysis after those amendments were withdrawn at the request of AEF.

Regulation 8 requires the petitioner to answer the questions on the EI/EB analysis form using “information readily available.” The Department believes that specific economic data of the sort contemplated by AEF is not “readily available.” Throughout the process of initiating the rulemaking the Commission instructed the Department to reevaluate the analysis and instructed AEF and other interested parties to present economic information to the Department. AEF and other interested parties did not provide any additional data regarding economic impacts to the Department; therefore, specific economic data regarding economic impacts was not “readily available” for use in an EI/EB analysis at the time of initiation of the rulemaking. Only BWD provided economic data to the Department when requested by the Commission.

However, the Department respected the position of the Commission and the concerns presented by AEF and, during the public comment period, the Department revised the EI/EB analysis – the acceptable procedure pursuant to Reg. 8.813 regarding comments on the original EI/EB analysis. The revised EI/EB analysis is attached to this Responsive Summary as “Exhibit B” and is hereby incorporated by reference.

Requirement for Water Quality Standards

AEF

Comment: ADEQ should clarify that the standards in Reg. 2 apply only to waters of the United States. The requirement to adopt water quality standards, as referenced in paragraph 1 of ADEQ’s Petition to Initiate Rulemaking, is mandated under the Federal Water Pollution Control Act. Section 303(c)(2) of the FWPCA (33 U.S.C. §1313(c)(2)) indicates that changes to water quality standards apply to “navigable waters”, which is defined in Section 502(7) of the FWPCA (33 U.S.C. §1362(7)), as waters of the United States. Furthermore, EPA water quality standard regulations at 40 C.F.R §130.2(d) and §131.3(i) define water quality standards as “designated uses for the waters of the United States and water quality criteria for such uses.”

As indicated in ADEQ’s petition and other materials presented by the Department, the proposed changes to Reg. 2 have been initiated at the insistence of the EPA. Application of water quality standards in Reg. 2 to waters that are not waters of the United States would render Reg. 2 more stringent than federal requirements. As a result, ADEQ should clarify that the proposed standards in Reg. 2 apply only to waters of the United States.

Response: States are required to review water quality standards periodically. 33 U.S.C. § 1313(c). The Arkansas legislature, through the Arkansas Water and Air Pollution Control Act (hereinafter “the Act”), Ark. Code Ann. § 8-4-201 *et seq.*, has charged the Commission with the power and duty to promulgate rules and regulations, including *water quality standards* and the classification of the *waters of the state.*” Ark. Code Ann. § 8-4-201(b)(1)(A) (emphasis added). Likewise, Ark. Code Ann. § 8-4-202(a) & (b)(3) states that the Commission has the power and duty to adopt rules and regulations which include “water quality standards.” Accordingly, Regulation No. 2, entitled “Regulation Establishing Water Quality Standards for Surface *Waters of the State* of Arkansas” was promulgated by the Commission and, under the Act, applies to all waters of the State.

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**STATE OF ARKANSAS
2010 INTEGRATED WATER QUALITY MONITORING
AND ASSESSMENT REPORT**

PART II - CHAPTER 3 - COST /BENEFIT ANALYSIS

The CWA requires states to provide an “estimate of the environmental, economic and social costs and benefits needed to achieve the objectives of the CWA and an estimate of the date of such achievement.” A comparable procedure is needed to conduct a state-wide economic analysis of environmental, economic and social costs. However, that procedure does not currently exist.

A true costs/benefits assessment (CBA) will require assessment of the value of incremental improvements in water quality from a variety of programs, some of which were implemented within the previous reporting cycle (Phase 2 storm water Regulations, for example). Water quality assessment methodologies presently are inadequate to truly capture the benefits of CWA implementation on water quality. While ADEQ has monitored water quality as directed by CWA § 305(b) guidance provided by the EPA, these protocols are biased towards reporting failures, with little provision for reporting successes.

USEPA implemented the Wadeable Streams Assessment Protocol (WSAP) for statistically assessing water quality of wadeable streams across the central and eastern US during FY 2004 to address this concern. ADEQ participated in this process through the University of Arkansas, sampling 30 randomly selected sites in Arkansas across four ecoregions, in collaboration with USEPA Region 6. Those data are not yet available for reporting, but will be available by the next reporting cycle, and will be included in that analysis at that time.

Recent advances in valuing benefits such as ecological services may provide insight into the true benefits of CWA regulations that have not been represented economically in previous assessments. However, protocols for including those benefits are not yet established. Therefore, pertinent accessible information has been utilized for this water quality CBA in order to provide the required information under the CWA. Future water quality reports will provide a more comprehensive CBA that will address questions critical for the effective management of water quality in Arkansas.

Cost Information

It is difficult to separate out the costs attributable to water quality pollution control efforts across state, regional, and local governments. The environmental benefits from the environmental resources protected by ADEQ are more important than ever, as evidenced by implementation of programs by agency personnel across Arkansas.

The costs for implementing CWA regulations are summarized in this report as agency programmatic implementation expenses, pollution abatement capital expenditures and operating costs for Arkansas. Much of the water quality related budget is self-generated through permit fees; however, a portion is derived through federal grants (Table II-1). These include the \$104 grant for research investigations, training and informational demonstrations; \$106 grant for water

Table II-1. Summary of Costs
Associated With Implementing CWA Programs in Arkansas for FY 2005.

Funding Source	Principal Activities	Program Cost (FY 2005)
State Budget - ADEQ	Permitting and enforcing CWA provisions in Arkansas	\$3,699,586
State Budget - ANRC	Nonpoint source pollution prevention, control, and remediation	\$3,260,900
Federal CWA §104 Budget	Assess overall quality and ecological characteristics of Arkansas's water bodies	\$315,000
Federal CWA §106 Budget	General water pollution control/water quality management program	\$2,683,019
Federal CWA §319 Budget	Prevent, control, and remediate nonpoint source pollution throughout Arkansas	\$3,800,000
Federal CWA §604 Budget	Survey work on streams not meeting designated uses	\$100,000
	TOTAL	\$13,858,505

pollution control activities; the §319 grant for nonpoint source management issues, and the §604 grant for state water quality management planning activities. Money from each of these grants is divided throughout the appropriate water-quality related state program as directed by each grant, and provides funding for personnel, equipment, survey and research work, and ambient monitoring. Total costs for FY2005 were estimated at over \$13.8 million (Table II-1)

State of Arkansas Budget for Water Quality Control Activities

The ADEQ has primary responsibility for permitting and enforcement of CWA provisions in Arkansas, but the implementation of water quality control activities are distributed across several state agencies, including ADEQ, ANRC, Arkansas Department of Health (ADOH), Rural Water Association of Arkansas (RWA), and the Arkansas Division of Agriculture (ADA), among others. The state budget for ADEQ water quality control activities for 2005 included \$896,525 in general program funds, \$73,283 in waste water licensing, \$2,624,443 in permit fees, and \$105,335 in environmental education fees, for a total of \$3,699,586 (Table II-1). Funds received through penalties, fines, and other actions are returned to State funds for redistribution. In FY 2005, ANRC and its partners spent \$3,260,900 in non-federal funds for nonpoint source pollution prevention, control, and remediation.

Federal CWA Section 104 Budget

Research monies provided by §104 grants support the activities within ADEQ to assess overall quality and ecological characteristics of Arkansas's water bodies. In 2005 ADEQ received \$315,000 in Federal funding for these activities.

Federal CWA Section 106 Budget

The §106 grant program provides funding for ADEQ's general water pollution control/water quality management program. Activities funded under the §106 grant include ambient water quality monitoring, assessment of ambient water quality data, development of the *Water Quality Inventory* (now known as the Integrated Report), revision of Arkansas's Water Quality Management Plan, development and revision of surface water quality standards, development and issuance of waste water discharge permits, compliance inspections, complaint investigations, and development of enforcement actions. In 2005 ADEQ received \$2,683,019 in Federal funding for these activities.

Federal CWA Section 319 Budget

The CWA §319 grant for nonpoint source management issues in Arkansas is implemented by the Arkansas Department of Natural Resources (ADNR). ADNR works with universities, city and regional officials, private industry, and the federal government to prevent, control, and remediate nonpoint source pollution throughout Arkansas. In 2005 ANRC completed 39 multi-year projects, managed 26 on-going projects, and initiated 19 new projects that target NPS pollutants from urban runoff, forestry, agriculture, sand and gravel operations, and on-site waste treatment systems. Furthermore, ANRC worked with the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service to implement 26 Best Management Practices (BMPs) designed to improve environmental quality on more than 1,100 Arkansas farms. This has resulted in load reductions of more than 50,000 lbs phosphorus, 176,000 lbs nitrogen, and 24,000 lbs of sediment in 2005 within Arkansas. ANRC continues to work closely with USDA to make progress in reducing nonpoint source pollutants and improving water quality. Part II, Chapter 2, Nonpoint Source Pollution Control has more information on this topic as well as other efforts by the Nonpoint Source Program (see ANRC 2005 Annual Report, ANRC, Little Rock, AR). In 2005 ANRC received \$3,800,000 in Federal funding for these activities.

Federal CWA Section 604 Budget

Section 604 grant monies are used to fund survey work on streams not meeting designated uses. These surveys provide data for development of total maximum daily loads (TMDL) and waste load allocations (WLA). This data assists permit writers in establishing water quality protective effluent limits for dischargers. In 2005 ADEQ received \$100,000 in Federal funding for these activities.

Benefits Information

Arkansas has over 283,000 hectares (699,293 acres) of surface water with some 11,900 miles of streams and rivers and more than 500,000 acres of lakes. Over 800 billion liters of high quality groundwater are contained in aquifers capable of yielding over 2,000 liters per minute. 1 Agriculture, Forestry & Fishing Industry accounted for \$3.154 billion or 3.9% of Arkansas Gross State Product (GSP) in 2004 (Arkansas GSP: \$80.902 billion).²

Fishing and Aquaculture Benefits

Arkansas is renowned for fishing and hunting, as well as a myriad of water related recreational activities including sailing and scuba diving. Many of the streams in Arkansas are utilized for recreational floating. The quality of recreational fishing is directly related to the quality of surface water in Arkansas. Three current world-record fish (brown trout, walleye and hybrid bass) were hooked in Arkansas waters. There are 18 high-profile waterways for canoeing/rafting/kayaking in Arkansas: Big Piney Creek, Buffalo River, Caddo River, Cadron Creek, Cossatot River, Crooked Creek, Eleven Point River, Illinois Bayou, Kings River, Little Missouri River, Little Red River, Mulberry River, Ouachita River, Saline River, Spring River, Strawberry River and White River.³

Arkansas is an important state nationally for aquaculture. Specifically, Arkansas ranks second in the U.S. in catfish production, and leads the nation in baitfish, goldfish, sport-fish, largemouth bass, hybrid striped bass, and Chinese carp production. Aquaculture has a total economic impact of over \$1.1 billion in Arkansas, primarily in the impoverished Delta region. In Chicot County alone, the catfish industry accounted for 2,665 jobs and \$22 million in tax revenue.⁴

Recreational fishing is a major tourist attraction for Arkansas contributing \$446 million to the state's economy annually through direct expenditures. In 2001, 782,000 people (residents and non-residents) over the age of 16 fished a total of more than 13,000 days. They spent almost \$184 million on trip-related expenses, and almost \$208 million on equipment. Thus, aquaculture and fishing, which benefit directly from water quality, provide \$1,456 million in direct and indirect benefits to the State of Arkansas.⁵

1 Information concerning water surface and the Agriculture as a % of GSP is available at the Arkansas Department of Economic Development website:
http://www.1800arkansas.com/data_demographics/files/Arkansas%20Profile2005.pdf

2 Information concerning the dollar values of Agriculture industry and GSP is available at the Bureau of Economic Analysis website:
<http://www.bea.gov/bea/regional/gsp.htm>

3 Information is available at the Arkansas Department of Parks and Tourism website:
<http://www.arkansas.com/outdoors/default.asp>
<http://www.arkansas.com/outdoors/fishing/>
<http://www.arkansas.com/outdoors/Canoeing-Rafting-Kayaking/>

4 The Aquaculture/Fisheries Center of Excellence at the University of Arkansas at Pine Bluff.
<http://www.uaex.edu/aqfi/research/>

5 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, Arkansas, U.S. Department of the Interior, Fish and Wildlife Service and U.S. Department of Commerce, U.S. Census Bureau

Hunting Benefits

The most recent year for which data exists regarding the economic impact of hunting is 2001. In that year, Arkansas had 430,694 registered hunters with an economic impact for all hunting-related activities of \$905,815,861 based on direct, indirect, and induced effects. The impact of deer hunting during that period was over 42 percent of the total value, or \$383,007,221. The economic impact of migratory waterfowl and upland bird hunting was almost 30 percent of the total, or \$270,286,245. Clearly, not all of this nearly billion dollar industry is dependent on or resulting from water quality, but a significant portion of the deer and migratory waterfowl industry benefits from and is dependent upon well managed water resources. A conservative estimator of the benefit derived from high quality water for those two hunting components would be 50 percent, resulting in a direct benefit of approximately \$327 million in total benefit from hunting.⁶

Eco-Tourism Benefits

Eco-tourism in Arkansas is calculated as the combination of watchable wildlife recreation (particularly bird watching) and general tourism less special attractions, hunting, fishing, and historic tourism. For 2001, the most recent year for which data is available, 841,000 people participated in watchable wildlife activities. Anecdotal evidence suggests the number of ecotourists visiting Arkansas has escalated significantly with the possible discovery of the ivory-billed woodpecker in the Cache River area, but hard data are not yet available. The total economic benefit of wildlife-watching in Arkansas in 2001 was almost \$456 million, most of which was for equipment (Table II-2).

The Arkansas tourism industry experienced a year of record growth in 2004, with travel expenditures increasing from \$3,942,501,328 to \$4,253,958,933 (7.9%). Visitors increased from 19,668,336 to 20,691,089 (5.2%). These estimates are calculated using the *Travel Industry Association of America (TIA) 2001 Impact of Travel on Arkansas Counties* as a reference. During 2004, visitors to Arkansas totaled 20,691,000 person-trips. Visitors spent an average of \$205.60 per trip, resulting in \$4.3 billion in total travel expenditures, \$238 million in state taxes and \$89 million in local taxes. The Arkansas travel industry employed 59,287 persons and paid \$940 million in wages and salaries. When asked the main purpose of their trip during Welcome Center Surveys, visitors surveyed responded in order of preference: visiting friends or relatives (39%), sightseeing (18%), entertainment (15%), business (9%), recreation (9%), family affairs (7%) and other (3%). According to the Internet Conversion Study (2004), tourists participated in the following activities: sightseeing 36.8%, attractions 7.0%, historic sites 3.9%, camping 16.0%, hiking 5.1%, fishing/hunting 6.7%, water sports 4.4%, bird watching 0.3%, other 7.8 percent.⁷ Separating bird watching from the total, the remaining eco-tourism benefit statewide during 2004 was estimated at 25.5 percent of total tourism. A conservative estimate of the economic benefit derived from well-managed water resources to ecotourism would be half of all ecotourism, or 13 percent of the total, for an economic benefit of more than \$553 million plus half of bird-watching, \$237 million, for a total impact of \$790 million. The perception of clean water is central to the advertising campaign of Arkansas as the "Natural State".

⁶ 2001 Economic Importance of Hunting in America, The Animal Use Issues Committee of the International Association of Fish and Wildlife Agencies, Washington, DC

⁷ Arkansas Tourism Report 2004, Arkansas Department of Parks and Tourism, Littlerock, AR

Table II-2: 2001 Economic Impacts of Watchable Wildlife Recreation in Arkansas

	Resident	Non-Resident	Total
Retail sales	\$232.0 million	\$11.9 million	\$244.0 million
Salaries & wages	\$101.2 million	\$ 4.8 million	\$106.0 million
Full & part-time jobs	4,532	238	4,770
Tax revenues:			
State sales tax	\$12.0 million	\$957,000	\$12.9 million
State income tax	\$5.0 million	\$260,000	\$5.2 million
Federal income tax	\$14.9 million	\$783,000	\$15.7 million
Total economic effect	\$454.1 million	\$21.7 million	\$475.7 million

Data source: The 2001 Economic Benefits of Watchable Wildlife Recreation in Arkansas (Report prepared for the Arkansas Game and Fish Commission.)

Water-Critical Industry Benefits

The principal industries in Arkansas are manufacturing, agriculture, forestry, business services and tourism (Table II-3). These industries are dependent upon, and thus benefit from, high quality water resources. Determining the direct benefits from CWA implementation to these industries is difficult due to a wide variety of intermingled variables. However, a conservative estimate of the benefit of implementing the CWA 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 for high quality water. The benefit to industries in Arkansas from implementing the CWA was estimated to be \$1,049 million.

Summary of Benefits

The cumulative benefits of implementing CWA programs in Arkansas for FY 2005 were estimated to be more than \$3.7 billion (Table II-4). These benefits are rough estimates made with a variety of assumptions, many arbitrary in their magnitude. However, these assumptions were conservative (that is, likely underestimated) and based upon the most recent data available. In addition, these estimates do not consider other critical benefits that were not available for this CBA, including the cost of water treatment for drinking water, the health effects of untreated poor quality water, etc.

Cost/Benefit Assessment

In conclusion, based upon the data collected, analyzed, and reported in this CBA, the costs for implementing the CWA in Arkansas in FY 2005 were approximately \$13.86 million, and benefits were \$3,712 million. Thus, the State of Arkansas received more than 267 times return on each dollar invested in implementing the CWA in FY2005.

Table -3: Economic Benefits from Industries in Arkansas by Category, 2004

Industry Category	2004 Revenues (million)	Percent GSP (\$80.902 billion)
Agriculture, Forestry & Fishing	\$3,154	3.9
Nondurable Goods Manufacturing industry	\$7,095	8.8
Accommodation and Food Services industry	\$1,784	2.2
TOTAL	\$12,033	14.9

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

*Table -4: Summary of Benefits
Associated With Implementing CWA Programs in Arkansas for FY 2005.*

Economic Source	Principal Activities	Economic Benefits (Million)
Fishing	Aquaculture and recreational fishing	\$1,546
Hunting	Migratory waterfowl and riparian game (deer, upland game birds)	\$327
Ecotourism	Bird watching, recreational water sports, etc.	\$790
Water-Critical Industries	Ag, forestry, manufacturing, accommodations, etc.	\$1,049
	TOTAL	\$3,712



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.*

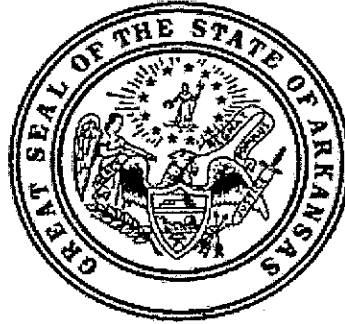
<p style="text-align: center;">STEP 2: THE ANALYSIS (to be included in petition to initiate rulemaking, if required)</p>
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Directions for Analysis Completion:

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 AND ECOLOGY COMMISSION



REGULATION NO. 2

REGULATION ESTABLISHING WATER QUALITY STANDARDS FOR SURFACE WATERS OF THE STATE OF ARKANSAS

Adopted by the Arkansas Pollution Control and Ecology Commission on (October 26, 2007)

Submitted to the PC&E Commission in May 2010

Arkansas Pollution Control and Ecology Commission
Regulation No. 2, As Amended

**Regulation Establishing
Water Quality Standards for Surface Waters
of the State of Arkansas**

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**ARKANSAS
POLLUTION CONTROL
AND ECOLOGY COMMISSION**

Regulation No. 2, As Amended

**Regulation Establishing
Water Quality Standard for Surface Waters
of the State of Arkansas**

CHAPTER 1: AUTHORITY, GENERAL PRINCIPLES, AND COVERAGE

Reg. 2.101 Authority

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), and in compliance with the requirements of the Federal Water Pollution Control Act, as amended, the Arkansas Pollution Control and Ecology Commission, (hereinafter referred to as "Commission") hereby promulgates this Regulation No. 2, as amended, establishing water quality standards for all surface waters, interstate and intrastate, of the State of Arkansas.

Reg. 2.102 Purpose

The water quality standards herein set forth are based upon present, future and potential uses of the surface waters of the State and criteria developed from statistical evaluations of past water quality conditions and a comprehensive study of least-disturbed, ecoregion reference streams. The standards are designed to enhance the quality, value, and beneficial uses of the water resources of the State of Arkansas, to aid in the prevention, control and abatement of water pollution, to provide for the protection and propagation of fish and wildlife and to provide for recreation in and on the water. In establishing these standards, the Commission has taken into consideration the use and value of the streams for public water supplies, commercial, industrial and agricultural uses, aesthetics, recreational purposes, propagation of fish and wildlife, other beneficial uses, and views expressed at public hearings. The State of Arkansas has an exceptionally large volume of high quality water. With few exceptions the streams and lakes of Arkansas contain waters of a quality suitable for all legitimate uses without the necessity of unreasonable water treatment. Where man-made pollution exists, substantial progress has been made in abatement. It is the purpose of these regulations to preserve and protect the quality of this water so that it shall be reasonably available for all beneficial uses and thus promote the social welfare and economic well-being of the people of the State. It is further the purpose of these regulations to designate the uses for which the various waters of the State shall be maintained and protected; to prescribe the water quality standards required to sustain the designated uses; and to prescribe regulations necessary for implementing, achieving and maintaining the prescribed water quality.

Chronic toxicity: A statistically significant difference (at the 95 percent confidence level) in mortality or immobilization, reduced reproduction or limited growth between test organisms and a control measured during a substantial segment of the life span of the test organism.

Commission: The Arkansas Pollution Control and Ecology Commission.

Continuing Planning Process (CPP): ~~A document which describes the principal processes of the State's water quality management programs. The CPP is not a regulation.~~

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.

Critical flows: The flow volume used as background dilution flows in calculating concentrations of pollutants from permitted discharges. These flows may be adjusted for mixing zones. The following critical flows are applicable:

For a seasonal fishery - 1 cubic foot per second (cfs) minus the design flow of any point source discharge (may not be less than zero).

For human health criteria - ~~a permittee may use~~ the harmonic mean flow or long term average flow.

For minerals criteria - ~~a permittee may use~~ harmonic mean flow or 4 cfs, ~~with the following exception:~~ except in those waters listed in Reg. 2.511. Those waters in Reg. 2.511 which are noted with an asterisk will have a critical flow of 4 cfs.

For waters listed as Extraordinary Resource Waters, Ecologically Sensitive Waters, or waters impaired for minerals, use harmonic mean flow.

For all others waters standards use the critical flow ~~will be~~ of Q7-10.

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

Critical season: That period of the year when water temperatures exceed 22°C. This is normally the hot, dry season and after the majority of the fish spawning activities have ceased. This season occurs during a different time frame in different parts of the state, but normally exists from about mid-May to mid-September.

Cumulative: Increasing by successive additions.

Department: The Arkansas Department of Environmental Quality (~~ADEQ~~), or its successor.

Degradation: The act or process of causing any decrease in quality.

Design flow: A facility discharge flow of process wastewater that is authorized in a NPDES permit.

Impairment: Exceedences of the water quality standards by a frequency and/or magnitude which results in any designated use of a waterbody to fail to be met as a result of physical, chemical or biological conditions.

Indicator species: Species of fish which may not be dominant within a species group and may not be limited to one area of the state, but which, because of their presence, are readily associated with a specific ecoregion. All indicator species need not be present to establish a normal or representative fishery.

Indigenous: Produced, growing or living naturally in a particular region or environment.

Interstate: Of, connecting, or existing between two or more states.

Intrastate: Existing or occurring within a state.

Ionizing radiation: Gamma rays and x-rays; alpha and beta particles, high speed electrons, neutrons, protons and other nuclear particles; but not sound or radio waves, or visible, infrared or ultraviolet light.

Key species: Fishes which are normally the dominant species (except for some ubiquitous species) within the important groups such as fish families or trophic feeding levels. All specified key species need not be present to establish a normal or representative fishery.

Long term average flow: An average annual stream flow based on a period of record which reflects the typical annual variability.

Maximum contaminant level (MCL): The highest level of a contaminant that is allowed in drinking water. Maximum contaminant levels are set as close to maximum contaminant level guidelines goals as feasible using the best available treatment technology and taking cost into consideration.

Milligrams per liter (mg/L): The concentration at which one milligram is contained in a volume of one liter; one milligram per liter is equivalent to one part per million (ppm) at unit density.

Mixing zone: An area where an effluent discharge undergoes mixing with the receiving waterbody. For toxic discharges a zone of initial dilution, ~~(ZID)~~ may be allowed within the mixing zone.

Mouth: The point of confluence where a stream enters a larger body of water.

Natural background: Ambient conditions or concentrations of a parameter due to non-anthropogenic sources; natural background does not typically interfere with support of designated uses nor the level of aquatic life biota expected to occur naturally at the site.

Naturally occurring excursions: Temporary deviation from natural background due to natural events such as severe storm events, drought, temperature extremes, etc.

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), agricultural or silvicultural runoff, irrigation return flows, etc. and other sources of diffuse runoff."

NTU (Nephelometric Turbidity Unit) (NTU): A measure of turbidity based upon a comparison of the intensity of light scattered by a sample of water under defined conditions with the intensity of light scattered by a standard reference suspension; NTU are considered comparable to the previously reported JTU (Jackson Turbidity Units) (JTU). May also be reported as FTU (Formazin Turbidity Units) (FTU) in equivalent units.

Nuisance species: Those organisms capable of interfering with the beneficial use of water.

Nutrient: Any substance assimilated by an organism which promotes growth and replacement of cellular constituents. The usual nutrient components of water pollution are nitrogen, phosphorus and carbon.

Objectionable algal densities: Numbers of total algae which would interfere with a beneficial use.

Persistent: Degraded only slowly by the environment.

pH: The negative logarithm of the effective hydrogen-ion concentration in gram equivalents per liter.

Picocurie: One trillionth (10^{-13}) of a curie which is a unit of quantity of any radioactive nuclide in which 3.7×10^{10} disintegrations occur per second.

Point source: A discharge from a discrete point.

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

Primary season: That period of the year when water temperatures are 22°C or below. This includes the major part of the year from fall through spring, including the spawning season of most fishes. It normally occurs from about mid-September to mid-May.

Primary season critical flow: A flow volume equal to the lowest mean discharge during 7 consecutive days during the period when stream flows increase substantially and water temperatures are cooler and, on the average, occurs once in every 10 years. In streams with watersheds less than 10 mi² this flow is one (1) CFS minus the design flow of any point source discharge.

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

Regulated-flow stream: Those streams restricted by structures which have the ability to control stream flow.

Attainability Analyses. Other scientific methods, including the use of existing technical data, may be used for justifying the removal of a designated use; provided the methods are agreed upon prior to the study. Such other methods may include the use of information previously gathered through technical studies and/or use attainability analysis. Use attainability analysis procedures may be found in the State of Arkansas Continuing Planning Process document (CPP). Any waterbody on which a use attainability analysis is approved shall be so listed in Appendix A with appropriate criteria.

Reg. 2.304 Physical Alteration of Habitat

~~(A) Significant physical alterations of the habitat within eExtraordinary rResource wWaters, eEcologically sSensitive wWaterbodies or nNatural and sScenic wWaterways are not will only be allowed where water quality, natural flow regime, and habitat of fish, shellfish, or other forms of aquatic biota will be maintained and protected, and there is no feasible alternative to the proposed project. For the purposes of this subsection, the Director may determine that a proposed physical alteration of the habitat is not significant if it is demonstrated that:~~

- ~~(1) the proposed physical alteration of habitat (a) will not impair water quality; (b) will not impair the natural flow regime; and (c) will not impair the habitat of fish, shellfish or other forms of aquatic life; and~~
- ~~(2) there is no feasible alternative to the proposed project.~~

~~A request under this subsection for a determination that a proposed physical alteration of habitat is not significant shall be submitted to the Director in accordance with the procedures set forth in Appendix D.~~

~~(B) In other waters, where significant physical alterations of the habitat are proposed, the Department must be assured that no significant degradation of any existing use or water quality necessary to protect that use will occur. In order to make such determinations, the Department may require an evaluation of all practicable alternatives to the project including: an environmental assessment of the impacts of each alternative, an engineering and economic analysis, and a socio-economic evaluation of the project in the local area.~~

Significant physical alterations of the habitat within extraordinary resource waters, ecologically sensitive waterbodies or natural and scenic waterways are not allowed. In other waters, where significant physical alterations of the habitat are proposed, the Department must be assured that no significant degradation of any existing use or water quality necessary to protect that use will occur. In order to make such determinations, the Department may require an evaluation of all practicable alternatives to the project including: an environmental assessment of the impacts of each alternative, an engineering and economic analysis, and a socio-economic evaluation of the project in the local area.

Reg. 2.305 Short Term Activity Authorization

The Director may authorize, with whatever conditions deemed necessary and without public notice, short term activities which might cause a violation of the Arkansas Water Quality Standards. This authorization is subject to the provisions that such activity is essential to the protection or promotion of the public interest and that no permanent or long-term impairment of beneficial uses is likely to result from such activity. Nothing herein shall be intended to supersede existing state and federal permitting processes or requirements.

CHAPTER 4: GENERAL STANDARDS

Reg. 2.401 Applicability

The general standards outlined below are applicable to all surface waters of the State at all times unless otherwise designated in Appendix A. They apply specifically with regard to substances attributed to discharges, nonpoint sources or instream activities as opposed to natural phenomena. Waters may, on occasion, have natural background levels of certain substances outside the limits established by these criteria, in which case these criteria do not apply.

Reg. 2.402 Nuisance Species

All waters shall be free from substances attributed to man-caused point or nonpoint source discharges in concentrations that produce undesirable aquatic life biota or result in the dominance of nuisance species.

Reg. 2.403 Methods

The methods of sample collection, preservation, measurements and analyses shall be in accordance with the EPA's *Guidelines Establishing Test Procedures for the Analysis of Pollutants* (40 CFR, Part 136) or other proven methods acceptable to the Department.

Reg. 2.404 Mixing Zones

Mixing zones are allowed for all parameters not specifically excluded in Reg. 2.404 and the effects of wastes on the receiving stream shall be determined after the wastes have been thoroughly mixed with the mixing zone volume. Outfall structures should be designed to minimize the extent of mixing zones to ensure rapid and complete mixing.

For aquatic life toxic substances in larger streams, (those with Q7-10 flows equal to or greater than 100 cfs), the zone of mixing shall not exceed 1/4 of the cross-sectional area and/or critical flow volume of the stream. The remaining 3/4 of the stream shall be maintained as a zone of passage for swimming and drifting organisms, and shall remain of such quality that stream ecosystems are not significantly affected. In the smaller streams, (Q7-10 flows less than 100 cfs), because of varying local physical and chemical conditions and biological phenomena, a site-specific determination shall be made on the percentage of river width necessary to allow passage of critical free-swimming and drifting organisms so that negligible or no effects are produced on their populations. As a guideline, no more than 2/3 of the cross-sectional area and/or critical flow volume of smaller streams should be devoted to mixing zones thus leaving at least 1/3 of the cross-sectional area free as a zone of passage.

Mixing zones are not allowed for the parameters of bacteria, ~~pH~~, or oil and grease, or where the background flow is less than the critical flow or where the background concentration of a waste parameter exceeds the specific criteria for that waste parameter.

Reg. 2.503 Turbidity

There shall be no distinctly visible increase in turbidity of receiving waters attributable to municipal, industrial, agricultural, other waste discharges or instream activities. Specifically, in no case shall any such waste discharge or instream activity cause turbidity values to exceed the base flows values listed below. Additionally, the non-point source runoff shall not result in the exceedance of the in stream all flows values in more than 20% of the ADEQ Arkansas Department of Environmental Quality ~~ambient~~-monitoring network samples taken in not less than ~~24 monthly~~ 12 samples.

Waterbodies	Base Flows Values (NTU)	All Flows Values (NTU)
Streams		
Ozark Highlands	10	17
Boston Mountains	10	19
Arkansas River Valley	21	40
Ouachita Mountains	10	18
Springwater-influenced Gulf Coastal	21	32
Typical Gulf Coastal	21	32
Least-Altered Delta	45	84
Channel-Altered Delta	75	250
Arkansas River	50	52
Mississippi River	50	75
Red River	50	150
St. Francis River	75	100
Trout	10	15
Lakes and Reservoirs	25	45

Reg. 2.504 pH

The pH standards of between 6.0 and 9.0 are applicable. 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 below 6.0 or above 9.0 during a period of 24 hours, and pH values shall not be below standards 6.0 or above 9.0 are applicable to all waters of the state, except in those waterbodies where natural background conditions result in pH values to either be less than or greater than the criteria listed.

Reg. 2.505 Dissolved Oxygen

The following dissolved oxygen standards ~~must be met~~ are applicable:

Waterbodies	Limit (mg/l <u>mg/L</u>)	
	Primary	Critical
Streams		
Ozark Highlands		
<10 mi ² watershed	6	2
10 to 100 mi ²	6	5
>100 mi ² watershed	6	6
Boston Mountains		
<10 mi ² watershed	6	2
>10 mi ² watershed	6	6
Arkansas River Valley		
<10 mi ² watershed	5	2
10 mi ² to 150 mi ²	5	3
151 mi ² to 400 mi ²	5	4
>400 mi ² watershed	5	5
Ouachita Mountains		
<10 mi ² watershed	6	2
>10 mi ² watershed	6	6
Typical Gulf Coastal		
<10 mi ² watershed	5	2
10 mi ² to 500 mi ²	5	3
>500 mi ² watershed	5	5
Springwater-influenced Gulf Coastal		
All size watersheds	6	5
Delta (least-altered and channel altered)		
<10 mi ² watershed	5	2
10 mi ² to 100 mi ²	5	3
>100 mi ² watershed	5	5
Trout Waters		
All size watersheds	6	6

In streams with watersheds of less than 10 mi², it is assumed that insufficient water exists to support a fishery ~~fish community as described in Reg. 2.302~~ during the critical season. During this time, a ~~D.O.~~ dissolved oxygen standard of ~~2 mg/l~~ 2 mg/L will apply to prevent nuisance conditions. However, field verification is required in areas suspected of having significant groundwater flows or enduring pools which may support unique aquatic biota. In such waters the critical season standard for the next size category of stream shall apply.

All streams with watersheds of less than 10 mi² are expected to support a fishery ~~fish community as described in Reg. 2.302~~ during the primary season when stream flows, including discharges, equal or exceed 1 cubic foot per second (CFS) (cfs). However, when site verification indicates that a fishery ~~fish community as described in Reg. 2.302~~ exists at flows below 1 CFS cfs, such fishery will be protected by the primary standard (Please refer to the State of Arkansas Continuing Planning Process for field verification requirements).

Also, in these streams with watersheds of less than 10 mi², where waste discharges are 1 CFS cfs or more, they are assumed to provide sufficient water to support a perennial fishery ~~fish community as described in Reg. 2.302~~ and, therefore, must meet the dissolved oxygen standards of the next size category of streams.

For purposes of determining effluent discharge limits, the following conditions shall apply:

- (A) The primary season dissolved oxygen standard is to be met at a water temperature of 22°C (71.5°F) and at the minimum stream flow for that season. At water temperatures of 10°C (50°F), the dissolved oxygen standard is 6.5 mg/l mg/L.
- (B) During March, April and May, when background stream flows are 15 CFS cfs or higher, the ~~D.O.~~ dissolved oxygen standard is 6.5 mg/l mg/L in all areas except the Delta Ecoregion, where the primary season ~~D.O.~~ dissolved oxygen standard will remain at 5 mg/l mg/L.
- (C) The critical season dissolved oxygen standard is to be met at maximum allowable water temperatures and at Q7-10 flows. However, when water temperatures exceed 22°C (71.6°F), a 1 mg/l mg/L diurnal depression will be allowed below the applicable critical standard for no more than 8 hours during any 24-hour period.

Lakes and Reservoirs

Specific dissolved oxygen standards for lakes and reservoirs shall be 5 mg/l mg/L. Effluent limits for oxygen-demanding discharges into impounded waters are promulgated in Regulation No. 6 of the Arkansas Pollution Control and Ecology Commission. However, the Commission may, after full satisfaction of the intergovernmental coordination and public participation provisions of the State of Arkansas state's eContinuing pPlanning pProcess, establish alternative limits for dissolved oxygen in lakes and reservoirs where studies and other relevant information can demonstrate that predominant ecosystem conditions may be more accurately reflected by such alternate limits; provided that these limits shall be compatible with all designated beneficial uses of named lakes and reservoirs.

(D) Primary Contact Season - May 1 and to September 30.

(E) Secondary Contact Season - October 1 to April 30.

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:

<u>Contact Recreation Seasons</u>	<u>Limit (col/100ml)</u>			
	<u>E. coli</u>		<u>Fecal Coliform</u>	
<u>Primary Contact</u>	<u>IS¹</u>	<u>GM²</u>	<u>IS¹</u>	<u>GM²</u>
<u>ERW, ESW, NSW, Reservoirs,</u>	<u>298</u>	<u>126</u>	<u>400</u>	<u>200</u>
<u>Lakes</u>				
<u>All Other Waters</u>	<u>410</u>	<u>-</u>	<u>400</u>	<u>200</u>
<u>Secondary Contact</u>				
<u>ERW, ESW, NSW, Reservoirs,</u>	<u>1490</u>	<u>630</u>	<u>2000</u>	<u>1000</u>
<u>Lakes</u>				
<u>All Other Waters</u>	<u>2050</u>	<u>-</u>	<u>2000</u>	<u>1000</u>

1 – Individual Sample Criteria

2 – Geometric Mean – Calculated on a minimum of five samples spaced evenly and within a thirty-day period.

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.

Reg. 2.508 Toxic Substances

~~Toxic substances shall not be present in receiving waters, after mixing, in such quantities as to be toxic to human, animal, plant or aquatic life biota or to interfere with the normal propagation, growth and survival of the indigenous aquatic biota. 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 life biota, or will not interfere with the normal propagation, growth, and survival of the indigenous aquatic biota. Acute toxicity standards may not be exceeded apply outside the zone of initial dilution (ZID). Within the ZID acute toxicity standards may be exceeded but acute toxicity may not occur. Chronic toxicity and chronic numeric toxicity standards shall not be exceeded apply at, or beyond, the edge of the mixing zone. Permitting of all toxic substances shall be in accordance with the toxic implementation strategy found in the State of Arkansas Continuing Planning Process. For non permit issues and as a guideline for evaluating toxic substances not listed in the following tables, the Department may consider No Observed Effect Concentrations (NOECs) or other literature values as appropriate. For the substances listed below, the following standards shall apply:~~

Reg. 2.509 Nutrients

(A) Materials stimulating algal growth shall not be present in concentrations sufficient to cause objectionable algal densities or other nuisance aquatic vegetation or otherwise impair any designated use of the waterbody. Impairment of a waterbody from excess nutrients ~~is~~ are dependent on the natural waterbody characteristics such as stream flow, residence time, stream slope, substrate type, canopy, riparian vegetation, primary use of waterbody, season of the year and ecoregion water chemistry. Because nutrient water column concentrations do not always correlate directly with stream impairments, impairments will be assessed by a combination of factors such as water clarity, periphyton or phytoplankton production, dissolved oxygen values, dissolved oxygen saturation, diurnal dissolved oxygen fluctuations, pH values, aquatic-life community structure and possibly others. However, when excess nutrients result in an impairment, based upon Department assessment methodology, by any established, numeric water quality standard, the waterbody will be determined to be impaired by nutrients.

(B) Site Specific Nutrient Standards

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

* 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

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.

<u>Facility Design Flow – mgd</u>	<u>Total Phosphorus discharge limit – mg/L</u>
= 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.

Reg. 2.510 Oil and Grease

Oil, grease or petrochemical substances shall not be present in receiving waters to the extent that they produce globules or other residue or any visible, colored film on the surface, or coat the banks and/or bottoms of the watercourses or adversely affect any of the associated biota. ~~As a guideline, oil and grease shall not exceed 10 mg/l average or 15 mg/l maximum when discharging to surface waters.~~ Oil and grease shall not be added to any waterbody in excess of be an average of 10 mg/L or a maximum of 15 mg/L when discharging to surface waters. No mixing zones are allowed for discharges of oil and grease.

Reg. 2.511 Mineral Quality

(A) Site Specific Mineral Quality Criteria

Mineral quality shall not be altered by municipal, industrial, other waste discharges or instream activities so as to interfere with designated uses. The following ~~limits~~ criteria apply to the streams indicated, ~~and represent the monthly average concentrations of~~ chloride (Cl⁻), sulfate (SO₄⁻²) and total dissolved solids (TDS).

<u>Stream</u>	<u>Concentration-mg/L</u>		
	<u>Chloride</u> (Cl ⁻)	<u>Sulfate</u> (SO ₄ ⁻²)	<u>Total</u> <u>Dissolved</u> <u>Solids</u> (TDS)
Arkansas River Basin			
Arkansas River (Mouth to L&D #7 <u>Murry Lock and Dam</u> <u>[L&D #7]</u>)	250	100	500
Bayou Meto (Rocky Branch to Bayou Two Prairie)	64*	ER <u>37.3</u>	ER <u>411.3</u>
<u>Long Pond Slough</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Castor Bayou</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Cross Bayou</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
Bayou Meto (mouth to Bayou Two Prairie)	95**	45**	ER <u>411.3</u>
Bayou Two Prairie (mouth to Rickey Branch)	95**	45**	ER
<u>Bayou Two Prairie (Rickey Branch to Northern</u> <u>boundary of Smoke Hole Natural Area)</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Bayou Two Prairie (Southern boundary of Smoke</u> <u>Hole Natural Area to Mouth)</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Little Bayou Meto</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Bakers Bayou</u>	<u>95</u>	<u>45</u>	<u>411.3</u>

StreamConcentration-mg/L

	<u>Chloride</u> (Cl ⁻)	<u>Sulfate</u> (SO ₄ ⁻²)	<u>Total</u> <u>Dissolved</u> <u>Solids</u> (TDS)
<u>Wabbaseka Bayou</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Indian Bayou</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Flat Bayou</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Shumaker Branch</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Skinner Branch</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>White Oak Branch</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Caney Creek</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Salt Bayou</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Snow Bayou</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Fish Trap Slough</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Ricky Branch</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Blue Point Ditch</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Big Ditch</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Main Ditch</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Plum Bayou</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Crooked Creek Ditch</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Indian Bayou Ditch</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Caney Creek Ditch</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Salt bayou Ditch</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Bradley Slough</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Tupelo Bayou</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Dennis Slough</u>	<u>95</u>	<u>45</u>	<u>411.3</u>

StreamConcentration-mg/L

	<u>Chloride</u> (Cl)	<u>Sulfate</u> (SO ₄ ⁻²)	<u>Total</u> <u>Dissolved</u> <u>Solids</u> (TDS)
<u>Buffalo Slough</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Flynn Slough</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Boggy Slough</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Bear Bayou</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Bubbling Slough</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Five Forks Bayou</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Government Cypress Slough</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Brushy Slough</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Tipton Ditch</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Hurricane Slough</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Newton Bayou</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>West Bayou</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Brownsville Branch</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
<u>Eagle Branch</u>	<u>95</u>	<u>45</u>	<u>411.3</u>
Rocky Branch Creek	64*	ER 37.3	ER 411.3
Arkansas River (<u>L&D #7 Murry Lock and Dam [L&D #7]</u> to <u>L&D #10 Dardanelle Lock and Dam [L&D #10]</u>)	250	100	500
Cadron Creek	20	20	100
Arkansas River (<u>L&D #10 Dardanelle Lock and Dam</u> <u>[L&D #10] to Oklahoma line, including Dardanelle</u> <u>Reservoir</u>)	250	120	500
James Fork	20	100	275
Illinois River	20	20	300
Poteau River from Business Hwy 71 to Stateline	120	60	500
Unnamed trib at Waldron	150	70	660
White River Basin			
White River (Mouth to Dam #3)	20	60	430
Big Creek	20	30	270

StreamConcentration-mg/L

	<u>Chloride</u> (Cl)	<u>Sulfate</u> (SO ₄ ⁻²)	<u>Total</u> <u>Dissolved</u> <u>Solids</u> (TDS)
Unnamed trib from Frit Ind.	ER 48	48*	ER 411.3
Cache River	20	30	270
Lost Creek Ditch	20	30	270
<u>Big Creek Ditch to Bayou De View</u>	<u>20</u>	<u>30</u>	<u>270</u>
Bayou DeView	20	30	270
Little Red River (including Greers Ferry Reservoir)	20	30	100
Black River	20	30	270
Strawberry River	20	30	270
Spring River	20	30	290
Eleven Point River	20	30	270
Stennitt Creek <u>from Brushy Creek to Spring</u> <u>River</u>	ER 17.3	ER 22.7	456*
South Fork Spring River	20	30	270
Myatt Creek	20	30	270
Current River	20	30	270
White River (Dam #3 to Missouri line, including Bull Shoals Reservoir)	20	20	180
Buffalo River	20	20	200
Crooked Creek	20	20	200
White River (Missouri line to headwaters, including Beaver Reservoir)	20	20	160
Kings River	20	20	150
West Fork White River	20	20	150
St. Francis River Basin			
St. Francis River (Mouth to 36° N. Lat.)	10	30	330
L'Anguille River	20	30	235
Tyronza River (headwaters to Ditch No. 6 confluence)	20	30	350
Ditch No. 27	ER 48	480	1200
Ditch No. 6 (mouth to Ditch No. 27 confluence)	ER 48	210	630
Tyronza River (mouth to Ditch No. 6 confluence)	20	60	350
Little River	20	30	365
Pemiscot Bayou	20	30	380
St. Francis River (36° N. Lat. to 36° 30' N. Lat.)	10	20	180
Ouachita River Basin			
Bayou Bartholomew	50 <u>30</u>	20 <u>30</u>	500 <u>220</u>
Chemin-A-Haut Creek	50	20	500
Overflow Creek	20	30	170
Bayou Macon	30	40	330

StreamConcentration-mg/L

	<u>Chloride</u> (Cl)	<u>Sulfate</u> (SO ₄ ⁻²)	<u>Total</u> <u>Dissolved</u> <u>Solids</u> (TDS)
Boeuf River	90	30	460
Big Cornie Creek	230	30	500
Little Cornie Creek	200	10	400
Three Creeks	250	10	500
Little Cornie Bayou	200	20	500
Unnamed trib from GLCC 003	538*	35*	519*
Unnamed trib to Little Cornie Bayou	305*	<u>ER 41.3</u>	325*
Little Cornie Bayou from unnamed trib to State Line	215*	25*	500*
Walker Branch	180*	<u>ER 41.3</u>	970*
Gum Creek	104*	<u>ER 41.3</u>	311*
Bayou de L'Outre above Gum Creek	250	90	500
Bayou de L'Outre below Gum Creek	250	90	750
Ouachita River (Louisiana line to Camden)	160	40	350
Saline River	20	40	120
Saline River east bifurcation at Holly Creek	<u>ER 18.7</u>	250	500
Hurricane Cr above Hurricane Lake Dam	20	250	500
Hurricane Cr from Hurricane Lk. Dam to Ben Ball			
<u>Brdg Bridge</u>	125	730	1210
Hurricane Cr from Ben Ball Bridge to Hwy.270	125	700	1200
Hurricane Cr from Hwy 270 to Saline River	100	500	1000
Alcoa unnamed tribs to Hurricane Cr.	125	700	1100
Dry Lost Creek and tribs	<u>ER 18.7</u>	560	880
Lost Creek to Little Lost Creek	<u>ER 18.7</u>	510	820
Lost Creek below Little Lost Creek	<u>ER 18.7</u>	300	550
Holly Creek	30	860	1600
Moro Creek	30	20	260
Smackover Creek	250	30	500
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	16*	80*	315*
EDCC 001 ditch to confluence with Flat Creek			
Confluence with unnamed trib A to Flat Creek	23*	125*	475*
Bayou de L'Outre Creek above Loutre Creek	180	<u>ER 41.3</u>	970
Unnamed trib UT004 from GLCC	014*	<u>ER 41.3</u>	311*
Unnamed trib UT002 from GLCC	278*	90*	500*

StreamConcentration-mg/L

	<u>Chloride</u> (Cl ⁻)	<u>Sulfate</u> (SO ₄ ⁻²)	<u>Total</u> <u>Dissolved</u> <u>Solids</u> (TDS)
Loutre Creek- from 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*
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 of Bear Creek to the Arkansas/Louisiana State Line	250*	171*	750*
Ouachita River (Camden to Carpenter Dam)	50	40	150
Town Creek below Acme trib.	ER <u>18.7</u>	200	700
Unnamed trib from Acme	ER <u>18.7</u>	330	830
Little Missouri River	10	90	180
Muddy Fork Little Missouri	ER <u>18.7</u>	250	500
Bluff Creek and unnamed trib.	ER <u>18.7</u>	651*	1033*
Garland Creek	250	250	500
South Fork Caddo	ER <u>15</u>	60	128
Back Valley Creek	ER <u>15</u>	250	500
Ouachita River (Carpenter Dam to Headwaters, including Lake Ouachita tributaries)	10	10	100

<u>Stream</u>	<u>Concentration-mg/L</u>		
	<u>Chloride</u> (Cl)	<u>Sulfate</u> (SO ₄ ⁻²)	<u>Total</u> <u>Dissolved</u> <u>Solids</u> (TDS)
Red River Basin			
Bayou Dorcheat	100	16*	250
Albemarle unnamed trib (AUT) to Horsehead Creek	137*	ER 41.3	383*
Horsehead Creek from AUT to mouth	85*	ER 41.3	260*
Cypress Creek	250	70	500
Crooked Creek	250	10	500
Dismukes Creek	26	ER 41.3	157
Big Creek from Dismukes to Bayou Dorcheat	20	ER 41.3	200
Bois d'Arc Creek from Caney Creek to Red River	113*	283*	420*
Caney Creek	113*	283*	420*
Bodcau Creek	250	70	500
Poston Bayou	120	40	500
Kelley Bayou	90	40	500
Red River from Oklahoma to confluence with Little River	250	200	850
Red River from Little River to Louisiana	250	200	500
Sulphur River	120	100	500
Days Creek	250	250	500
McKinney Bayou	180	60	480
Little River	20	20	100
Saline River	20	10	90
Mine Creek from Hwy 27 to Millwood Lake	90	65	700
Cossatot River	10	15	70
Upper Rolling Fork	20	20	100
Rolling Fork from unnamed trib A to DeQueen Lake	130	70	670
Unnamed tribs A and A1 at Grannis	135	70	700
Mountain Fork	20	20	110
Mississippi River (Louisiana line to Arkansas River)	60	150	425
Mississippi River (Arkansas River to Missouri line)	60	175	450

ER—ecoregion standard

* - based on critical background flow of 4 cfs

**—These limits shall apply to all tributaries of Bayou Meto and Bayou Two Prairie listed in Appendix A. Any modification of these values must be made in accordance with Reg. 2.306.

(B) Ecoregion Reference Stream Minerals Values

The following values determined from Arkansas' Arkansas's least-disturbed ecoregion reference streams are considered to be the

DESIGNATED USES: OZARK HIGHLANDS ECOREGION

(Plates OH-1, OH-2, OH-3, OH-4)

Extraordinary Resource Waters

Current River (OH-4)

Eleven Point River (OH-4)

Strawberry River (OH-3, OH-4)

Little Strawberry River (OH-3)

Spring River, including its tributaries: Field Creek, Big Creek, English Creek, Gut Creek, and Myatt Creek (OH-4)

South Fork Spring River (OH-3, OH-4)

North Sylamore Creek (OH-3)

Buffalo River (OH-2, OH-3)

Kings River (OH-2)

Bull Shoals Reservoir (OH-2, OH-3)

Natural and Scenic Waterways

Strawberry River from headwaters to Sharp-Izard County Line (OH-3, OH-4)

Kings River - segment in Madison County (OH-2)

Buffalo River (OH-2, OH-3)

North Sylamore Creek (OH-3)*

Ecologically Sensitive Waterbodies

Cave Springs Cave, Logan Cave, and nNumerous springs and spring-fed tributaries which support southern cavefish, Ozark cavefish, Arkansas darter, least darter, Oklahoma salamander, cave snails, cave crawfish, and unique invertebrates (OH-1, OH-2, OH-3)

Strawberry River - location of Strawberry River darter (OH-3, OH-4)

Little Strawberry River - location of Strawberry River darter (OH-3)

Spring River - snuffbox and pink mucket mussels; Ozark hellbender (OH-4)

Rock Creek - snuffbox and pink mucket mussels; Ozark hellbender (OH-4)

Eleven Point River - location of Ozark hellbender (OH-4)

Current River - location of flat floater and pink mucket mussels (OH-4)

Illinois River - Neosho mucket (OH-1)

Primary Contact Recreation - all streams with watersheds of greater than 10 mi² and all lakes/reservoirs**

Secondary Contact Recreation - all waters**

Domestic, Industrial and Agricultural Water Supply - all waters**

Fisheries Aquatic Life**

Trout

Bull Shoals Reservoir - lower portion (OH-2)

White River from Bull Shoals Dam to Dam #3 (OH-3)

North Fork White River (OH-3)

Spring River from Mammoth Springs to South Fork Spring River (OH-4)

Upper White River from Beaver Dam to State Line (OH-1)

Lakes and Reservoirs - all

Streams

Seasonal Ozark Highlands fishery aquatic life use - all streams with watersheds of less than 10 mi² except as otherwise provided in Reg. 2.505

Perennial Ozark Highlands fishery aquatic life use - all streams with watersheds of 10 mi² and larger and those waters where discharges equal or exceed 1 CFS cfs

*As designated in the National Wild and Scenic Rivers System

**Except for those waters with designated use variations supported by UAA or other investigations.

Designated Use Variations Supported by UAA or Other Investigations

- Railroad Hollow Creek - no fishable/swimmable uses (OH-1, #1)
- Columbia Hollow Creek - seasonal fishery ~~aquatic life use~~ March-June (OH-1, #2)
- Curia Creek below first waterfall - perennial fishery ~~aquatic life use~~ (OH-4, #3)
- Moccasin Creek below Highway 177 - perennial fishery ~~aquatic life use~~ (OH-3, #4)
- Stennitt Creek from Brushy Creek to Spring River - no domestic water supply use (OH-4, #6)

SPECIFIC STANDARDS: OZARK HIGHLANDS ECOREGION
(Plates OH-1, OH-2, OH-3, OH-4)

	<u>Streams</u>	<u>Lakes and Reservoirs</u>
Temperature °C (°F)*	29 (84.2)	32 (89.6)
Trout waters	20 (68)	
Turbidity (NTU) (base/all)	10/17	25/45
Minerals	see Reg. 2.511	see Reg. 2.511
Dissolved Oxygen**	<u>Pri.</u> <u>Crit</u>	see Reg. 2.505
<10 mi ² watershed	6 2	
10 to 100 mi ²	6 5	
>100 mi ² watershed	6 6	
Trout waters	6 6	

All other standards (same as statewide)

Specific Standards Variations Supported by UAA

- Railroad Hollow Creek from headwaters to Spavinaw Creek - dissolved oxygen ~~standard~~ 2 mg/l mg/L year-round (OH-1, #1)
- Curia Creek below first waterfall - critical season ~~D.O. dissolved oxygen standard~~ 6 mg/l mg/L (OH-4, #3)
- Moccasin Creek below Highway 177 - critical season ~~D.O. dissolved oxygen standard~~ 5 mg/l mg/L (OH-3, #4)
- SWEPCO Reservoir - maximum temperature 54°C (limitation of 2.8°C above natural temperature does not apply) (OH-1, #5)
- Stennitt Creek from Brushy Creek to Spring River - ~~TDS=~~ total dissolved solids 456 mg/l mg/L (OH-4, #6)

*Increase over natural temperatures may not be more than 2.8°C (5°F).

**At water temperatures ≤10°C or during March, April and May when stream flows are 15 ~~CFS~~ cfs and greater, the primary season ~~D.O. dissolved oxygen standard~~ will be 6.5 mg/l mg/L. When water temperatures exceed 22°C, the critical season ~~D.O. dissolved oxygen standard~~ may be depressed by 1 mg/l mg/L for no more than 8 hours during a 24-hour period.

DESIGNATED USES: BOSTON MOUNTAINS ECOREGION

(Plates BM-1, BM-2, BM-3)

Extraordinary Resource Waters

Devils Fork of Little Red River including Beech Creek, Tomahawk Creek, Turkey Creek, Lick Creek and Raccoon Creek (BM-3)

Middle Fork of Little Red River above Greers Ferry Reservoir (BM-2, BM-3)

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)

Archey Creek from headwaters to confluence with South Fork Little Red River (BM-2)

Illinois Bayou including North, Middle, and East Forks (BM-2)

Big Piney Creek (BM-2)

Hurricane Creek (BM-2)

Mulberry River (BM-1, BM-2)

Lee Creek from state line upstream to headwaters (BM-1)

Salado Creek (BM-3)

Kings River (BM-1)

Richland Creek and Falling Water Creek (BM-2)

Buffalo River (BM-1, BM-2)

Natural and Scenic Waterways

Mulberry River (BM-1, BM-2)

Buffalo River (BM-1, BM-2)

Kings River (BM-1)

Big Piney Creek (BM-2)*

Hurricane Creek (BM-2)*

Richland Creek (BM-2)*

Ecologically Sensitive Waterbodies

Devils, Middle, and South, and Forks Devils Forks of Little Red River including Beech Creek, Tomahawk Creek, Turkey Creek, Lick Creek, Raccoon Creek, Little Raccoon Creek, of Little Red River and Archey Creek above Greers Ferry Reservoir - location of endemic yellowcheek darter and endangered speckled pocketbook mussel (except Devils Fork) (BM-2, BM-3)

Foshee Cave - location of aquatic cave snail (BM-3)

Upper White River - location of longnose darter (BM-1)

Primary Contact Recreation - all streams with watersheds of greater than 10 mi² and all lakes/reservoirs**

Secondary Contact Recreation - all waters**

Domestic, Industrial and Agricultural Water Supply - all waters**

Fisheries Aquatic Life**

Trout

Greers Ferry Reservoir below Narrows (BM-3)

Little Red River below Greers Ferry Dam (BM-3)

Lakes and Reservoirs – all

*As designated in the National Wild and Scenic Rivers System

**Except for those waters with designated use variations supported by UAA or other investigations.

Streams

Seasonal Boston Mountain fishery aquatic life use - all waters with watersheds of less than 10 mi² except as otherwise provided in Reg.2.505
 Perennial Boston Mountain fishery aquatic life use - all waters with 10 mi² watershed or larger and those waters where discharges equal or exceed 1 CFS cfs

Designated Use Variations Supported by UAA

None

SPECIFIC STANDARDS: BOSTON MOUNTAINS ECOREGION
 (Plates BM-1, BM-2, BM-3)

	<u>Streams</u>	<u>Lakes and Reservoirs</u>
Temperature °C (°F)*	31 (87.8)	32 (89.6)
Trout waters	20 (68)	
Turbidity (NTU) (base/all)	10/19	25/45
Minerals	see Reg. 2.511	see Reg. 2.511
Dissolved Oxygen (mg/l <u>mg/L</u>)**	<u>Pri.</u> <u>Crit</u>	see Reg. 2.505
<10 mi ² watershed	6 2	
10 mi ² and greater	6 6	
Trout waters	6 6	
All other standards	(same as statewide)	

Specific Standards Variations Supported by UAA

None

*Increase over natural temperatures may not be more than 2.8°C (5°F).

**At water temperatures ≤10°C or during March, April and May when stream flows are 15 CFS cfs and greater, the primary season ~~D.O. dissolved oxygen~~ standard will be 6.5 ~~mg/l~~ mg/L. When water temperatures exceed 22°C, the critical season ~~D.O. dissolved oxygen~~ standard may be depressed by 1 ~~mg/l~~ mg/L for no more than 8 hours during a 24-hour period.

DESIGNATED USES: ARKANSAS RIVER VALLEY ECOREGION

(Plates ARV-1, ARV-2, ARV-3)

Extraordinary Resource Waters

Cadron Creek including North Fork and East Fork (ARV-2, ARV-3)

Mulberry River (ARV-1)

Big Creek adjacent to natural areas (ARV-3)

Natural and Scenic Waterway

Mulberry River (ARV-1)

Ecologically Sensitive Waterbodies

None

Primary Contact Recreation - all streams with watersheds of greater than 10 mi² and all lakes/reservoirs**

Secondary Contact Recreation - all waters**

Domestic, Industrial and Agricultural Water Supply - all waters**

Fisheries Aquatic Life**

Trout

Little Red River below Greers Ferry Dam to Searcy (ARV-3).

Lakes and Reservoirs - all

Streams

Seasonal Arkansas River Valley fishery aquatic life use - all streams with watersheds of less than 10 mi² except as otherwise provided in Reg. 2.505

Perennial Arkansas River Valley fishery aquatic life use - all streams with watersheds of 10 mi² or larger and those waters where discharges equal or exceed 1 CFS cfs

Designated Use Variations Supported by UAA

Poteau River from Business Highway 71 to Stateline - no domestic water supply use (ARV-1, #2)

Unnamed trib to Poteau River at Waldron - no domestic water supply use (ARV-1, #3)

**Except for those waters with designated use variations supported by UAA or other investigations.

DESIGNATED USES: OUACHITA MOUNTAIN ECOREGION
(Plates OM-1, OM-2)

Extraordinary Resource Waters

Lake Ouachita (OM-1, OM-2)

DeGray Reservoir (OM-2)

Saline River - entire segment including North, Alum, Middle, and South Forks (OM-2)

Caddo River - above DeGray Reservoir (OM-1, OM-2)

South Fork Caddo River (OM-1)

Cossatot River - above Gillham Reservoir (OM-1)

Caney Creek (OM-1)

Little Missouri River - above Lake Greeson (OM-1)

Mountain Fork River (OM-1)

Big Fork Creek - adjacent to natural area (OM-1)

Natural and Scenic Waterway

Cossatot River above Gillham Reservoir (OM-1)

Little Missouri River above Lake Greeson (OM-1)

Brushy Creek (OM-1)*

Ecologically Sensitive Waterbodies

Ouachita River above Lake Ouachita - location of Caddo madtom, longnose darter, peppered shiner and threatened Arkansas Fatmucket mussel (OM-1)

South Fork Ouachita River - location of Arkansas fatmucket mussel and Caddo madtom (OM-1)

Caddo River and all tributaries above DeGray Reservoir - location of endemic paleback darter, Caddo madtom and threatened Arkansas Fatmucket mussel (OM-1, OM-2)

Mountain Fork River - location of threatened leopard darter (OM-1)

Cossatot River above Gillham Reservoir - location of threatened leopard darter (OM-1)

Saline River including Alum, Middle, North, and South Forks, and Ten Mile Creek - location of endemic Ouachita madtom and threatened Arkansas Fatmucket mussel (except South Fork and Ten Mile Creek)(OM-2)

Little Missouri River above Lake Greeson - location of Caddo madtom

Mayberry Creek (trib to Hallman's Creek) - location of paleback darter (OM-2)

Robinson Creek - location of threatened leopard darter (OM-1)

Primary Contact Recreation - all streams with watersheds of greater than 10 mi² and all lakes/reservoirs**

Secondary Contact Recreation - all waters**

Domestic, Industrial and Agricultural Water Supply - all waters**

Fisheries Aquatic Life**

Trout

Lake Ouachita (lower portion) (OM-2)

Ouachita River from Blakely Mt. Dam to Hwy. 270 bridge (OM-2)

Lakes and Reservoirs – all

*As designated in the National Wild and Scenic Rivers System.

**Except for those waters with designated use variations supported by UAA or other investigations.

Fisheries Aquatic Life**

Streams

Seasonal Ouachita Mountain Ecoregion fishery ~~aquatic life use~~ - all streams with watersheds of less than 10 mi² except as otherwise provided in Reg. 2.505
 Perennial Ouachita Mountain Ecoregion fishery ~~aquatic life use~~ - all streams with watershed of 10 mi² or larger and those waters where discharges equal or exceed 1 CFS cfs

Designated Use Variations Supported by UAA

Rolling Fork from unnamed trib A at Grannis to DeQueen Reservoir - no domestic water supply use (OM-1, #2)
 Unnamed tributaries A and A1 at Grannis - no domestic water supply use (OM-1, #3)

SPECIFIC STANDARDS: OUACHITA MOUNTAIN ECOREGION
 (Plates OM-1, OM-2)

	<u>Streams</u>	<u>Lakes and Reservoirs</u>
Temperature °C (°F)* Trout waters	30 (86) 20 (68)	32 (89.6)
Turbidity (NTU) (base/all)	10/18	25/45
Minerals	see Reg. 2.511	see Reg. 2.511
Dissolved Oxygen (mg/l <u>mg/L</u>)**	<u>Pri.</u> <u>Crit</u>	see Reg. 2.505
<10 mi ² watershed	6 2	
10 mi ² and greater	6 6	
Trout waters	6 6	
All other standards	(same as statewide)	

Specific Standards Variations Supported by UAA

Prairie Creek from headwaters to confluence with Briar Creek - critical season dissolved oxygen standard 4 ~~mg/l~~ mg/L (OM-1, #1)
 Rolling Fork from unnamed trib A to DeQueen Reservoir - chlorides 130 ~~mg/l~~ mg/L; sulfates 70 ~~mg/l~~ mg/L; ~~TDS total dissolved solids~~ 670 ~~mg/l~~ mg/L (OM-1, #2)
 Unnamed tributaries A and A1 at Grannis - chlorides 135 ~~mg/l~~ mg/L; sulfates 70 ~~mg/l~~ mg/L; ~~TDS total dissolved solids~~ 700 ~~mg/l~~ mg/L (OM-1, #3)
 South Fork Caddo River - sulfates 60 ~~mg/l~~ mg/L (OM-1, #4)
 Back Valley Creek - sulfates 250 ~~mg/l~~ mg/L; total dissolved solids 500 ~~mg/l~~ mg/L (OM-1, #5)

*Increase over natural temperatures may not be more than 2.8°C (5°F).

**At water temperatures ≤10°C or during March, April and May when stream flows are 15 CFS cfs and greater, the primary season ~~D.O. dissolved oxygen~~ standard will be 6.5 ~~mg/l~~ mg/L. When water temperatures exceed 22°C, the critical season ~~D.O. dissolved oxygen~~ standard may be depressed by 1 ~~mg/l~~ mg/L for no more than 8 hours during a 24-hour period.

DESIGNATED USES: GULF COASTAL ECOREGION
(Plates GC-1, GC-2, GC-3, GC-4)

Extraordinary Resource Waters

Saline River (GC-3, GC-4)
Moro Creek - adjacent to natural area (GC-3)

Natural and Scenic Waterways

Saline River from the Grant-Saline County line to mouth (GC-3)

Ecologically Sensitive Waterbodies

Little River above Millwood Reservoir - location of Ouachita rock pocketbook and pink mucket mussels (GC-1)
Grassy Lake and Yellow Creek below Millwood Reservoir - unique ecosystem and biota (GC-1)
Lower Little Missouri River - location of peppered shiner and longnose darter (GC-2)
Lower Saline River - location of peppered shiner, crystal darter and goldstripe darter (GC-3)
Ouachita River near Arkadelphia - location of flat floater, Ouachita rock pocketbook and pink mucket mussels (GC-2)

Streams with Substantial Springwater Influence

L'Eau Frais (GC-4)
Cypress Creek (GC-4)
East and West Fork Tulip Creeks (GC-4)
Others to be determined

Primary Contact Recreation - all streams with watersheds greater than 10 mi² and all lakes/reservoirs**

Secondary Contact Recreation - all waters**

Domestic, Industrial and Agricultural Water Supply - all waters**

Fisheries Aquatic Life**

Trout

Little Missouri River from Narrows Dam to confluence with Muddy Fork (GC-1)

Lakes and Reservoirs - all

Streams

Seasonal Gulf Coastal fishery ~~aquatic life use~~ - all streams with watersheds of less than 10 mi² except as otherwise provided in Reg. 2.505
Perennial Gulf Coastal fishery ~~aquatic life use~~ - all streams with watersheds of 10 mi² or larger and those waters where discharges equal or exceed 1-CFS ~~cfs~~

**Except for those waters with designated use variations supported by UAA or other investigations.

Designated Use Variations Supported by UAA

- Loufre Creek - perennial fishery aquatic life use, except seasonal from railroad bridge to mouth (GC-2, #1)
Unnamed trib to Smackover Creek - no fishable/swimmable uses (GC-2, #2)
Unnamed trib to Flat Creek - no fishable/swimmable uses (GC-2, #4)
Dodson Creek - perennial fishery aquatic life use (GC-4, #5)
Jug Creek - perennial fishery aquatic life use (GC-2, #6)
Lick Creek - seasonal fishery aquatic life use; no primary contact (GC-1, #7)
Coffee Creek and Mossy Lake - no fishable/swimmable or domestic water supply uses (GC-3, #8)
Red River from Oklahoma to confluence with Little River - no domestic water supply use (GC-1, #9)
Bluff Creek and unnamed trib - no domestic water supply use (GC-1, #10)
Mine Creek from Highway 27 to Millwood Lake - no domestic water supply use (GC-1, #11)
Caney Creek - no domestic or industrial water supply use (GC-1, #12)
Bois d'Arc Creek from Caney Creek to Red River - no domestic or industrial water supply use (GC-1, #13)
Town Creek below Acme trib - no domestic water supply (GC-4, #14)
Unnamed trib from Acme - no domestic water supply (GC-4, #14)
Gum Creek - no domestic water supply use (GC-2, #15)
Loufre creek from Highway 15 S. to the confluence of Bayou de Loufre – no domestic water supply use (GC-2, #41)
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)
Bayou de Loufre from ~~Gum Creek~~ mouth of UT004 to State line - no domestic water supply use (GC-2, #16)
Walker Branch - no domestic water supply use (GC-2, #17)
Little Cornie Bayou from Walker Branch to State line - no domestic water supply use (GC-2, #18)
Unnamed trib to Little Cornie Bayou (UTLCB-2) - no domestic water supply use (GC-2, #18)
Alcoa unnamed trib to Hurricane Creek and Hurricane Creek - no domestic water supply use (GC-4, #19)
Holly Creek - no domestic water supply use (GC-4, #20)
Dry Lost Creek and tribs - no domestic water supply use (GC-4, #21)
Lost Creek - no domestic water supply use (GC-4, #22)
Albemarle unnamed trib (AUT) to Horsehead Creek - no domestic water supply use (GC-2, #27)
Horsehead Creek from AUT to mouth - no domestic water supply use (GC-2, #27)
Dismukes Creek and Big Creek to Bayou Dorcheat - no domestic water supply (GC-2, #28)
Boggy Creek from the discharge from Clean Harbors El Dorado LCC downstream to the confluence of Bayou de Loufre - no domestic water supply use (GC-2, #51)
Unnamed trib to Flat Creek (UTA) - no domestic water supply use (GC-2, #38)
Unnamed trib to Flat Creek (UTB) - no domestic water supply use (GC-2, #37)
Flat Creek from the mouth of unnamed trib to the mouth of Haynes Creek - no domestic water supply use (GC-2, #39)
Haynes Creek from the confluence of Flat and Salt Creeks downstream to its confluence with Smackover Creek – no domestic water supply use (GC-2, #40)

DESIGNATED USES: DELTA ECOREGION

(Plates D-1, D-2, D-3, D-4, D-5)

Extraordinary Resource Waters

Second Creek (D-4)
Cache River above Cache Bayou - adjacent to natural areas (D-3)
Arkansas River below Dam #2 (D-5)
Strawberry River (D-1)
Two Prairie Bayou adjacent to natural areas (D-3)

Natural and Scenic Waterways

None

Ecologically Sensitive Waterbodies

Lower St. Francis River and lower 10 miles of Straight Slough - location of fat pocketbook mussel (D-2, D-4)
Right Hand Chute at confluence with St. Francis River - location of fat pocketbook mussel (D-2)
Depatee Creek - location of flat floater mussel (D-1)
Black River at mouth of Spring River - location of pink mucket mussel (D-1)

Channel-altered Delta Ecoregion Streams - These include the majority of the streams in this ecoregion and are characterized by substantial alteration of the morphology of their main-stream channel as well as their tributary streams. Such alteration of the tributaries of these streams significantly affects the water quality and hydrology of the streams and their watersheds. Most of the upper segments of these waters have been dredged and straightened into ditches. Additionally, most of the tributaries of these streams have been straightened, ditched and, in some cases, rerouted to quickly move water off the agriculture fields and into the major streams. In the lower segments of these waters, channel realignment is less expansive but most of these channels have been "snagged" to remove any in-stream obstructions (brush, logs, and other debris) and the stream channel and banks have been dredged to uniform depths and cleared of any obstructions. These include Cache River, Bayou DeView, Village Creek, Blackfish Bayou and others to be determined by the Arkansas Department of Environmental Quality on a case by case basis.

Primary Contact Recreation - all streams with watersheds of greater than 10 mi² and all lakes/reservoirs**

Secondary Contact Recreation - all waters**

Domestic, Industrial and Agricultural Water Supply - all waters**

Fisheries Aquatic Life**

Trout - none

Lakes and Reservoirs - all

Streams

Seasonal Delta fishery ~~aquatic life use~~ - all streams with watersheds of less than 10 mi² except as otherwise provided in Reg. 2.505
Perennial Delta fishery ~~aquatic life use~~ - all streams with watersheds 10 mi² or larger and those waters where discharges equal or exceed 1 CFS cfs

Designated Use Variation Supported by UAA

Unnamed ditch to Little Lagrue Bayou - perennial Delta fishery ~~aquatic life use~~ (D-3, #1)
Little Lake Bayou - seasonal Delta fishery ~~aquatic life use~~; no primary contact (D-5, #2)
Coon Creek and unnamed trib from Frit Ind. - no domestic water supply use (D-1, #3)
Rocky Branch Creek and Bayou Meto from Rocky Branch Creek to Bayou Two Prairie - no domestic water supply use (D-3, #4)
Ditch No. 27 - no domestic water supply use (D-2, #5)