

Comments on Regulation 6 and Regulation 5 Revisions

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<http://water.adeq.commentinput.com/?id=6pAef>

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Thank you for the opportunity to submit my comments. There is a plethora of substantial reasons and evidence that support the Regulation 5 and 6 permanent moratorium on swine CAFOs in the Buffalo National River watershed.

These have been deeply analyzed and submitted in comments to ADEQ by the Buffalo River Watershed Alliance and the Ozark Society, not to mention the many other thoughtful and thorough comments by Arkansas citizens who love and want to protect the waters of this national treasure.

My own comments adopt those of the Buffalo River Watershed Alliance in addition to points that I will make here. The purpose of regulating Confined Animal Feeding Operations in this watershed can be summed up by the following statement in a 2013 article co-authored by Dr. Andrew Sharpley, the “Phosphorus King” of the academic Soil Science world, who developed the Arkansas Phosphorus Index, and was the lead investigator of the Big Creek Research and Extension Team (BCRET). Addressing the seriousness of legacy phosphorous:

“... we face unprecedented challenges in meeting water quality targets, given that P legacies from past land management may continue to impair future water quality, over time scales of decades, and perhaps longer.”

(<https://www.nrcresearchpress.com/doi/full/10.4141/cjss09106#.XgonxBdKifU>)

Since the publication of that article in 2013, the C&H hog farm research has confirmed just how accurate that statement is. BCRET research and its final report, USGS, and independent volunteer research teams monitoring Big Creek and the Buffalo River have depicted the accelerating overload of phosphorus in application field run off, in ground water, and the resultant unprecedented and unseasonal spreads of algal blooms in the downstream waters of the Buffalo National River itself.

The BRWA and Ozark Society comments, (as well as the BCRET final report itself) will reveal that nitrates are also exponentially higher than were expected by BCRET. BCRET’s final report attempts to obfuscate the actual sample numbers and the limitations of their data collection by means of model designs that equalize and obscure their research, and in some cases by the inclusion of inaccurate numbers. When obvious inaccuracies were brought to light by independent analysis of the report, BCRET submitted a revised chapter of its final report. However, the rest of the report contains design flaws and numbers that bend the data to conclusions that are questionable.

Mike Smolen, PhD, of Lithochimeia, in his analysis of the BCRET final report put it this way:

The most notable outcome of water quality monitoring on Big Creek is the significant increase in Nitrate-N concentration documented below the C&H disposal fields (BC7 5-yr average NO₃-N 0.29 mg/L) compared to upstream (BC6 5-yr average NO₃-N 0.13 mg/L) (Exec Summary item 13). Further the report notes that Nitrate-N concentration is strongly influenced by streamflow noting "...the difference (i.e., downstream was greater than upstream) is very large at low flow and small at high flow. This suggests that at low flows, base flow nitrate-N emerges into Big Creek between upstream and downstream sites and that this base flow has a higher nitrate-N concentration than in base flow above the upstream site." (Exec Summary Item 18), BCRET further showed the stream loading of Nitrate-N at BC7 is almost double what is predicted based on the upstream water quality (see discussion associated with Table 1, this report).... Items 15 through 17 and 19 (BCRET Final Report, Exec Summary), used a flow-weighting model (WRTDS) to smooth the data to suggest there was no increase in Nitrate-N from 2014 through 2019 and no time trend through the period of waste application. However, the WRTDS model has high variance and extremely low R-squared, suggesting a poor fit and inadequate explanation of the variance. Further there is very little reliable data from the period before waste application to support a direct comparison or trend analysis before waste application. (p. 9, Smolen Comments)

Whether this kind of BCRET accounting was intentional or simply a result of sloppy science and math could be debated, but the "sound science" we have all awaited remains the same regardless of BCRET measures taken to prohibit accurate conclusions: Excessive phosphorus and nitrates were produced by the C & H CAFO, and even the nutrient management plans submitted for the operation's permit did not protect the soil and adjacent waters from long-term ill effects.

As I read the BCRET final report, one part especially made me think twice about the conclusions it drew. The report included a comparison of the local Big Creek watershed with the Upper Illinois and Upper White River watershed in order to submit its opinion that Big Creek was in good shape. Anyone who is familiar with the northwest Arkansas water situation is aware of the long-term battle between Oklahoma and Arkansas about impaired water quality due to excess nitrates that Arkansas has released into the waters of Oklahoma. A Nutrient Surplus Area was designated to relieve the input of nutrients to remediate that situation. If the BCRET had proposed a similar Nutrient Surplus Area restriction on the Buffalo River Watershed in their report, then this comparison might have had a purpose. Instead they used it to say that the Big Creek area is just fine because it is not worse than the other. Since the other has a large and growing urban base and innumerable poultry operations, it can only truly be useful as a warning of what can develop in a watershed through uncontrolled growth. ADEQ has prudently proposed a moratorium to limit such proliferation of waste in the Buffalo River watershed, but perhaps a Nutrient Surplus Area designation would be beneficial here as well, since waste from such designated areas can be hauled and dumped here. Mike Smolen puts it this way in his analysis of the BCRET Final Report:

Studies in the Illinois River have shown soil phosphorus concentrations often exceeding 300 ppm, more than three times the soil phosphorus currently in the Big Creek pastures. All this comparison shows is that like other watersheds in the region, watersheds with development of pasture fertilized with animal manures and other sources have higher nutrient loss than forested watersheds.

The most significant take-away from the regional study should be that the small number of additional acres of pasture, fertilized by hog slurry resulted in doubling of Nitrate-N concentration. The regional study provides a warning that expansion of production of hogs and/or chickens in or near the Buffalo River watershed would likely push the water quality closer of the Buffalo River closer to that observed in the Illinois River, where water quality has deteriorated substantially. (p. 12, Mike Smolen Comments)

Another point that has been made many times, and as a reason substantiating a denial of a new permit for the C&H CAFO, is that in karst hydrogeology groundwater flow direction is so complex and unpredictable that it is literally impossible to make accurate determinations for suitable locations for such intensive agricultural operations. Even if a single building construction site were tested with a dye trace study, every adjoining application field for waste would likely reveal different results because of subsurface fissures, fractures, sinkholes, lateral pathways, epi-karstic features, sinking springs, shallow aquifers, ad infinitum. In this part of the Ozarks, almost half of flow occurs during high rainfall storm events, which are growing increasingly common here.

From the BCRET Final Report, Chapter 7, NUTRIENT LOADS IN BIG CREEK UP AND DOWNSTREAM OF C&H FARM, Summary, p. 1:

The two largest storms occurring during each of the 5-year monitoring accounted for 44, 49, 37, and 42% of the total 5-year load of dissolved P, total P, nitrate-N, and total N, respectively, and 43% of discharge measured at BC7. At the upstream site (BC6), these same storms comprised 45, 47, 42, and 44% of dissolved P, total P, nitrate-N, and total N load, respectively, and 43% of total discharge.

The speed and depth of underground flow can change the direction that the water moves toward an outlet or aquifer. There were many storms and high rainfall events, but BCRET did not sample them. Such telling gaps in their data may account partially for the unauthenticated conclusions they make. It is difficult to monitor the Ozarks karst hydrogeology, and even with \$750,000. of state funding that were allotted for their study, they couldn't obtain or report accurate data. There is good reason why the Animal Waste Field Handbook tells us to look elsewhere for suitable CAFO locations when it addresses karst terrain.

I won't go into great detail of the substantiating scientific evidence that supports a permanent moratorium on swine CAFOs in the Buffalo River Watershed. This has already been addressed in the BRWA, Mike Smolen, and Ozark Society comments. However, I will reiterate one of the most important reasons that this area is wrong for intensive agricultural operations like C&H Farms. Having been born and lived for most of my life in the Ozarks, I am intimately acquainted with its karst hydrogeology and its deeply magnificent formations. As a child my parents often took our family on outings to enjoy this mountainous terrain. Later, while working in public schools, I initiated and led two student stream teams that monitored creeks for macroinvertebrates, ph, nutrients, dissolved oxygen, sedimentation, and EColi. We waded streams, explored Ozark caves and sink holes, and researched solutions to impaired water quality.

Now, besides its purely aesthetic appeal, the economic benefits of protecting this watershed reach many small families that often must work several jobs just to remain on their land and continue to live the kind of life they love here. Every year I see more native Newton County residents building a cabin or two on their property to supplement their income in this rural part of

our state. Other people build vacation cabins here adding to local and state tax revenue. Our own family business depends upon visitors to the Buffalo River who come to enjoy canoeing, hiking, and camping. Large scale agriculture poses a real threat to the Buffalo National River watershed, a prime destination for state tourism. When a single swine CAFO can endanger the future of so many small family ventures, it becomes practical to make the temporary moratorium a permanent regulation. The state of Arkansas benefits from this national park attraction through increased visitation as people travel through gateway towns. The local residents benefit from making additional income from cabins, restaurants, shops, and canoe concession jobs. We all benefit from sharing this undammed river with Americans who expand our own understanding of how beautiful and unique this Buffalo River country truly is. It is incumbent upon us to find ways and means to protect it and preserve it for the benefit of our own children and future generations to enjoy.

I ask that ADEQ and the legislators that represent the people of Arkansas take this important step toward conserving the Buffalo River by enacting a permanent moratorium on swine CAFOs in this watershed. If you have never visited this beautiful river, I invite you to make the short trek and see for yourselves the beauty of this Arkansas national park watershed, and why it's worth singling out for such a measure.

Sincerely,

Marti Olesen
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