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BeaverWaterDistrict

May 8, 2013
Via email: reg-comment@adeq.state.ar.us

Doug Szenher
Public Outreach and Assistance Division
Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118

Re: Proposed Changes to APCEC Regulation No. 2

Dear Mr. Szenher:

The following comments regarding the proposed changes to the Arkansas water quality standards in Arkansas Pollution Control and Ecology Commission (APCEC) Regulation No. 2 (hereinafter "Reg. 2") are submitted on behalf of the Beaver Water District (BWD). These comments supplement the verbal comments made by BWD representatives at the public hearing in Fayetteville on April 18, 2013. BWD is the largest of the four drinking water utilities whose source of raw water is Beaver Lake and is the second largest drinking water utility in Arkansas. BWD provides drinking water to over 300,000 people and numerous businesses and industries.

Comment 1, Proposed Reg. 2.509(B), site-specific water quality criteria for Chlorophyll a and Secchi Transparency for Beaver Lake: *BWD supports the addition of site-specific numeric water quality criteria (WQC) for Chlorophyll a and Secchi Transparency for Beaver Lake that are at least as stringent as those proposed by the Arkansas Department of Environmental Quality (ADEQ).* ADEQ's proposed WQC are as follows:

(B) Site Specific Nutrient Standards

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

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

Chlorophyll a and Secchi Transparency measurements serve as indicators of the level of nutrient enrichment and algal growth in the Lake. The above 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. *See* "Beaver Lake Site-Specific Water Quality Criteria Development: Recommended Criteria," prepared by FTN-Associates, Ltd., February 8, 2008, a copy of which was submitted to ADEQ in support of BWD's comments via electronic mail on April 24, 2013.

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. Evaluation of data from 2005 and 2006 shows the upper one-third (1/3) of Beaver Lake already to be eutrophic or to have an overabundance of algae. *See* Koller Iriarte, Monica A., Trophic Conditions and Nutrient Limitations in the Headwaters of Beaver Lake, Arkansas, During a Dry Hydrologic Year, 2005-2006, Masters Abstracts International, Vol. 45, No. 04 (2007), a copy of which was submitted to ADEQ via electronic mail on April 24, 2013.

As stated by C.W. Callinan *et al.* in a 2013 Journal of the American Water Works Association (AWWA) article, "Nutrient enrichment of lakes and reservoirs used for PWS [potable water supply] can lead to a wide range of adverse effects ranging from operational problems (*e.g.,* filter clogging) to customer nuisance complaints (*e.g.,* taste and odor issues) to potential increases in certain human health-related risks. Human health-risk factors that may be exacerbated by nutrient enrichment include increased generation of disinfection by-products (DBPs), increased production of cyanotoxins by certain types of cyanobacteria, and increased arsenic concentrations. . . ." *See* Callinan, C.W. *et al.*, "Proposed nutrient criteria for water supply lakes and reservoirs," page E157, available online at http://dx.doi.org/10.5942/jawwa.2013.105.0034. (A copy of the full article was submitted to ADEQ via electronic mail on April 24, 2013; an expanded summary of the article was published in the AWWA Journal, April 2013, Vol. 105, No. 4, pages 47-48). Callinan *et al.* investigated 21 lakes and reservoirs in New York and reported that "a mean Chlorophyll a threshold of 4 to 6 micrograms per liter would likely be protective of potable water supply lakes and reservoirs." *Id.* Those mean Chlorophyll a threshold values of 4 to 6 micrograms per liter are generally in keeping with how ADEQ's proposed 8 micrograms per liter criteria at Hickory Creek on Beaver Lake would translate to a value at BWD's intake, which is the intake furthest upstream of the four public water supply intakes on Beaver Lake.

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. BWD already has seen an increase in DBP precursors in the water at our intake. The limits on DBPs under the Safe Drinking Water Act were tightened by the Stage II Disinfectant/Disinfection By-Products (D/DBP) Rule that became applicable in October 2012 to BWD and its four customer cities of Fayetteville, Springdale, Rogers, and Bentonville. As a consequence, BWD spent approximately five million dollars ($5,000,000) in 2012 to construct a chlorine dioxide facility in order to maintain compliance with the D/DBP Rule. Annual operation and maintenance costs for the chlorine dioxide facility are expected to be approximately five hundred thousand dollars ($500,000) per year.

In addition, 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. (MIB and Geosmin are not considered health risks in water supplies, but they degrade the aesthetic quality of treated water considerably). BWD currently treats these taste and odor events with pre-oxidation through the addition of

potassium permanganate. During the last decade, however, the concentration of MIB has been such that this treatment is insufficient to remove the taste and odor.

Should the taste and odor events increase in frequency and intensity in the future, additional treatment may become necessary. In 2008, BWD commissioned a preliminary engineering investigation on methods to remove MIB and Geosmin to non-detectable levels. The recommended alternative was ozonation and the addition of powdered activated carbon. At the time, total capital costs for implementing the recommended alternative were estimated to be forty-two million two hundred thousand dollars ($42,200,000) and annual operation and maintenance costs for the system were estimated at seven hundred ninety thousand dollars ($790,000).

Increases in algal growth due to nutrient enrichment also 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). Studies by Dearmont *et al.* in Texas in 1998 showed that every one percent increase in turbidity resulted in a 0.25 percent increase in chemical costs for water treatment. See Dearmont, D., B. A. McCarl, and D.A. Tolman, Costs of water treatment due to diminished water quality: A case study in Texas, Water Resources Research, Vol. 34, No. 4, pp. 849 – 853 (1998), a copy of which was submitted to ADEQ via electronic mail on May 7, 2013. Algal blooms also can cause operational problems for our treatment processes, such as the clogging of our filters.

BWD suggests one modification to ADEQ's proposed WQC for Chlorophyll a for Beaver Lake in the language following the double asterisk. *BWD suggests that it be changed to read as follows: "**The geometric mean of the growing season (May – October) values for the most recent 3 consecutive years."* Magnitude, frequency and duration are recommended factors for inclusion in nutrient criteria by EPA. *See* Gibson, G., R. Carlson, J. Simpson, E. Smeltzer, J. Gerristen, S. Chapra, S. Heiskary, J. Jones, and R. Kennedy, "Nutrient Criteria Technical Guidance Manual for Lakes and Reservoirs," U.S. Environmental Protection Agency, EPA-822/800-001 (2000). The proposed Beaver Lake Chlorophyll a WQC included the magnitude *(i.e.*, 8 ug/L) and the frequency (*i.e.*, the growing season (May-October)), but did not include duration. A three (3) year running geometric mean is recommended for the duration. A three year running geometric mean can account for both seasonal variability in Chlorophyll a and interannual hydrologic variability. The three years is also based on studies specifically analyzing data from reservoirs in Missouri by Jones and Knowlton and similar studies analyzing interannual variability in Chlorophyll a and other water quality constituents by DeHoyes and Comin and Jassby. *See* DeHoyes, C. and F.S. Comin, "The importance of inter-annual variability for management," Hydrobiol. 395/396: 281-291 (1999); Jassby, A.D., "Interannual variability at three inland water sites: implications for sentinel ecosystems," Ecol. Appl. 8: 277-287 (1998); Jones, J.R. and M.F. Knowlton, "Chlorophyll response to nutrients and non-algal seston in Missouri reservoirs and oxbow lakes," Lake Reserv. Manage. 21: 361-370 (2005); Knowlton, M.F. and J.R. Jones, "Natural variability in lakes and reservoirs should be recognized in setting nutrient criteria," Lake Reserv. Manage. 22: 161-166 (2006a); and Knowlton, M.F. and J.R. Jones, "Temporal variation and assessment of trophic state indictors in Missouri reservoirs: implication for lake monitoring and management," Lake and Reserv. Manage. 22: 261-271

(2006b). ***To the extent that other commenters suggest it, BWD would object to inclusion of a duration longer than three (3) years and to the inclusion of an allowable exceedance rate such as twenty-five percent (25%) as not legally or scientifically supportable.***

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 site-specific numeric water quality criteria for Chlorophyll a and Secchi Transparency for Beaver Lake that are at least as stringent as those in proposed Reg. 2.509(B) be adopted.

Comment 2, Proposed Reg. 2.509, the removal of the phosphorus requirements for point source discharges into specified waterbodies: *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 the 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, as set forth in Comment 1 above.

The deletion of the Reg. 2.509 phosphorus requirements also 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. ADEQ has conducted none of the analyses that would be required by Reg. 2.201 through 2.203 and 40 C.F.R. § 131.12 in order to consider removal of the Reg. 2.509 phosphorus requirements. See EPA Water Quality Standards Handbook, Second Edition, Chapter 4 and Appendix G (1994), copies of which were submitted to ADEQ via electronic mail on May 7, 2013.

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. The Reg. 2.509 phosphorus requirements also conform with one of the purposes of the Arkansas water quality standards set forth in Reg. 2.102, which is " . . . to prescribe regulations necessary for implementing, achieving and maintaining the prescribed water quality." Certainly, the numeric phosphorus requirements serve to implement, achieve, and maintain the narrative nutrient requirements of Reg. 2.509 as to the specified waterbodies.

ADEQ's proposal to delete the Reg. 2.509 phosphorus requirements for point source discharges into certain waterbodies in the legislatively designated nutrient surplus watersheds and on Arkansas's list of impaired waterbodies because they are not water quality standards is inconsistent with its approach regarding the Oil and Grease standards at Reg. 2.510. ADEQ has proposed at Reg. 2.510 that, "Oil and grease shall be an average of no more than 10 mg/l or a

maximum of 15 mg/L when discharging to surface waters." If this type of discharge-related requirement is an acceptable water quality standard for oil and grease (and BWD believes they are), then discharge-related requirements for phosphorus also should be acceptable.

The deletion of the Reg. 2.509 phosphorus requirements -- absent any of the analyses that would be required by Reg. 2.201 through 2.203 and 40 C.F.R. § 131.12 and absent the adoption of any equivalent or more stringent provisions regarding phosphorus or nutrients -- clearly runs afoul of the antidegradation laws and regulations cited above. 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 current 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.*

Comment 3, Proposed Reg. 2.507, Bacteria: The United States Environmental Protection Agency (EPA) issued Recreational Water Quality Criteria (RWQC) recommendations regarding bacterial indicators on or about November 29, 2012. According to EPA, the recommended RWQC are based on the latest research and science, including "an extensive review of the available scientific literature and evaluation of new information from studies . . . and after public notice and comment . . . ." *See* EPA Recreational Water Quality Criteria, Office of Water Document 820-F-12-058, p.1 (2012). Copies of the RWQC document, including Appendices A, B, and C, and the December 2012 EPA revised fact sheet regarding the 2012 RWQC were submitted to ADEQ via electronic mail on May 7, 2013.

To the extent that the EPA 2012 RWQC are more protective than the current or proposed bacteria standards at Reg. 2.507, BWD requests that ADEQ incorporate the more protective provisions into Reg. 2.507. BWD's interest, of course, is in minimizing pathogens in our source water. In this case, the latest science regarding the protection of public health during primary contact recreation also supports BWD's goal of protection of our drinking water source. Therefore, BWD encourages the incorporation of the following more-protective recommendation from the EPA 2012 RWQC for primary contact recreation:

> ***Enterococci:*** *Culturable enterococci at a geometric mean (GM) of 30 colony forming units (CFU) per 100 milliliters (mL) and a statistical threshold value (STV) of 110 CFU per 100 mL; and*
>
> ***Escherichia coli (E.Coli):*** *Culturable E. coli at a GM of 100 CFU per 100 mL and a STV of 320 CFU per 100mL; and*
>
> *The waterbody GM should not be greater than the applicable GM magnitude in any 30-day interval. There should not be greater than a ten percent excursion frequency of the applicable STV magnitude in the same 30-day interval.*

In the event that ADEQ decides not to incorporate the more-protective recommendations from the 2012 EPA RWQC, BWD offers the following: BWD, in general and subject to the following restrictions, supports the proposed changes to Reg. 2.507 that have made this provision more readable. *BWD objects, however, to the changes that have deleted: (1) the primary contact season 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); and (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. BWD also questions the language regarding the "assessment of ambient waters" and the calculation of the geometric mean. To the extent that other commenters suggest it, BWD would object to inclusion in Reg. 2.507 of an allowable exceedance rate such as twenty-five percent (25%) as not legally or scientifically supportable.*

Although the current Reg. 2.507(A) and (B) is somewhat difficult to parse, 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. BWD is aware that ADEQ has not been following the language of the current Reg. 2.507(A) and (B), and has so commented to ADEQ in regards to the proposed Arkansas 2010 List of Impaired Waterbodies. In response to BWD's comment, ADEQ failed to provide an explanation of how the current Reg. 2.507(A) and (B) could be interpreted to omit the geometric mean criteria for *E.Coli* in waters other than Lakes, Reservoirs, ERW, ESW, and NSW. See ADEQ's April 1, 2010, Responsiveness Summary to Comments Concerning Arkansas's 2010 Impaired Water Bodies (303(d)), page 16, ADEQ Response 7 (a copy of the cover letter and page 16 of the Responsiveness Summary was submitted to ADEQ via electronic mail on May 8, 2013).

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. ADEQ has conducted none of the analyses that would be required by Reg. 2.201 - 2.202 and 40 C.F.R. § 131.12 in order to consider removal of the primary contact season *E.Coli* geometric mean criteria of 126 colonies/100mL for waters other than Lakes, Reservoirs, ERW, ESW, and NSW and of the secondary contact season *E.Coli* geometric mean criteria of 630 colonies/100mL for waters other than Lakes, Reservoirs, ERW, ESW, and NSW. *See* EPA Water Quality Standards Handbook, Second Edition, Chapter 4 and Appendix G (1994), copies of which were submitted to ADEQ via electronic mail on May 7, 2013. Therefore, the current Reg. 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.

Finally, 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 in a number of regards. First, what is meant by the phrase "for assessment of ambient waters"? Does this refer to ascertaining compliance with the water quality standards, or to assessing impairment for purposes of the 303(d) list, or both, or something else? Is a "data point" the same as a sample or is it something else? 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 "cherry picking" of the thirty day period that gives the best results, while ignoring other samples.*

To the extent that other commenters suggest it, BWD would object to inclusion in Reg. 2.507 of an allowable exceedance rate such as twenty-five percent (25%) as not scientifically supportable. EPA's 2012 RWQC document recommends that the geometric mean value for *E.Coli* (and enterococci) not be exceeded in any 30-day interval. For the *statistical threshold value for E.Coli* (and enterococci), EPA's 2012 RWQC document recommends that there should not be greater than a ten percent (10%) excursion frequency in the same 30-day interval. *See* EPA Recreational Water Quality Criteria, Office of Water Document 820-F-12-058 (2012). Copies of the RWQC document, including Appendices A, B, and C, and the December 2012 EPA revised fact sheet regarding the 2012 RWQC were submitted to ADEQ via electronic mail on May 7, 2013.

To the extent that other commenters suggest it, BWD would strenuously object to adding a requirement that streams shall not be designated as domestic water supplies for the purposes of Reg. 2.507 until site verification indicates that such use is attainable. This would be contrary to the existing designated uses in Reg. 2 and would be 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. It also would be poor public policy for the State.

Comment 4, Reg. 2.106, Definitions for Aquatic life, Seasonal aquatic life, Fishery, and Seasonal Fishery and Reg. 2.302(F), Designated Use: *BWD supports* the proposed addition of definitions for Aquatic life and Seasonal aquatic life and the proposed deletion of the definitions for Fishery and Seasonal Fishery. BWD also supports the proposed use of "aquatic life" to 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.

Comment 5, Proposed Reg. 2.106, Definition for Critical Flows for Minerals: This language pertains to "background dilution flows" to be used in calculating NPDES permit limits. *BWD supports the proposed changes to the critical flow language regarding minerals criteria.* The language regarding critical flows for the purposes of the minerals criteria should, as proposed, be based on actual flows as represented by the harmonic mean flow (for the purposes of the Reg.

2.511(B) Ecoregion Reference Stream Minerals Values) or the Q7-10 value (for the purposes of the Reg. 2.511(C) Domestic Water Supply Criteria), and not on arbitrary, scientifically indefensible numbers such as the automatic four (4) cubic feet per second (cfs) in the current regulation or in the recently enacted Act 954 of 2013.

In addition to being scientifically indefensible, the stream flow provisions in the new A.C.A. §§ 8-4-202(b)(3)(B) are unclear and void for vagueness. To the extent that Act 594 of 2013 may be interpreted as adding a dilution factor when establishing numeric minerals water quality criteria as well as when assessing in-stream minerals concentrations, it is contrary to the federal Clean Water Act and its implementing regulations at 40 C.F.R. § 131.11. *See also* EPA Water Quality Standards Handbook, Second Edition, Chapter 3 (1994), a copy of which was submitted to ADEQ via electronic mail on May 8, 2013. Another possible interpretation of Act 594 (and another example of why Act 594 is void for vagueness) is that the stream flow provisions are limited to setting wastewater discharge (NPDES) permit limits, which also would be contrary to the federal Clean Water Act and its implementing regulations at 40 C.F.R. § 131.11. It would mean that the higher the stream flow used as background dilution, the higher or less stringent the permit limit. The use of a *minimum* dilution factor of 4 cfs for minerals, even where actual stream flow measurements show a lower number to be representative of the real stream conditions, is scientifically indefensible. A flow of 4 cfs equals 1,800 gallons per minute. This is a lot of water for streams that are often dry or reduced to a trickle during the critical season. Another possible interpretation of Act 594 would allow an even higher dilution factor: the use of the *average* flow in a stream if that is higher than 4 cfs. Average flows will over-represent storm flows and will not be reflective of actual stream conditions most of the time. Average stream flows often are tens to hundreds of times higher than the harmonic mean stream flow, which is a much better representation of the normal conditions in a stream.

What is scientifically defensible and legally supportable is, as proposed by ADEQ, the use of the harmonic mean flow (which, among other things, accounts for flood events and evens out their impact) for the purposes of the Reg. 2.511(B) Ecoregion Reference Stream Minerals Values and the use of the more-protective Q7-10 value for the purposes of the Reg. 2.511(C) Domestic Water Supply Criteria.

Comment 6, Reg. 2.106, Definition for Primary Season Critical Flow: It is unclear how this definition would operate in conjunction with the Reg. 2.106 definition for Critical Flow. BWD also questions whether the automatic one (1) cfs allowed for watersheds less than ten (10) square miles is scientifically sound and legally supportable.

Comment 7, Proposed Reg. 2.405, Biological Integrity: *BWD supports the proposed changes.* BWD agrees that it should not be the sole responsibility or purview of ADEQ to "collect" the data for an aquatic biota assessment. There are a number of entities qualified to collect the data for an aquatic biota assessment. It also makes sense scientifically for ADEQ to be able to utilize available aquatic biota assessments where appropriate in developing NPDES permit limits.

Comment 8, Proposed Reg. 2.510, Oil and Grease: Proposed Reg. 2.510 states that "Oil and grease shall be an average of no more than 10 mg/L or a maximum of 15 mg/L when discharging

to surface waters." *BWD believes that this should be corrected* to provide that "Oil and grease shall be an average of no more than10mg/L or a maximum of no more than 15 mg/L when discharging to surface waters." (Words added are underlined).

Comment 9, Proposed Reg. 2.511, Mineral Quality: In general, BWD strongly supports the changes to Reg. 2.511 as they have made this provision much clearer and more science-based. To the extent that ADEQ contemplates making different changes to Reg. 2.511 as a result of Act 594 of 2013, *BWD requests that an additional public notice and comment period be held on Reg. 2.511.* As noted in Comment 5 above, BWD believes Act 594 to be void for vagueness, contrary to the federal Clean Water Act and its implementing regulation, and premised on unscientific thought and conclusions.

Comment 10, Reg. 2.302(G), Domestic Water Supply Designated Use: *BWD requests that the last sentence in this provision be changed to read as follows:* Conditioning or conventional treatment consisting of no more than flocculation, coagulation, sedimentation, filtration, and disinfection may be necessary prior to use. (Words added are underlined).

Thank you for your consideration of these comments.

Sincerely,

Colene Gaston

Colene Gaston
Staff Attorney

Attachments:
Attachment 1: FTN- Associates, Ltd., Beaver Lake Site-Specific Water Quality Criteria Development: Recommended Criteria (2008);
Attachment 2: Koller Iriarte, Monica A., "Trophic Conditions and Nutrient Limitations in the Headwaters of Beaver Lake, Arkansas, During a Dry Hydrologic Year, 2005-2006," Masters Abstracts International, Vol. 45, No. 04 (2007);
Attachment 3: Callinan, C.W. *et al.*, "Proposed nutrient criteria for water supply lakes and reservoirs," available online at http://dx.doi.org/10.5942/jawwa.2013.105.0034; an expanded summary of the article was published in the AWWA Journal, April 2013, Vol. 105, No. 4, pages 47-48;
Attachment 4: Dearmont, D., B. A. McCarl, and D.A. Tolman, "Costs of water treatment due to diminished water quality: A case study in Texas," Water Resources Research, Vol. 34, No. 4, pp. 849 – 853 (1998);
Attachment 5: EPA Water Quality Standards Handbook, Second Edition, Chapter 4 (1994);
Attachment 6: EPA Water Quality Standards Handbook, Second Edition, Appendix G (1994);
Attachment 7: EPA Recreational Water Quality Criteria (RWQC) Revised Fact Sheet (December 2012);
Attachment 8: EPA RWQC, Office of Water Document 820-F-12-058 (2012).
Attachment 9: Appendix A to the EPA RWQC (2012);

Attachment 10: Appendix B to the EPA RWQC (2012);
Attachment 11: Appendix C to the EPA RWQC (2012);
Attachment 12: ADEQ Cover Letter and Responsiveness Summary to Comments Concerning Arkansas's 2010 Impaired Water Bodies (303(d)), page 16 (April 1, 2010); and
Attachment 13: EPA Water Quality Standards Handbook, Second Edition, Chapter 3 (1994).

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