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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
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DALLAS, TX 75202-2733

DEC 21 2004

Martin Maner, P.E.
Chief, Water Division
Arkansas Department of Environmental Quality
P.O. Box 8913
Little Rock, AR 72219-8913

Dear Mr. Maner:

The Environmental Protection Agency (EPA) has completed its review of Regulation No. 2, *Regulation Establishing Water Quality Standards for Surface Waters of the State of Arkansas*. I would like to acknowledge the efforts of the Arkansas Pollution Control and Ecology Commission, and particularly the Arkansas Department of Environmental Quality, in the development of these revised standards. The State's efforts to inform and involve the citizens of Arkansas in the water quality standards process should be commended.

EPA's review consisted of the triennial revisions which were adopted by the Commission on April 23, 2004. These water quality standards were submitted and received by EPA on November 2, 2004, as required under federal regulations at 40 CFR 131.5, along with an attorney's statement certifying that the revised water quality standards were duly adopted pursuant to the laws of the State of Arkansas. The revised standards became effective as State law on May 17, 2004.

I am pleased to inform you that in today's action, EPA is approving the majority of the new and revised elements of these standards pursuant to Section 303(c) of the Clean Water Act (CWA) and the implementing regulation at 40 CFR Part 131. However, we are unable to take action on the final sentence of the first paragraph under Regulation 2.509-Nutrients at this time. It is EPA's understanding that the Department is currently working towards the development of an assessment methodology for nutrients as referenced in this provision, and that this methodology is not yet available. EPA supports the efforts of the State in this endeavor, and will move to approve this sentence once an assessment methodology for nutrients has been developed by the State. We would appreciate development of an assessment methodology for nutrients in a timely manner, so as to remove this item from our backlog. A detailed explanation of the basis for EPA's approval decision and rationale for taking no action on the sentence in the nutrient provision is enclosed.

Section 7(a)(2) of the Endangered Species Act (ESA) requires that federal agencies, in consultation with the U.S. Fish and Wildlife Service (USFWS), insure that their actions are not likely to jeopardize the existence of federally-listed species or result in the adverse modification of designated critical habitat of such species. EPA initiated consultation with the USFWS under section 7(a)(2) of the ESA on this triennial revision on December 1, 2003. As of today, this consultation has not been completed, however, EPA Region 6 and USFWS have tentatively

agreed that these revisions are not likely to adversely affect any listed threatened and endangered species. Pending conclusion of that consultation, this approval is subject to the requirements in section 7(d) of the ESA. Additionally, EPA is approving Arkansas' new provision for ammonia found in Regulation 2.512, subject to the results of the national 304(a) consultations under section 7(d) of the ESA. By approving the standards "subject to the results of consultation under section 7(a)(2) of the Endangered Species Act," EPA has explicitly stated that it retains its discretion to take appropriate action if the consultation identifies deficiencies in the standards requiring remedial action by EPA, including any specific alternatives related to the ammonia criteria that may be determined as part of the national consultation. EPA retains the full range of options available under section 303(c) for ensuring water quality standards are environmentally protective.

Again, I would like to commend the Commission and the Arkansas Department of Environmental Quality for its commitment and hard work in completing this task of reviewing and revising the State's water quality standards. I look forward to working with you during the next triennial review. If you have any questions or concerns, please contact me at (214) 665-7101, or have your staff contact Melinda Nickason at (214) 665-8059.

Sincerely,

Sharon Fancy Parrish

for Miguel I. Flores
Director
Water Quality Protection Division

Enclosure

cc: Donna Davis, Office of Science and Technology
Allan Mueller, U.S. Fish and Wildlife Service

RECORD OF DECISION:

APPROVAL OF REGULATION NO. 2: *REGULATION ESTABLISHING WATER QUALITY STANDARDS FOR SURFACE WATERS OF THE STATE OF ARKANSAS*

U.S. EPA REGION 6
WATER QUALITY PROTECTION DIVISION
December 2004

Table of Contents

I. Introduction

A. Purpose

The purpose of this Record of Decision is to provide the basis and supporting information for the Environmental Protection Agency's (EPA, or "the Region") approval of Regulation No. 2: *Regulation Establishing Water Quality Standards for Surface Waters of the State of Arkansas*, as well as it's determination to take no action on the final sentence of the first paragraph in Regulation 2.509-Nutrients. Regulation No. 2 was submitted by the Arkansas Department of Environmental Quality (ADEQ, or "the Department") and received by EPA Region 6 on November 2, 2004. As described in §303(c) of the Clean Water Act (CWA) and in the Standards Regulation at 40 CFR Part 131, States and authorized Tribes have primary responsibility to develop and adopt water quality standards to protect their waters. State and Tribal water quality standards consist of three primary components: beneficial uses, criteria to support those uses, and an antidegradation policy. In addition, CWA §303(c) and 40 CFR Part 131.20 require States to hold public hearings at least once every three years to review and, as appropriate, modify and adopt standards. The EPA reviews new and revised surface water quality standards that have been adopted by States and authorized Tribes. Authority to approve or disapprove new and/or revised standards submitted to EPA for review has been delegated to the Water Quality Protection Division Director in Region 6. Tribal or State water quality standards are not considered effective under the CWA until approved by EPA.

B. Chronology of Events

October 4, 2001 to November 6, 2001 - ADEQ held a series of six public informational meetings at different locations in Arkansas to discuss its review of Regulation No. 2, *Regulation Establishing Water Quality Standards for Surface Waters of the State of Arkansas*.

July 30, 2002 - The first of seven meetings of the Water Quality Standards Workgroup to review a working draft of proposed changes to the State's water quality standards was held in Little Rock, Arkansas.

October 10, 2003 - ADEQ filed a Petition with the Arkansas Pollution Control and Ecology Commission (APC&EC) to Amend Regulation No. 2.

October 24, 2003 - The APC&EC's Regulations Committee met to review the Petition and recommended that the Commission institute a rule-making proceeding to consider adopting the proposed revisions to Regulation No. 2.

November 2, 2003 - Public notice of the proposed rule-making was published.

December 18, 2003 - Meeting at EPA Region 6, Dallas, Texas, between ADEQ and EPA Region 6 to discuss proposed changes to Regulation No. 2

January 5, 2004 to January 22, 2004 - APC&EC held six hearings to receive public comments on proposed changes to Regulation No. 2

January 28, 2004 - Meeting at ADEQ, Little Rock, Arkansas, between ADEQ, EPA Region 6, and USFWS-Conway Field Office to discuss proposed changes to Regulation No. 2.

February 5, 2004 - EPA Region 6 submitted comments to ADEQ on the proposed changes to Regulation No. 2.

February 5, 2004 - Public comment period ended on the proposed changes to Regulation No. 2.

April 16, 2004 - EPA received a letter from Martin Maner, Water Division Chief, ADEQ, transmitting the "Responsiveness Summary to Comments received from the Public Concerning Proposed Changes to Regulation No. 2."

April 23, 2004 - Marcus Devine, Director, APC&EC signed a minute order adopting changes to Regulation No. 2.

November 2, 2004 - ADEQ submitted Regulation No. 2 to EPA Region 6.

II. New or Revised Provisions EPA is Approving

The Environmental Protection Agency (EPA) has determined that the new or revised provisions in Arkansas' Regulation No. 2 described below are approvable.

A. Table of Contents

The abbreviation "Reg." has replaced the word "Section" throughout the Table of Contents and throughout the subtitles in Regulation No. 2.

The subtitle Reg. 2.405 has been revised from "Reserved" to read "Biological Integrity."

The previously omitted subtitle Reg. 2.507 - Bacteria has now been added into the Table of Contents.

A new subtitle for Reg. 2.512 - Ammonia has been added to the Table of Contents.

Action: EPA approves these revisions to the Table of Contents.

B. Chapter 1: Authority, General Principles, and Coverage

Regulation 2.105 - Environmental Improvement Projects

Language was added to this provision which references the State law that provides for long-term environmental improvement projects. Addition of the reference provides clarification in the standards and does not alter the implementation of the provision on environmental improvement projects.

Action: EPA approves the revised provision.

Regulation 2.106 - Definitions

"Commission"

This is a new definition which was provided so that the simplified name "Commission" could be used in place of the name "Arkansas Pollution Control and Ecology Commission."

"Department"

This is a new definition which was provided so that the simplified name "Department" could be used in place of the name "Arkansas Department of Environmental Quality."

"Impairment"

This definition was added to increase clarity as to the meaning of "impairment" in the standards document.

"Natural background"

In a letter dated May 17, 2001, EPA disapproved a provision in Section 2.501-Applicability of Arkansas' surface water quality standards which was submitted to EPA on January 23, 1998. The provision allowed for occasional exceedances of criteria due to "naturally occurring excursions." However, since this provision would not ensure that these excursions would be due to non-anthropogenic events only and did not make the differentiation between point and nonpoint sources in the cause of such an excursion, EPA disapproved the provision. In order to correct this disapproval, a new definition was added for "naturally occurring excursions" which included the term "natural background."

The new "natural background" definition serves to clarify what is meant by "natural background." The definition of "natural background" is consistent with EPA's recommendations.

"Naturally occurring excursions"

In a letter dated May 17, 2001, EPA disapproved a provision in Section 2.501-Applicability of Arkansas' surface water quality standards which was submitted to EPA on January 23, 1998. The provision allowed for occasional exceedances of criteria due to "naturally occurring excursions." However, since this provision would not ensure that these excursions would be due to non-anthropogenic events only, and since it did not make the differentiation between point and nonpoint sources in the cause of such an excursion, EPA disapproved the provision. In order to correct this disapproval action, a new definition was added for "naturally occurring excursions" in order to ensure that any occasional exceedances of criteria would only be considered to be naturally occurring if they are only a temporary deviation from natural background caused by natural events. The definition of "naturally occurring excursions" is consistent with EPA's recommendations.

"Objectionable algal densities"

The phrase "expressed as cells per liter" has been deleted from the definition. The revised nutrient narrative in Regulation 2.509 states that "materials stimulating algal growth shall not be present in concentrations sufficient to cause objectionable algal densities..." Regulation 2.106 previously defined objectionable algal densities as the "number of total algae which would interfere with a beneficial use (expressed as cells per liter)." This previous definition was not consistent with the revised nutrient narrative criteria. According to the nutrient narrative, many factors can determine if objectionable algal densities are present, and a threshold number of cells per liter is not identified. Inclusion of the phrase "expressed as cells per liter" implied a fixed number, and a fixed number is not part of the revised nutrient narrative standard. Furthermore, measurement of periphyton, or attached algae, is not expressed as "cells per liter."

Action: EPA approves these new and revised definitions.

C. Chapter 2: Antidegradation Policy

Regulation 2.203 - Outstanding Resource Waters

Language in this provision was modified in order to clarify the intent of the Outstanding Resource Water designation. Protection of Outstanding Resource Waters through land management practices protective of the watershed is encouraged. The Clean Water Act does not establish a federally-enforceable

program for nonpoint sources. Control of non-point source pollution, not currently regulated by an existing permit, should be a voluntary action. Therefore, the word "pursuit" was modified to the word "encouragement" in order to clarify this point.

In addition, a sentence was added to this provision which states that "It is not the intent of the ERW designated use definition to imply that ERW status dictates regulatory authority over private land within the watershed, other than what exists under local, state, or federal law." Public concern arose regarding the phrase "and its watershed" found in the Extraordinary Resource Water (ERW) definition in Regulation 2.302 (A). There was concern that use of the word "watershed" extended the ERW designation to control all of the private property within the watershed of a waterbody designated as an ERW. Furthermore, there was concern that the water quality regulation for ERWs potentially regulated all land surface activities which have surface runoff within the ERW watershed. The purpose for the inclusion of this sentence into Regulation 2.203 was to clarify the intent of the ERW designated use definition found in Regulation 2.302 (A).

Action: EPA approves the revised provision.

D. Chapter 3: Waterbody Uses

Regulation 2.302 - Designated Uses

(F)(3)(a) Ozark Highlands Ecoregion

Two new fish species, the bleeding shiner (*Luxilus zonatus*) and the cardinal shiner (*Luxilus cardinalus*), were added to the list of key species.

(F)(3)(e) Typical Gulf Coastal Ecoregion

In this provision, two fish species were interchanged so that the warmouth (*Lepomis gulosus*) is identified as a key species, while the flier (*Centrarchus macropterus*) is identified as an indicator species.

Action: EPA approves the revised provisions.

Regulation 2.305 - Short Term Activity Authorization

Since the Arkansas Department of Pollution Control and Ecology (ADPC&E) was renamed the Arkansas Department of Environmental Quality (ADEQ), the words "of the Department of Pollution Control and Ecology" were deleted.

Action: EPA approves the revised provision.

Regulation 2.306 - Procedures for Removal of Any Designated Use Except Fishable/Swimmable, and Modification of Water Quality Criteria not Related to Fishable/Swimmable Uses

This provision provides the procedure to be used for removing a use that is not a CWA 101(a)(2) use or for modifying water quality criteria not related to CWA 101(a)(2) uses. New language has been added to this provision to allow for the reevaluation of such use removals or criteria modifications in order to determine if reestablishment of the more stringent water quality criteria or the removed use is warranted based upon the availability of treatment options which are made more practicable through changing community water needs and technological advancement. This new language does not allow the removal of CWA 101(a)(2) uses. The reevaluation provided for in this new language is supported by 40 CFR 131.20 which requires States to review and revise water quality standards from time to time, but at least once every three years.

Action: EPA approves the revised provision.

E. Chapter 4: General Standards

Regulation 2.404 - Mixing Zones

In the first sentence of this regulation the phrase "this subsection" was revised to read "Reg. 2.404." This revision does not alter the meaning of Regulation 2.404.

The phrase "of Pollution Control and Ecology" was deleted. The name "Department" remains and provides a simpler way of stating which agency is responsible for determining the size of mixing zones in lakes and reservoirs. Department is defined in Regulation 2.106 as the Arkansas Department of Environmental Quality.

Action: EPA approves these revisions to Regulation 2.404.

Regulation 2.405 - Biological Integrity

An entirely new provision entitled "Biological Integrity" has been added to Arkansas' Surface Water Quality Standards as Regulation 2.405. The Water Division staff of ADEQ considered EPA guidance documents, input from stake holders, and information from other sources to include "Biological Integrity" as an assessment tool to further assess for use impairments. The new narrative biological provision is a very important improvement of the water quality

standards to address the protection of water quality to support biological communities. Inclusion of this provision into Arkansas' Surface Water Quality Standards supports the Clean Water Act's goals to provide for the protection and propagation of fish, shellfish, and wildlife and to restore and to maintain the chemical, physical, and *biological* integrity of the nation's waters.

The narrative biological criteria provided in this provision is an important first step in developing water quality criteria to protect the biological integrity of surface waters in Arkansas. EPA's *Biological Criteria: National Program Guidance for Surface Waters*[1] explains that States can establish general narrative biological criteria early in program development without conducting biological assessments. Once established in State standards, narrative biological criteria form the legal and programmatic basis for expanding biological assessment and biosurvey programs needed to implement narrative criteria and develop numerical biological criteria.

The State of Arkansas is currently developing and refining the methodology to be used in implementing this narrative standard. The February 1999 (EPA approved) State Continuing Planning Process (CPP), as well as the updated 2000 State CPP, provides a discussion on how the State currently implements its goal to protect the biological integrity of the waters of the State. Regulation 2.302(F) of the State's water quality standards describes the aquatic life community (through the identification of key and indicator species) expected to be present based upon waterbody type and ecoregion. Using this information in the standards, along with biological sampling techniques directed toward the study of macroinvertebrate and fish communities, the State is able to assess the status and trends occurring within the biological communities in waters of the State, and is also able to determine whether or not aquatic life uses are being supported. The State's CPP explains that analysis of macroinvertebrate community structure follows those procedures set out in EPA's 1989 *Rapid Bioassessment Protocols*.[2] (As the State may already be aware, this document was revised in 1999. EPA will provide a hard copy of this newer version to ADEQ.) Evaluations of fish community structure are based upon multi-metric analyses. In the State's 2000 CPP, it is stated that ADEQ is utilizing data from ecoregion-based reference

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[1]USEPA. 1990. *Biological Criteria: National Program Guidance for Surface Waters*. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. EPA 440/5-90-004.

[2]USEPA. 1989. *Rapid Bioassessment Protocols for Use in Streams and Rivers: Benthic Macroinvertebrates and Fish.* U.S. Environmental Protection Agency, Office of Water, Washington, D.C. EPA/444/4-89/001. (Most recent version: *Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers: Periphyton, Benthic Macroinvertebrates, and Fish.* EPA 841-B-99-002.)

streams to delineate the scoring ranges for each of the metrics, and that the information will be continually updated as additional reference stream data are developed.

Action: EPA approves the new provision. [*See further discussion concerning biological criteria in* **Comments** section below].

F. Chapter 5: Specific Standards

Regulation 2.503 - Turbidity

Previously, Regulation No.2 provided turbidity criteria (primary values) for specific ecoregions and large rivers which were applicable to the effect point source discharges might have on stream turbidity. Additional criteria (storm-flow values) were added to this provision for the same ecoregions and large rivers. These storm-flow values are applicable to the effect of naturally occurring storm events on stream turbidity. Previous assessment methodology used by the State has applied the primary values during the critical season (May 1 through September 30) and has applied storm-flow turbidity values year-round.

The primary turbidity criteria were established from stream base-flow data and do not reflect the more typical turbidity values found during regularly occurring storm events. The purpose for including these new storm-flow turbidity values was to recognize the naturally occurring increase in turbidity after a storm event. ADEQ has stated that the storm-flow values reflect the turbidity levels that are met near 90% of the time in long-term databases, including turbidity levels present during common storm events. These storm-flow values would not be expected to be exceeded during most storm events, and as such, would be appropriate as in-stream criteria to be used in assessing impacts resulting from increased turbidity values following common, high-frequency storm events.

EPA considers the new storm-flow turbidity values to be approvable, because they are intended to reflect the natural increase in turbidity from nonpoint source runoff that occurs following a storm event. The CWA does not establish a federally-enforceable program for nonpoint sources, but it clearly intends that the best management practices developed under the Act be aggressively implemented by the states.

Action: EPA approves the modified provision. [*See further discussion concerning the turbidity provision in* **Comments** section below].

Regulation 2.507 - Bacteria

Several modifications were made to the bacteria provision found in Regulation 2.507. First, language was deleted which provided for the year-round protection of primary contact in all waterbodies designated as Extraordinary Resource Waters (ERWs) and Natural and Scenic Waters (NSWs). The deleted language had previously provided fecal coliform criteria to protect primary contact recreation in all ERWs and NSWs. However, not all ERWs and NSWs in Arkansas are designated for primary contact use. Under Regulation 2.302 and Appendix A, only streams with watersheds greater than 10 mi^2 and lakes and reservoirs are designated for primary contact recreation use. Streams with watersheds less than 10 mi^2 are designated for secondary contact recreation, unless site verification shows that primary contact recreation should be designated. Therefore, the language (which has been deleted) was not consistent with the use designations presented in the water quality standards. Removal of this language allows for consistency between the use designations (primary or secondary contact recreation) and the type of criteria to be applied to ERWs and NSWs. For those ERWs and NSWs actually designated for primary contact, protection of these waterbodies for primary contact recreation will continue during the primary contact season (May to September) as provided in subsection A of Regulation 2.507. An additional effect of deleting this language is that protection for primary contact in ERWs and NSWs will no longer be provided year round. Removal of year round protection of primary contact recreation is justifiable because water temperatures between the months of October and April are characteristically too cool for voluntary full-body contact and these temperatures greatly shorten involuntary full-body contact.

Second, the primary contact season was originally designated to occur between April 1 and September 30, but the dates designated for the primary contact season have been modified to include the time period from May 1 to September 30. Water temperatures in April are characteristically too cool for voluntary full-body contact and these temperatures greatly shorten involuntary full-body contact. Shortening of the primary contact season was based on an examination of water temperature and the corresponding time when primary contact is prevalent by the majority of the users.

Third, for the original fecal coliform criteria, a single sample maximum value of 400 col/100 ml and 2000 col/100 ml was established for primary and secondary contact waters, respectively. An exceedance of these values in no more than 10% of the samples collected over any 30-day period was considered acceptable for meeting the water quality standards for bacteria. In the new changes made to this provision, the language discussing a less than 10% allowable exceedance was changed to reflect a monthly maximum value which shall not be

exceeded in both primary and secondary contact waters. Since the values themselves remained unaltered, the final effect of these language modifications were to change the allowable exceedance from less than 10% of samples collected to not a single sample being allowed to exceed the fecal coliform criteria (400 col/100 ml for primary contact waters and 2000 col/100 ml for secondary contact waters). Because these language changes provide for more stringent exceedance limits for fecal coliform concentrations in primary and secondary contact waters, EPA considers these changes to be approvable.

A fourth modification made to the bacteria provision provided in Regulation 2.507, was the inclusion of the 1986 criteria for *Escherichia coli.* The Water Division staff of ADEQ, using EPA guidance and input from various stakeholders and the public, made the decision to add the use of *E. coli* as a more accurate indicator of fecal contamination from warm-blooded animals. EPA is very supportive of the inclusion of *E. coli* criteria in the State's water quality standards. A stronger correlation has been found between *E. coli* or *enterococci* bacteria and gastrointestinal illness than between fecal coliform bacteria and gastrointestinal illness. Comparative testing of these two indicators in waters in Arkansas indicates that there is normally about a 1.5-2.0 to 1 relationship between fecal coliform and *E. coli* and that there seems to be less false positives with *E. coli*. As a result, *E. coli* appears to be a more accurate assessment tool.

For primary contact waters, the bacteria provision has been revised to include criteria for *E. coli,* which provides a geometric mean of 126 col/100 ml which shall not be exceeded. This geometric mean was recommended in EPA's *1986 Ambient Water Quality Criteria for Bacteria.*[3] The new *E. coli* criteria also provides a monthly maximum value of 298 col/100 ml in lakes, reservoirs, and ERWs. This criterion was based upon EPA's 1986 recommendation for moderate full body contact recreation (with an 82 % confidence level). A monthly maximum value of 410 col/100 ml was established for other rivers and streams designated for primary contact recreational use. This monthly maximum value is very close to EPA's recommended *E. coli* criterion of 406 col/100 ml for waters that are lightly used for full body contact recreation (with a 90 % confidence level).

EPA's May 2002 draft *Implementation Guidance for Ambient Water Quality Criteria for Bacteria*[4] states that "despite the lack of information necessary to develop a risk-based secondary contact recreation criterion, EPA

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[3]USEPA. 1986. *Ambient Water Quality Criteria for Bacteria.* U.S. Environmental Protection Agency, Office of Water, Washington, D.C. EPA 440/5-84-002.

[4]USEPA. 2002. Draft: *Implementation Guidance for Ambient Water Quality Criteria for Bacteria.* U.S. Environmental Protection Agency, Office of Water, Washington, D.C. EPA 823-B-02-003.

believes that waters designated for secondary contact recreation should also have in place an accompanying numeric criterion." As has been the practice for developing secondary contact recreation criteria for fecal coliforms in the past, the draft guidance provides the recommendation that States adopt a secondary contact recreation criterion for *E. coli* that is five times the geometric mean establish for primary contact recreation. The newly established *E. coli* criterion for secondary contact recreation provides a geometric mean of 630 col/100 ml that is not to be exceeded. This value is five times the geometric mean established for primary contact recreation. Both monthly maximum criteria established to protect secondary contact recreation (1490 col/100 ml for lakes, reservoirs, and ERWs; and, 2050 col/100 ml for other rivers and streams) are five times the monthly maximum values for *E. coli* concentrations established to protect primary contact recreation uses.

A fifth change to the bacteria provision found at Regulation 2.507 is the addition of a paragraph (subsection C) which describes the assessment protocol used to determine if the primary or secondary contact uses in ambient waters are being impaired by bacteria. The paragraph states that: "For assessment of ambient waters as impaired by bacteria, the above listed applicable values shall not be exceeded in more than 25% of samples in no less than eight (8) samples taken during the primary contact season or during the secondary contact season."

Water Division staff at ADEQ have stated that subsections (A) and (B) of Regulation 2.507 will be used for determining National Pollutant Discharge Elimination System (NPDES) permits, but only using fecal coliform. Subsection (C) will be used to determine impairment, using *E. coli*. *E. coli* is a more appropriate indicator organism for fecal contamination of surface waters, since some soil bacteria test positive as fecal coliform. Additionally, fecal coliform are appropriate for relevant NPDES permits (such as from POTW's), since their discharge is from treated wastewater. Water Division staff at ADEQ have also stated that the Department will not consider the geometric mean for assessing surface water quality, and that the geometric mean will only be used to determine compliance with NPDES permit limits for fecal coliform.

National EPA guidance has been issued concerning the assessment of contact recreation use impairment by bacteria. This guidance was titled *Guidelines for Preparation of the Comprehensive State Water Quality Assessments (305(b) Reports)*.[5] According to this guidance, fecal coliform criteria exceedances of greater than ten percent for a particular waterbody put that

[5]USEPA. 1997. *Guidelines for Preparation of the Comprehensive State Water Quality Assessments (305(b) Reports)*. U.S. Environmental Protection Agency, Assessment and Watershed Protection Division, Washington, D.C. EPA 841-B-97-002A and B.

waterbody into the "partially meeting uses" category. However, concerns were raised regarding this assessment protocol in two State/EPA Bacteria Workgroup meetings held in February 1997 and November1997. The workgroup felt that the percentages of exceedances listed in the guidance were arbitrary for bacteria and did not relate to the actual risk of contracting gastrointestinal disease. In partial response to the concerns of the workgroup, EPA Region 6 exercised its option to revise Section 3.3.2 Bacteria of the national 305 (b) guidance. In this revision, Region 6 no longer considered the "partial use support" a valid assessment and accepted less than 25 percent of samples exceeding State approved criteria (instead of ten percent) as the determining factor for a 305(b) assessment of attaining primary contact recreational use. Since no further guidance as been issued from EPA on whether or not assessment at the 25 percent level for *E. coli* bacteria levels is also acceptable, EPA considers the assessment at 25 percent of samples as provided for in subsection C of Regulation 2.507 to be approvable for assessment of both fecal coliform and *E. coli.*

Finally, a sentence has been deleted in the second paragraph of Regulation 2.507 which states that "The determination of mean fecal coliform levels for the following waters shall be based on a minimum of not less than five samples taken over not more than a 30-day period." In an April 21, 1997, letter from EPA Region 6 to the five states within the Region, EPA Region 6 stated that is was willing to consider other options that were discussed at the State/EPA Bacteria Workgroup meeting including the option of changing the five samples within 30-days requirement for bacteria. In determining whether or not assessment of contact recreational use impairment by bacteria based upon eight samples collected during the primary contact season or the secondary contact season is an acceptable alternative to the five samples within 30-days requirement, EPA examined the State of Arkansas' *2002 Integrated Water Quality Monitoring and Assessment Report*[6] to determine how sites in Arkansas are currently monitored for bacteria.

According to the State's report, under ADEQ's Bacteriological Program, monthly monitored sites which are part of the State's ambient monitoring program are sampled for bacteria on a rotating basis, resulting in approximately eight samples per site per year during the swimming season. The quarterly and bimonthly monitoring of previously unassessed waters which are part of the "Roving Monitoring Network" in the State includes bacteriological analyses at all sites. Based upon this information, it can be concluded that rarely are five bacteria samples collected over a 30-day period. As such, it is rarely possible under the current monitoring regime to be able to calculate a geometric mean for bacteria levels based upon the 5 samples within a 30-day period requirement. For this reason, the State currently relies on individual bacteria samples for analysis of

[6]ADEQ. 2002. *2002 Integrated Water Quality Monitoring and Assessment Report.* Arkansas Department of Environmental Quality, Little Rock, Arkansas.

use impairment from bacteria. The alternative of assessing contact recreational use support by bacteria based upon eight samples collected during the primary or secondary contact season correlates much stronger with the current bacteriological monitoring program being utilized by the State. EPA has determined that the revisions to Regulation 2.507 which include the deletion of the sentence which begins "The determination..." and the use of eight samples over the time period specified in subsection C of Regulation 2.507 are approvable.

Action: EPA approves the revisions made in Regulation 2.507.

Regulation 2.508 - Toxic Substances

The aquatic life criteria for pentachlorophenol were updated to reflect EPA's recommended criteria as specified in EPA's 2002 *National Recommended Water Quality Criteria.*[7]

Action: EPA approves the updated criteria.

References were updated for the following EPA guidance documents:

1) *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms*: "EPA 600/4-90/027F. 5th ed. December 2002)"
2) *Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*: "EPA/600/4-91/002. 4th ed. October 2002) or most recent update thereof."

Action: EPA approves the revisions to these references.

Regulation 2.509 - Nutrients

First Paragraph

EPA supports the efforts of the State in its development of the narrative nutrient criteria presented in Regulation 2.509. Development of narrative nutrient criteria is a positive step towards addressing nutrient impairment in State waters.

The following language was deleted from Regulation 2.509:

"As a guideline, total phosphorus shall not exceed 100 µg/l in streams or 50 µg/l in lakes and reservoirs except in waters highly laden with natural silts or color which reduce the penetration of sunlight needed for plant photosynthesis, or in other waters where it can be demonstrated that algal production will not interfere with or adversely affect designated uses and/or fish and wildlife propagation.

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[7]USEPA. 2002. *National Recommended Water Quality Criteria.* U.S. Environmental Protection Agency, Office of Water, Washington, D.C. EPA-822-R-02-047.

The Commission may establish alternative nutrient limitations for lakes, reservoirs and streams, and shall incorporate such limitations into appropriate water quality management plans."

Since the total phosphorus concentrations provided for in the deleted language were not actually criteria limits, but served only "as a guideline," EPA supports the replacement of this deleted language with the narrative *criteria* for nutrients which have been included in the first paragraph of Regulation 2.509. The new narrative explains that assessment of nutrient impairment to waterbodies will be based upon the analysis of a combination of factors. Although since 1998, EPA has recommended that all states develop numeric nutrient criteria as integral measures to better manage nutrients,[8, 9] EPA believes that inclusion of the new narrative nutrient criteria in Regulation 2.509 is supportive of the goals of the Clean Water Act and is a progressive step towards addressing impairment of waterbodies due to nutrients. Furthermore, it is EPA's understanding that the State is currently working very hard to develop a nutrient criteria plan as called for in Geoffrey Grubb's 2001 memorandum.[10]

At this time EPA is taking no action on the final sentence in the first paragraph of the nutrient provision in Regulation 2.509, which states, "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." Because EPA is taking no action on this sentence, it is not effective for Clean Water Act purposes. However, the sentence is still effective under State law.

EPA's rationale for taking no action on this sentence is based upon the absence of a Department assessment methodology for nutrients as specified in the revised provision. However, it is EPA's understanding that the Department is currently working towards the development of such an assessment methodology for nutrients and intends to refine their assessment tools (such as their Index of Biotic Integrity (IBI) and percent dissolved oxygen saturation and diurnal fluctuation) to determine impairment by nutrients. EPA supports the efforts of the State in this endeavor, and will move to approve this sentence once an assessment methodology for nutrients has been developed by the State. EPA is sensitive to the fact that development of such an assessment methodology will occur step-wise, with

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[8]USEPA. 1998. *Clean Water Action Plan: Restoring and Protecting America's Waters*. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. EPA 840-R-98-001.

[9]USEPA. 1998. *National Strategy for the Development of Regional Nutrient Criteria*. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. EPA 822-R-98-002.

[10]USEPA. 2001. *Memorandum: Development and Adoption of Nutrient Criteria into Water Quality Standards*. U.S. Environmental Protection Agency, Office of Science and Technology, Washington, D.C. website - http://www.epa.gov/waterscience/criteria/nutrientswqsmemo.pdf.

increasingly more comprehensive assessment and implementation methods over time. However, in order to be able to approve this sentence, EPA encourages the State to develop within a reasonable time frame (for example, six months), a basic, baseline assessment methodology. This baseline assessment methodology could include a description of the approach the State will use to assess for nutrient impairment, as well as guideline values for the indicators as provided in the revised nutrient narrative provision (such as dissolved oxygen saturation, diurnal dissolved oxygen fluctuations, pH values, etc.). These values would serve as guidelines in assessing data for nutrient impairment and could be modified as more data becomes available and as more research is conducted which clarifies what values are most appropriate for assessing water bodies for nutrient impairment.

Second and Third Paragraphs

In addition to the narrative nutrient criteria which has been included in Regulation 2.509 and applies to all waters within the State, the following language has been added into the regulation to specifically address certain point source discharges within the State:

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

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

For discharges from point sources which are greater than 15 mgd, reduction of phosphorus below 1 mg/L may be required based on the magnitude of the phosphorus load (mass) and the type of downstream waterbodies (e.g., reservoirs, Extraordinary Resource Waters). Additionally, any discharge limits listed above may be further reduced if it is determined that these values are causing impairments to special waters such as domestic water supplies, lakes or reservoirs or Extraordinary Resource Waters."

Overall, the provision to limit point source discharges of total phosphorus in waters within nutrient surplus watersheds and in waters listed on Arkansas' 303(d) list (with phosphorus as major cause of impairment) is expected to prevent and/or reduce impairments to these scenic streams. The total phosphorus effluent discharge limits will provide permit limit controls for phosphorus which will go

into place in the relevant NPDES permit much sooner than the total maximum daily loads (TMDLs) for these waterbodies can be completed and translated into a permit limit. In this way, nutrient impairment due to phosphorus loadings from point sources can be addressed in the interim, while TMDLs are being completed.

Implementation of these limits should restore attainment of the downstream designated uses listed for nutrient impairment caused by excessive phosphorus from point sources. Instream monitoring following compliance with the permit limits will be done to determine if attainment has been accomplished. This monitoring will be the same as used to originally list the water body for non-attainment. If attainment has not been achieved based on this additional monitoring, and the waterbody is still determined to be impaired, further nutrient controls will be required. This phased approach provides a common sense approach to restoration. – My language

Action: EPA approves the revised provision in Regulation 2.509, with the exception of the final sentence in the first paragraph of this provision for which EPA is taking no action. [*See further discussion concerning nutrient criteria in* **Comments** section below].

Reg. 2.511 - Mineral Quality

A name was changed from "Hurricane Creek from Hurricane Lake Dam to Ben Ball Bridge" to "Hurricane Cr from Hurricane Lk. Dam to Ben Ball Brdg."

A revision was made to correct a typo for Bois d'Arc Creek from Caney Creek to Red River in the Red River Basin for TDS (changed number from 20 to 420).

Action: EPA approves these revisions.

Reg. 2.512 - Ammonia

An entire new provision for ammonia has been added to the Arkansas water quality standards as Regulation 2.512. The criteria set forth in subsections A, B, and C, of this new provision are identical to the latest EPA recommended criteria for ammonia based upon EPA's *1999 Update of Ambient Water Quality Criteria for Ammonia.*[11] Previously, the State did not have any water quality criteria established for ammonia. Although there is some concern as to the protectiveness of the current national criteria for ammonia for mussel species, the State's adoption of the EPA's 1999 recommended criteria for ammonia, in general, provides more protection for aquatic life, including threatened and endangered species, than previously existed under the State's prior water quality standards.

[11]USEPA. 1999. *Update of Ambient Water Quality Criteria for Ammonia.* U.S. Environmental Protection Agency, Office of Water, Washington, D.C. EPA 822-R-99-014.

Furthermore, EPA cannot *require* the states to adopt criteria that are more stringent than EPA's recommended criteria.

Ammonia is included as part of the ongoing National Consultation with the Fish and Wildlife Service (FWS) on threatened and endangered species as provided for in the national Memorandum of Agreement between the EPA and the FWS, which was scheduled to begin at the end of July 2004. In light of recent data for mussels, the EPA will be utilizing the national consultation as a forum to revisit the national recommended criteria for ammonia and to determine whether the 1999 criteria for ammonia should be revised or procedures established for conducting site-specific ammonia criteria where mussels are present.

In addition to subsections A, B, and C which follow EPA's recommended ammonia criteria, a subsection D has also been included in the new provision. Subsection D describes how ammonia permit limits will be calculated for permitted dischargers. Clarification has been received from ADEQ regarding when fish early life stages are expected to be present and when fish early life stages are expected to be absent. ADEQ has stated[12] that while there is temperature variability from the northern part of the state to the southern, the months when early life stages are absent generally include November through March, with April through October generally representing the time period when early life stages are present.

ADEQ has further stated[12] that ecoregion values for pH and temperature taken from least disturbed streams will be used in determining whether or not the ammonia criteria is being attained. Fisheries data suggest that warm water fishes initiate spawning activities within the range of 15°C to 16°C. For this reason, a temperature of 14°C was chosen as the temperature to use when determining whether or not the ammonia criteria is being met when fish early life stages are absent. When fish early life stages are present (during the months of April through October), defaulting to the ecoregion temperature standard as specified in subsection D provides an extra measure of protection to aquatic life from ammonia toxicity.

> **Action:** Based upon the information presented above, EPA is approving Arkansas' new provision for ammonia found in Regulation 2.512, subject to the results of the national 304(a) consultations under Section 7 (d) of the Endangered Species Act. Section 7(d) of the ESA prohibits irreversible or irretrievable commitments of resources that have the effect of foreclosing

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[12]ADEQ. 2004. *Responsiveness Summary for Regulation No. 2, Regulation Establishing Water Quality Standards for Surface Waters of the State of Arkansas.* Arkansas Department of Environmental Quality, Little Rock, Arkansas. Docket No. 03-003-R.

the formulation or implementation of reasonable and prudent alternatives which would not violate section 7(a)(2) of the ESA. EPA's approval decision does not foreclose either the formulation by the Services, or the implementation by EPA, of any alternatives that might be determined in the national consultation to be needed to comply with section 7(a)(2). By approving the standards "subject to the results of consultation under section 7(a)(2) of the Endangered Species Act," EPA has explicitly stated that it retains its discretion to take appropriate action if the consultation identifies deficiencies in the standards requiring remedial action by EPA. EPA retains the full range of options available under section 303(c) for ensuring water quality standards are environmentally protective.

G. Chapter 6: Effective Date

Language changed from: "This regulation, as amended, shall be in full force and effect upon adoption by the Commission, and 10 days following filing with the Office of Secretary of State" to: "This regulation is effective ten (10) days after filing with the Secretary of State, The State Library, and the Bureau of Legislative Research."

Action: EPA approves this revision.

H. Appendix A: Designated Uses, Specific Standards and Maps of Waters of the State by Ecoregions

Ouachita Mountains Ecoregion: (Plate OM-2)
Gulf Coastal Ecoregion: (Plates GC-2 and GC-4)

The revisions to these plates provide clarification of the location of the ecoregion boundary between the Ouachita Mountains and Gulf Coastal Plains adjacent to the Ouachita River below Lake Catherine and Lake DeGray. Several reservoirs (Catherine, DeGray, Greeson, Dierks, Gillham, and DeQueen) have been constructed very near the "Fall Line," which generally follows the ecoregion boundary between the Ouachita Mountains and the Gulf Coastal Plains. The original intent and general logic would conclude that the best location for changes from an upland ecoregion to a lowland ecoregion would be below the dam of a reservoir when it is obvious that the physiographic changes occur near the general area of the reservoir. The current ecoregion maps in Regulation No. 2 clearly show that the ecoregion boundaries are located immediately below the dams of Lakes Greeson, Dierks, Gillham, and DeQueen; however, this is not as apparent below Lake Catherine Dam and below Lake DeGray. Slight modifications of the ecoregion plates GC-2, GC-4, and OM-2 have been made to make the ecoregion

boundaries consistent below all of these reservoirs. These revisions also assure that the water quality standards below the dams are the same as the downstream ecoregion standards.

Action: EPA approves the revisions to the ecoregion plates: GC-2, GC-4, and OM-2.

Ouachita Mountains Ecoregion: (Plate OM-2)

Another revision to this plate was made to correct a mapping error in the Extraordinary Resource Water designation (dashed line) of a tributary to the Middle Fork of the Saline River named Brushy Creek. The correction does not change the Extraordinary Resource Water designation for the Middle Fork of the Saline River.

Action: EPA approves the revision to the Ouachita Mountains Ecoregion plate OM-2.

Delta Ecoregion - Designated Uses

The State of Arkansas has two distinct subcategory fishery uses within the Delta Ecoregion fishery use. The first subcategory use is the "least-altered" fishery and the second is the "channel-altered" fishery. The channel-altered fishery is characterized by the absence of sensitive species, whereas the least-altered fishery is characterized by an insignificant proportion of sensitive species. Therefore, EPA views the channel-altered fishery as meeting the 101(a)(2) use as specified under the Clean Water Act, but as being a lower use due to the more tolerant biological community. Furthermore, the channel-altered fishery subcategory use in the Delta is associated with less stringent turbidity and temperature criteria.

New language has been added to Appendix A in the Delta Ecoregion-Designated Uses section to describe the characteristics of waterbodies that could be designated with the Delta Ecoregion fishery subcategory use "channel-altered." The description provided in Appendix A for "channel-altered" streams is approvable since it simply provides a description of the characteristics to be analyzed in determining whether a stream should be designated with the "channel-altered" fishery subcategory use.

In addition to providing a new description for the "channel-altered" fishery subcategory use, new language in the Delta Ecoregion-Designated Uses section of Appendix A also identifies four specific waterbodies as being "channel-altered" Delta Ecoregion streams (Cache River, Bayou DeView, Village Creek, Blackfish Bayou), and states that others will be determined by the Department on a case-by-case basis. Water Division staff from ADEQ have provided a use attainability

analysis (UAA) which supports the designation of these four waterbodies as "channel-altered" Delta Ecoregion streams. EPA may approve the "channel-altered" fishery subcategory use for other waterbodies in the Delta Ecoregion on a case-by-case basis, but only after submittal of a UAA for the waterbody.

Action: EPA approves these revisions to the Delta Ecoregion-Designated Uses section of Appendix A.

I. Appendix C: Scientific Names of Fishes

Two new species and their associated common names, family names, and species names were included in Appendix C. These new species were added into Appendix C based upon their inclusion in Regulation 2.302: (F)(3)(a) Ozark Highlands Ecoregion stream fishery use as new key species.

Action: EPA approves the revisions to Appendix C.

III. Comments

NOTE

The following provides comments on the new and revised provisions adopted in Arkansas' Regulation No. 2. It is the opinion of EPA Region 6 that consideration of these comments would help to strengthen the water quality standards program in Arkansas.

A. Chapter 4: General Standards

Regulation 2.405 - Biological Integrity

The final sentence in the Biological Integrity provision at Regulation 2.405 states that: "It is the responsibility of the Department to collect and evaluate the data for an aquatic biota assessment and such data will not be used to develop or impose permit limits." EPA interprets this statement to mean that biological data will not be used to establish permit limits which require a certain assemblage of aquatic species to be present in a waterbody receiving a discharge. Biological criteria are used, however, within water programs to refine use designations, establish criteria for determining use attainment/nonattainment, evaluate effectiveness of current water programs, and detect and characterize previously unknown impairments. If biological impairment of a waterbody is detected, and evaluation through a biological assessment reveals the cause of the impairment as originating from a specific discharge, then biological data may serve as the basis for imposing permit limits on that discharger.

NOTE

B. Chapter 5: Specific Standards

Regulation 2.503 - Turbidity

Inclusion of a definition for "storm-flow" would help to clarify which data is being used to make attainment decisions.

Regulation 2.509 - Nutrients

As mentioned previously, EPA supports the efforts of the State in its development of the narrative nutrient criteria. Development of a narrative nutrient criteria is a positive step towards addressing nutrient impairment in State waters. However, since 1998, EPA has recommended that all states develop numeric nutrient criteria as integral measures to better manage nutrients.[8,9] In 2001, EPA provided additional guidance[10] and further detail on options for developing nutrient criteria, and also recommended that all states prepare nutrient criteria plans. This guidance specifies that states develop numeric criteria or quantitative translators for total nitrogen, total phosphorus, water clarity (turbidity), and chlorophyll *a*. States have been requested to develop nutrient criteria plans, and make substantial progress in developing numeric criteria, or to have begun the administrative process of adopting these criteria, by the end of 2004. The plans are not approved by EPA, but they should be mutually agreed to by the states and EPA. EPA looks forward to continued coordination with ADEQ on development of a nutrient criteria plan, and providing technical assistance as needed.