

Carol Bitting

Here is the 2nd submittal to my comments.

Thank you,

Carol Bitting

Engineer Permits Branch, Office of Water Quality
5301 Northshore Drive
North Little Rock, Ar 72118-5317

October 6, 2018

My comments are in support of ADEQ's draft denial of C&H Hog Farms (C&H) permit 5264-W AFIN51-00164 and for a denial decision with immediate closure so that the streams this facility contributes degradation to and remediation begin immediately to restore the Extraordinary Resource Waters, Ecologically Sensitive Waters and Natural or Scenic Waterways as protected by Congress.

I will attach prior comments to this denial and my position is still a denial of the permit and all permits in the Buffalo River watershed until the State of Arkansas has determined stream nutrient criteria and agronomic soil rates for the natural, unique and scenic qualities of the karst area of the Buffalo National River.

I have searched sites such as the Regulation 6 permit ARG590001¹ the CAFO is operating under at this time. Original permit states 4,000 nursery pigs and 5264-W states 750. Reducing these numbers to 750 nursery pigs averaging 10 lbs each reduces waste to 7,500 lbs verses 40,000 lbs in 2012. This becomes concerning when you are figuring how much waste is being produced, stored and spread on the fields already saturated with phosphorous.

5264-W permit increases the number of sows from previous permit of 2500 sows to 2672. 2018 USDA reports a sow will average between 27-29 pigs a year. So if you increase the sows from 2500 to 2672 you will be increasing the number of pigs the cafo is producing. Increasing the size, waste and spreading output of the operation. This would violate *Regulation 5.901 (d) A permit renewal, permit modification or new permit issued pursuant to Reg 5.901 shall not increase the number of swine at a facility.*²

December of 2013 after beginning operation in June, C&H Hog Farm's lagoon's were near pump down markers. They sought a winter nutrient management plan to apply³. This was a winter day and yet application was made to field 15 where all plants were dormant.

The 2013 annual report⁴ states they had 2160 swine over 55 lbs and 1289 under 55 lbs and produced 2,786,908 gallons of waste. To change the calculations would err the storage needed in the lagoons requiring more waste application and create more runoff to the streams when plants are dormant.



The turbidity of Big Creek entering the Buffalo National River is apparent in this upper photo.

¹ https://www.adeq.state.ar.us/downloads/WebDatabases/PermitsOnline/NPDES/PN/ARG590001_Modification%20of%20NMP_20140218.pdf

² https://www.adeq.state.ar.us/regs/files/reg05_final_150918.pdf

³ <https://www.adeq.state.ar.us/water/bbri/c-and-h/pdfs/2018-09-17/Deposition%20Hancock%20with%20Exhibits.pdf>

⁴ https://www.adeq.state.ar.us/downloads/WebDatabases/PermitsOnline/NPDES/PermitInformation/ARG590001_2013%20Annual%20Report_20140127.pdf

The photo on the right is of the increased algal bloom and periphyton on the Buffalo River stream bottom downstream of the hog CAFO.

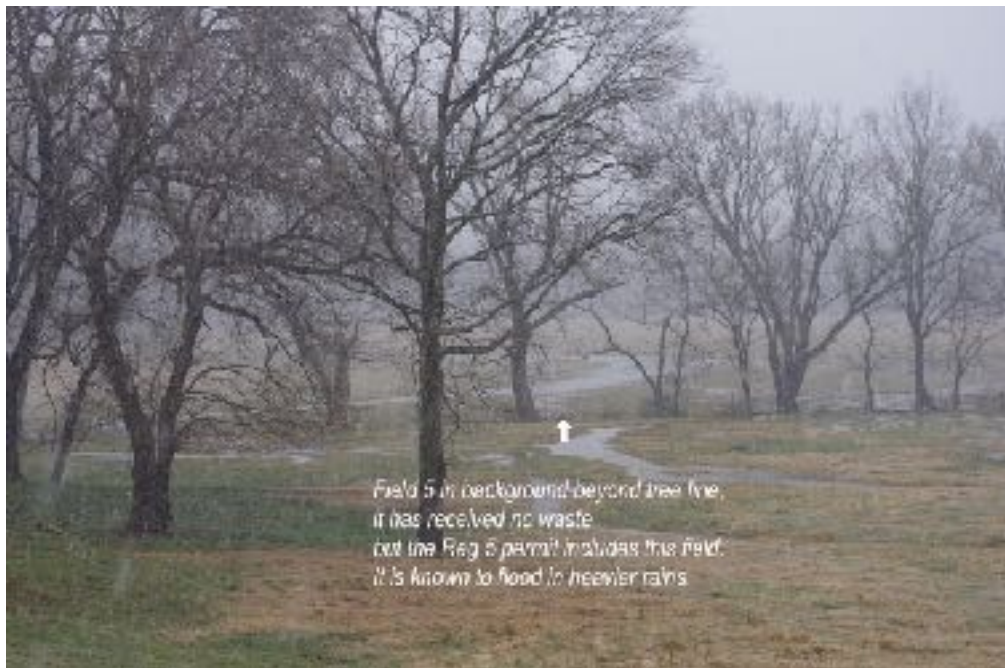


Honey Wagon's (waste hauler trucks) utilize state highways to get to spreading fields around the county. No placards or license or owner information is on these trucks.



For future consideration this photo shows rainwater flow across Field 5. There is no mention of 'highly erodible land conservation and wetland conservation' (HEL) included with the nutrient management plan but I think this is extremely important to be added so that fields that are already under contract are declared and the NM Planner can adjust for phosphorus and nitrogen runoff. Since the USDA Farm Service Agency may have made determinations on many of these permitted fields it would be a

good practice to include this in the NMP.⁵ In NM planner Monica Hancock's deposition it appears little is known or translated to a NMP about karst, highly erodible lands or excess phosphorus. This is disastrous to high quality waters due to excess algae growth by the runoff.



Field 5 in background beyond tree line, it has received no waste but the Reg 5 permit includes this field. It is known to flood in heavier rains

⁵<https://www.adeq.state.ar.us/water/bbri/c-and-h/pdfs/2018-09-17/Deposition%20Hancock%20with%20Exhibits.pdf>

Please also take into consideration that C&H Hog Farm is a corporation, not an individual therefore it is important to have disclosure information.

There are many technical reports in the 'Additional Information' under the 5264-W permit information. Many of these reports verify the leakage of the lagoons and the addition of nutrients to Big Creek and the Buffalo River. I will not list them but provide footnote access to their location.⁶

I continue to believe we have common goals to provide a future for generations continuing enjoyment of the Buffalo National River as designated by Congress in 1972. Agencies and citizens have become complacent to the importance of preserving previous environmental standards that it takes to maintain high quality waters when money drives the heart. The untold state and local \$'s spent on this one cafo since the permitting of ARG590001 will continue to rise as the waters of this state continue to be contaminated with the excess phosphorus runoff for years to come.



Let this be a lesson that we remember and don't hesitate to implement standards to be more environmental than standards that allow degradation to our streams and soils leaving behind superfund sites that can't be undone.

I will attach my previous comments and concur with Jessie Green, White River Waterkeeper, Buffalo River Watershed Alliance, the Ozark Society, NPS, John Murdoch, Van Brahana, Ray Quick and many others for the denial of this permit.

Sincerely,
Carol Bitting
HC 73 Box 182A
Marble Falls, Ar 72648

⁶<https://www.adeq.state.ar.us/home/pdssql/p-additional-information-5264-w.aspx>

To ADEQ,

06/02/2016

In reference to a Regulation 6 General Permit #ARG590001 requesting Regulation 5 individual permit under #5264-W I would like these comments to go on record.

The ARG590001 permit was placed in a newspaper in Pulaski County under a name unknown to any local or Arkansas resident, this permit went unnoticed by Newton County residents and most Arkansas taxpayers. There was no mention of the Buffalo National River (BNR) and no mention of Big Creek. Only a few ADEQ staff & a few residents were aware of the filing of this large confined animal feeding operation application in Mt. Judea, Ar.

Now that C&H has been in operation under a National Pollutant Discharge Permit and is up for renewal they have asked for an individual Reg 5 permit with no renewal attachments. Regulation 5 permits at the time of the original filling had a much more stringent public notice requirement than the Regulation 6 General Permit. This regulation has since been revised to include more stringent notification, but only after a large cafo was permitted in the BNR watershed.

The ARG590001, NPDES permit is under the federal supervision of the Environmental Protection Agency as well as the state supervision, Arkansas Department of Environmental Quality . This cafo with its high potential to pollute water was placed on karst in the watershed of the First National River, an Extraordinary Resource Water, therefore surveillance should be at the highest level to protect the waters of this state described in Regulation 2.

C&H Hog Farms, ARG590001, by design and all visual appearances is discharging into the waters of this state. The lagoons, as so stated, are allowed to leak according to the NPDES permit over 7,000 gallons daily. Due to this discharge factored into the original permit and no proof there is not leakage, C&H owners are knowingly discharging while seeking a Regulation 5 "no discharge" permit.

The presence of a large swine cafo in a tributary to the Buffalo National River with funding from the state of Arkansas (BCRET) to monitor the impacts to the Buffalo River has shown that Big Creek is impaired for e-coli and the USGS & NPS data show Big Creek is impaired for dissolved oxygen (see data presented to ADEQ prior to the State's 303-D impaired waters listing by the NPS & BCRET). Due to the visual appearance of Big Creek and the BCRET, NPS and USGS data results it appears there is discharge into the streams, springs and waters of the state. I ask you to deny this application change to a Regulation 5 individual permit due to discharge and or the lack of evidence they are not discharging.

If ADEQ director, Becky Keogh, approves this new application of a large confined animal feeding operation in the Buffalo River watershed I request a public hearing.

Sincerely,
Carol Bitting
HC 73 Box 182 A
Marble Falls, Ar 72648

From: [McWilliams, Katherine](#)
To: [Deardoff, Amy](#)
Subject: FW: ARG590001_5264-W
Date: Monday, June 06, 2016 8:29:56 AM
Attachments: [ARG590001_5264_W Comments.pdf](#)

5264-W

Thanks.

From: McWilliams, Clark
Sent: Friday, June 03, 2016 7:30 AM
To: McWilliams, Katherine
Subject: FW: ARG590001_5264-W

From: Carol Bitting [<mailto:lcbitting@gmail.com>]
Sent: Thursday, June 02, 2016 8:22 PM
To: McWilliams, Clark
Subject: ARG590001_5264-W

Katherine,

Please find attached my comments to the request for a new swine application in the Buffalo River Watershed. Let me know if you have trouble opening the attachment.

Carol

We will Win, or We ALL LOSE....Save the Buffalo River Watershed.

Katherine McWilliams
Engineer Permits Branch, Office of Water Quality
5301 Northshore Drive
North Little Rock, Ar 72118-5317

April 4, 2017

In Reference to ADEQ's Draft Decision to Approve C&H Hog Farm Application Permit 5264-W; AFIN 51-00164,

We, citizens, have submitted many expert reports and comments since ADEQ permitted this point source large confined swine feeding operation in the Buffalo River Watershed with no public notice, without informing the National Park Service, Arkansas Game & Fish or the National Forest Service of the General Permit of 2012, without stream data TMDL's or even mention of Big Creek or the Buffalo National River and without utilizing the permit designed for these type of operations, such as the NPDES Individual CAFO Permit.

There is nothing like hogs stinking up the scenic beauty of the sensitive area of the Buffalo River or Big Creek Valley, where Sam's Throne, a popular natural climbing area is located, resort cabins, a community store, restaurant, a school, churches, rural homesteaders and one of Arkansas' curviest roads (a favorite to motorcycle riders). Nor is there anything that quiet describes the community's lack of confidence at speaking out due to intimidation and close relations.

There is nothing like flies covering the eves of houses and puking in the mornings as you try to tend to your chores. How about the asthma illness' and the kids who have to go outside on the playground while hog waste is being spread around their school? Have you heard one classmate to another say, "hogs are stinking up the air?" What about a comment made by a teacher to her students when they remarked the hogs stink and they can't stand to play outside, "that's the smell of money"? Whose going to tell those children that C&H and ADEQ have now permitted fields in all directions of the school, not just south and west? Whose going to tell those children the headaches, runny noses, asthma and illness' they experience are creating immune issues that will slowly break down their health?

Whose going to tell the children the Buffalo River is no longer a place to swim or fish and that recreation is limited to staying out of the water and throwing back your catch? This year I was on a canoe trip, two days into the trip my husband and I both became extremely ill. In our 25 years together we have never been so ill nor have we ever had the same issue at the same time. We both believe we contracted something from a swim at a favorite spring below Big Creek, possibly we licked the water from our lips and exposed our systems to "rage". I also received a phone call from a high school friend telling me of 2 of their youth whom on a June, 7 day Buffalo River canoe trip became so ill they still don't know if both will survive. How many others are out there we don't know of? No agency wants to tell the public the Buffalo River is a hazard and that 6500 hogs (equivalent to a 15,000 town of people) waste is being applied to thin soils with rapid transport to the streams, creeks, wells and aquifer of this state. No one wants to take responsibility, do you?

The April 4, 2001 report by Dr. William Weida, Department of Economics, the Colorado College, Colorado Springs, CO Nutrient Management Problems defines many of the issues with stream and groundwater near cafo's.

"The pathogens present in hog manure are not found in inorganic chemicals. These pathogens could be transported to ground water supplies through improperly sealed wells or other naturally occurring pathways. Studies released since 1999 have found that:

- (a) *Swine herds are a potential animal reservoir for Swine Hepatitis E Virus and this virus is present in fields to which manure has been applied and in water waste from these fields. Swine Hepatitis E Virus may persist in the environment for at least 2 weeks and possibly longer.15*
- (b) *(b) A broad profile of chemical and microbial constituents are present in both ground and surface water proximal to large-scale swine operations--chemical (pesticides, antibiotics, heavy metals, minerals, and nutrients) and microbial (Escherichia coli, Salmonella sp., Enterococcus sp., Yersinia sp., Campylobacter sp., Cryptosporidium parvum) contaminants were present.*
- (c) *Antibiotics are present in waste generated at confined animal feeding operations and may be available for transport into surface and ground water.17*

These data directly contradict the contention the risk of groundwater contamination from hog manure is no different than that from inorganic fertilizer. In fact, the use of animal manure for fertilizer carries with it not only all the contamination issues associated with inorganic fertilizers but also a large number of additional pollution and health concerns.

Hog waste from a large confined feeding operation is a waste application permit. Hog and humans can transfer bacteria and pathogens back and forth. Applying more than the agronomic amounts results in scours in calves and even death of the animals, kidney and liver failures, weedy fields, excessive nutrient runoff (Reg 5.303), and algae growth in streams, loss of aquatic life such as the small mouth bass, muscels, and insects that bats and fish feed upon.

Here (Photo on right) below Gilbert the waters are choked with algae on the impaired stretch of the Buffalo River. The algae was reported for over 30 miles of river. I witnessed at 11.



ADEQ did you take the endangered species into account? After all the lagoons are still permitted to leak and there is a Gray Bat maternity cave near the mouth of Big Creek on the Buffalo River. There are Indiana Bats on Left Fork Big

Creek and scattered throughout the area. The cave above is a Gray Bat maternity colony site and a positive dye trace to the spreading fields of C&H Hog Farm. (Brahana Dye Study 2014).

Regulation 2.201 states: Existing in stream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected. I have seen no data verifying this is being maintained on the contrary the opposite appears true. Can you please verify this regulation is upheld.

Note the Regulation 5 permit plan and review dated September 1, 2015, by engineers. In a karst environment many things can happen. Did you check the pits below the pigs for leakage? Is there any way to determine if the concrete lined pits are leaking? Can you please list all other ADEQ employees and their qualifications whom reviewed this permit? It appears very minimal for Regulation 5 in karst geology.

There is no plan for spills yet the terrains are steep, roads are windy and narrow crossing many tributaries, sink holes with heavy laden fast moving trucks in a hurry to get the next load of waste dumped. Very important is the financial ability of C&H to support a disaster in the event of "at fault accidents".

There is no consideration for the tourist whom are seen wandering the National Forest sightseeing or hiking. Nor economic considerations for the many whom make a living from rental property.

The proper procedures for a Regulation 5 permit are stated on the ADEQ website https://www.adeq.state.ar.us/water/permits/pdfs/reg_5_permit_procedures.pdf

Page 6 of the Statement of Basis; ADEQ left out the following sources for proper permitting procedures. Why weren't the following used for this permit in a most sensitive karst environment and the First National River, an Outstanding Resource Water with the highest protection, when they are included in proper permitting procedures? <https://www.adeq.state.ar.us/water/permits/nodischarge/individual.aspx>

Here are 4 of the sources that are omitted from proper permitting procedures;

- APC&EC Regulation 2,
- The USDA Natural Resources Conservation Service Technical Publications
- (a) Field Office Technical Guide and
- (b) Agricultural Waste Management Field Handbook

Omitted under part 3 Technical Requirements

- 3.a,
- * each field should have distance to stream and highways, each stream should be named and marked for easy reference to the waterways
 - * A permit with this liability should have a topo map that is readable

Page 5, Operation and Maintenance, Land Management, Spreader Calibration , Soil & Swine Fertilizer Sampling the word fertilizer has been substituted for manure or waste application. This is a waste application permit, not a fertilizer permit. Hog manure from a concentrated animal operation is waste management.

Regulation 5.201 defines the “Waste Management Plan means a plan prepared by the United States Department of Agriculture Natural Resource Conservation Service (NRCS), an Arkansas Natural Resources Commission water quality technician, the University of Arkansas Cooperative Extension Service, or a professional engineer registered in the state of Arkansas detailing the management and disposal of liquid wastes generated in a confined animal operation.”

Why have you changed the wording to fertilizer? it is liquid animal waste, so operation and maintenance section is unacceptable and the permit should be denied. The operator cannot manage proper calculations of waste when the Nutrient Management Plan has been altered beyond acceptable definition. There are up to 6500 hogs living within the confines of 2 buildings. This is waste management. Reg. 5.301 states, No confined animal operation using a **liquid animal waste disposal system** shall be constructed or operated unless the owner has first obtained a permit from the Department. Please explain to the operator the difference in fertilizer and waste management and the health conditions related to waste verses fertilizer. This facility and spreading fields are rock throwing distance to a community and school.

NMP Section 1, page 5; Soil & Swine Fertilizer Sampling Soil samples are to be taken once every five years or **when the nutrient management plan is revised**. Dated 3/2/2016 by Monica Hancock and signed by engineers Pat Bass and Dennis Carmen.

Soil samples once every 5 years for a permit in the watershed of an ORW? C&H ARG590001 is required to sample yearly, these samples are not available and many of the fields are dated 2014. These are outdated for an NPDES permit and a large CAFO in the Buffalo River watershed and outdated for a Nutrient Management Plan dated 2016. Will you continue to permit a large cafo that is already out of NMP compliance with their permit? Again this appears C&H has been allowed a modification not a new permit and the oversight of the industrial hog factory is to lax.

In an inspection by Jason Bolenbaugh dated 1/23/2014, owner, Jason Henson is reminded **soil samples for Nitrate-N and Phosphorus shall be taken no less than annually**. <https://www.adeq.state.ar.us/downloads/WebDatabases/InspectionsOnline/075752-insp.pdf>

Per Section B.3.c.4 of your NMP, soil samples for Nitrate-N and Phosphorus shall be taken no less than annually. This differs from Part 4.2.1.3 of your permit. Please ensure you continue to abide by the requirement of your NMP.

D Section 651.0201(d) of the AWMFH states:

“If wastes are applied to agricultural fields, the application must be planned so that the available nutrients do not exceed the plant’s need or contain other constituents in amounts that would be toxic to plant growth.”

It is apparent there is a problem when you look at the 2016 Annual Report and you see that 15 of the 17 C&H soil samples are above optimum and the waste is still being spread on them. This is a violation of the Regulation 6 NPDES permit.

https://www.adeq.state.ar.us/downloads/WebDatabases/PermitsOnline/NPDES/PermitInformation/ARG590001_2016%20Annual%20Report_20170126.pdf

Below are excerpts from the NMP prepared by Monica Hancock for the Regulation 5 permit.

NMP dated 3/2/2016 by Monica Hancock Section 1;

Soil and Swine Fertilizer Sampling states, "Soils samples are to be taken once every 5 years or *"when the nutrient management plan is revised."*

Looking through the soil samples I see outdated soil samples such as

Field JH 1, JH 4 JH 2, FD11, CC 13, CC13A, CC13B, C1C15B, BH16,

is dated 12/04/2015 and *above optimum for P & K*

Field CC 3, EGC7, CH35, CC8, CC8A, CC9, CC9A, FD10, BC10A, RF 12, CC 14, C1C15, JC 17, GN23, HC32, HC33, RC34 is dated 12/04/2015 and *above optimum for P*

Field GR 5, RC20, EGC7A is dated *04/01/2014* and above optimum for P (*definitely outdated*)

Field SR 6, GR 6A is dated *04/01/2014* and above optimum for P & K (*definitely outdated*)

Field CH36, dated 12/04/2015; above optimum for K

Field C1C15A, MB1B, MB19, RC21, RC21A, RC21B, KC22, DH24, is dated *04/01/2014* (*outdated*)

According to C&H NMP dated 5/24/2012 B. Nutrient Utilization Plan Page 3 (3) a. Composite base-line soil test will be taken at least annually. See page 43-83 of 5264-W permit for outdated soil test.

Section 2 ; Application for Regulation 5 Permit Engineering Plans and Review Sept 1., 2015;

I could understand an engineer would be needed to go over the building plans, but when it comes to application fields I would think ADEQ would request a geologist and with the sensitive nature of this CAFO in the Buffalo River Watershed I would expect a hydrogeologist, the best in the state. I would also expect that Regulation 2, and Regulation 22 would be taken into account due to the karst terrain and high probability of fast transport of pollutants to the Buffalo River. There is no mention of the karst terrain presented in the ERI by BCRET that identify field 5 and 12 karst. I did not find any reference to the leakage allowed by the lagoons and due to the low permeability of the lining feel this should have been explored more thoroughly. BCRET and ADEQ have had time to install and require monitoring of the daily levels of the lagoons, yet when requested, this information is unavailable. One bore hole, again, is below standard.

At the time of the inspection you could not verify the exact number of swine on site that were above 55 lbs. and below 55 lbs. On January 27, 2014 you confirmed there were 2,499 sows (> 55 lbs.) and 700 nursery pigs (< 55 lbs.) on site. Your NMP states there will be no more than 2,500 swine (> 55 lbs.) and 4,000 swine (< 55 lbs.) on site. Please ensure you are maintaining an actual head count at all times so you do not exceed the given number of swins.

Page 6, 2nd paragraph increases the number of boars and sows and violates Regulation 5.901 (d) A permit renewal, permit modification, or new permit issued pursuant to Reg. 5.901(C) shall not increase the number of swine permitted at a facility.

2012, ARG590001 design calculations section C2 (b) to determine minimum storage requirement it is the sum of the animal waste produced, plus the spillage and wash water, plus the pit recharge produced in 180 days.

These following figures are estimates not exact numbers, but if these were accurate you would see this permit increases the sows, boars, pigs and the number of pounds of hogs raised at C&H over the year increasing waste production.

ARG 590001 NMP Section C2: Design Calculations Waste Production A. (3) 3 boars @ 450 lbs, 2,100 Gestating sows @ 375; 400 lactating sows @ 425 lbs, 4,000 pig @ 10 lbs

ARG 5900001 weekly average of hog weight by annual report 2012-2016 = total hog # ÷ 4 years = average # × pounds = total hog weight

boars 3 @ 450 = 1,350.00 pounds of hog weight
 Gestating Sows 2011.75 @ 375 = 754,406.24 pounds of hog weight
 Lactating Sows. 400 @ 425 = 170,000.00 pounds of hog weight
 pigs 856 @ 10 = 8,560.00 pounds of hog weight
 total 934,316.25 total hog pounds a week

5264-W (Regulation 5 revised, modified numbers)

boars 6 @ 450 = 2,700
 Gestating Sows 2252 @ 425 = 957,100
 Lactating Sows 420 @ 400 = 168,000 weight has decreased by 25 lbs per hog in 2016 NMP
 pigs 750 @ 14 = 10,500 pounds (permit states average 1,500 shipped weekly) this figure was Section 2 P. 6.
 total 1,138,300 weekly hog pounds for 5264-W

This is a difference of 203,983.75 pounds of hog weight per week increase. With lagoon and nutrient management plans relying on hog weight for calculations this will increase the waste output and the storage limits and increase the need for more application fields. This will also increase the impact to the water quality by increasing the output on the already phosphorus saturated fields.

I also would suggest refiguring the pig output. If 2,412 sows produce an average of 856 pigs weekly over 4 years then 2672 sows (an increase of 260 sows a year at the facility) will increase pigs, not reduce them as written in this permit. Will you please explain how you came about reduced figures by increasing sows and boars?

ARG 590001 Section C2; Design calculations "Liquid manure storage is measured by unit waste production (UWP) in cubic feet per day per 1,000 pounds of animal"

Do you see anything in my calculations or reasoning that appears wrong or that there will be less waste due to increase in sow numbers? When sows and boars are increased pigs are increased. The average number of pigs in the last 4 annual reports average 856 yet 5264-W states only 750. Can you clarify this for me?

I could find no water quality TMDL's for Big Creek or water quality data referenced for permitting of large cafo in already impaired stream (Big Creek) as per documents from list in the public comments for the 303 (d) listing. These agencies including NPS, USGS, and BCRET data show Big Creek to be impaired. Regulation 2.201 states Existing in stream water uses and the level of water quality necessary to protect the existing uses shall be maintained. Regulation 2.30 states....any stream with watersheds of greater than 10 mile square are designated full body contact. Reg 2.301 states....**the criteria to protect the most sensitive use shall be maintained.** Reg 2.304the department may require an evaluation of all practicable alternatives to the project including; an environmental assessment of the impacts of each alternative, an engineering and economic analysis and a socio-economic evaluation of the project in the local area. Dr. Sharpely's study may not be completed until 2019 but that doesn't have anything to do with Regulations and the permitting of C & H Hog Farms. Dr Sharpely's BCRET study has already shown increased e coli and nitrates since the permitting of C&H. The trends have already been done by ADEQ.

Condition #27 page 4 of part 2, states minor modification with Reg 5.306 can incorporate all fields that are permitted to receive waste from the permittee. Does this mean that the *EC Farm fields that are in appeal are allowed to be a minor modification? Does it mean the missing field numbers are permitted and going to be allowed as minor modification? What exactly does this mean? We saw that EC Farms added 600 plus acres stating they were being pro active with the environment and sidestepping all the requirements of a new permit and now we see the language built into C&H's permit. This doesn't take into account the publics point of view and shows ADEQ to be capricious and arbitrary presuming the outcome of the appeal or another plan unbeknownst to the public.*

Condition #28; "alterations to the design, plans or specifications may be approved as a minor modification in accordance with Reg 5.306". Here it appears ADEQ has other plans to make modifications to this permit prior to its approval and are predetermining the need to modify C&H Hog Farms again. This information has not been released for public review and to preset conditions not allowing for public participation is capricious and arbitrary.

A Regulation 5 permit is a non point source permit. EPA definition, "**Non point source pollution** generally results from land runoff, precipitation, atmospheric deposition, drainage, seepage or hydrologic modification. Non point source (NPS) pollution, unlike pollution from industrial and sewage treatment plants, comes from many diffuse sources. NPS pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters and ground waters. How can ADEQ even consider allowing this when downstream impairment exist?

I am not stating I am in agreement with either permit, I am not. This is the wrong place for an industrial operation of hogs and this factory should be denied any permit in the Buffalo River watershed. Unless this is done the continued trespassing on the community and the nation will continue.

According to the EPA under definition of non point source it says, States report that **nonpoint source pollution** is the leading remaining cause of water quality problems. The effects of non point source pollutants on specific waters vary and may not always be fully assessed. **However, we know that these pollutants have harmful effects on drinking water supplies, recreation, fisheries and wildlife."**

The term "non point source" is defined to mean any source of water pollution that does not meet the legal definition of "point source" in section 502(14) of the Clean Water Act. That definition states:

The term "**point source**" means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, **concentrated animal feeding operation**, or vessel or other floating craft, from which pollutants are or may be discharged.

40 CFR 122.23 Discharge of a pollutant means: a) Any addition of any "pollutant" or combination of pollutants to "waters of the United States" from any "point source,"....

C&H discharges waste to a pipe, where the flow creates a surface water of over 1 acre called lagoons or ponds, these lagoons collect rainwater as well as piped hog waste from the barns, they then use a pipe to remove this waste to a tank truck where it is then spread via pipes over sink holes and thin sandy gravelly soils, with discrete fissures to waters of the state. There is no natural animal to ground transport of the waste, all the waste is manipulated from the time it leaves the animal body. See Waste Management Plan requirements <https://www.adeq.state.ar.us/water/permits/nodischarge/individual.aspx>

The terms of point source includes every means that C&H uses to get the waste out of its lagoons and transferred to fields and by discrete fissures to the waters of the state. In a karst environment unless you do a full ERI study of all application fields and rule out the presence of discrete fissures you must presume they are there.

In this email below the AHD and ADEQ know...."the system flushes well after a rainfall". Is this the reason for throwing out the storm flow data?

From: Terry Paul [mailto:Terry.Paul@arkansas.gov]
Sent: Friday, November 06, 2015 2:39 PM
To: Carpenter, Ellen
Cc: Bailey, John; Clem, Sarah
Subject: RE: Big Creek at confluence of Buffalo River

Mrs. Ellen,

It is pretty basic at this point but I am attempting to get ADH data assembled. The only thing really evident at this point is the system flushes well after a rainfall event. I will get that information over to Sarah in the next week, or as soon as I can.

Thanks Again,

Terry Paul

In May of 2012 C&H applied for a General Permit, this general permit did not include public notification requirements that the Regulation 5 individual permit did at that time. May 10, 2012 Mr. Jason Sutherland of Forman, Ar #3604-WG-AG-2 was told ADEQ would no longer reissue the General Permit and he was required to get an individual permit. This information is on the ADEQ website. On the ADEQ site the specific instructions still do not require state general permits to undergo the same notifications as a Regulation 5 permit. Public notification and interagency communications would have saved the C & H Hog Farm owners, the state and all stakeholders many millions of dollars. This permit should be denied as the public was unable to participate in the permit at that time and it appears to be treated as a modification not a new permit at this time.

In accordance with APC&EC Regulation 8.204 (B) all applicants for the issuance (new, Modification, and renewal or transfer of any permit under the environmental law of Arkansas shall submit a "Disclosure Statement" to the Department. This one is blank and due to a new permit and the risk involved why isn't this section completed? There were millions of dollars borrowed against the facility in 2012 see Farm Service Agency and Small Business Association documents. There may be other debts accumulated over the last few years. One stipulation is the full name and business address of any legal entity in which the applicant holds a **debt** or equity interest of at least 5% or that is a parent company or subsidiary of the applicant and a description of the ongoing organizational relationships as they may impact operations within the state; https://www.adeg.state.ar.us/ADEQ_Disclosure_Statement.pdf

Reg. 5.102 's purpose is to establish the minimum qualifications, standards and procedures for issuance of permits for **confined animal operations** using liquid animal waste management systems within the state and for the issuance of permits for land application sites within the state. By definition from Reg 5 C&H Hog Farm is a CAFO. A CAFO requires an NPDES permit because it is a point source pollution.

40 CFR 122.23

(a) Concentrated animal feeding operations (CAFOs), as defined in paragraph (b) of this section or designated in accordance with paragraph (c) of this section, are point sources, subject to NPDES permitting requirements as provided in this section. Once an animal feeding operation is defined as a CAFO for at least one type of animal, the NPDES requirements for CAFOs apply with respect to all animals in confinement at the operation and all manure, litter, and process wastewater generated by those animals or the production of those animals, regardless of the type of animal.

Could you please tell me where fields 25 thru 31 are? and or explain the skip in numbering?

Page 3 of Part II; Condition #22, whose going to ship waste and are there specific requirements for shipping waste? Is C&H qualified to ship waste? Would specific skills be needed for shipping waste? Can this waste be shipped out of the County? State? Country? What type container should hog waste be shipped in? Is there a specific placard for the shipping container? Would you please expand an explanation of what this means. Regulation 22 might need to apply here.



Condition # 26. It doesn't appear that the past has made facilities more responsible with time. In fact facilities such as these become outdated quickly. To allow less observation and frequency of monitoring with time seems backwards. Can you explain how with years there will be less likely hood of pollution and levee breaching? See the ADEQ study done in the 1990's that explains the problems with older facilities and lagoons that were full of solids that no longer held the liquid waste but it flowed over the levees into the streams.

Condition # 27. Could you elaborate? How can ADEQ submit a minor modification proposing to add fields to this permit? Wouldn't it be more proactive to do that now? Why would a permit already be requesting modification? Is there a known problem already? Are you considering EC Fields or are they the missing numbers 25-31? This condition should be struck from the permit. Regulation 5.302, Regulation 5.305 and Regulation 5.306 should be cited here not a predetermined minor modification. I object to any approval of unknown modifications.



Condition # 28. If ADEQ is already expecting this permit appealed does it seem that the agency should rethink the permitting of a large swine cafo in the Buffalo River watershed? Is the agency taking the public comments and expert reports and the water quality criteria into consideration? Has the department predetermined it is going to approve this permit regardless of any and all scientific data, public resistance, or recommended council? Please supply answers.

Page 2 Part III, 5. Be sure Oil and Hazardous Substance Liability pertains to this permit. I'm not sure about oil but if you consider hog waste hazardous then we need to include that in the transportation of hazardous substance. If a disclosure statement is included a better determination is whether C&H is financially or mechanically responsible to handle a crisis of a hazardous substance. I think it important to note CDL's, spill training, qualifications, etc. Will you please explain?

#10 (A) Are all these facilities located at these coordinates Latitude 35 55' 30.47"N Longitude 93 4'18.42"W?

#11 This is a no discharge permit....there is no discharge not even a 25 year 24 hour storm event, neither can there be any pollution from application fields. ADEQ considers runoff from application fields as pollution. See full answers under ADEQ's General Permit Fees_Economic_Impact_Environmental_Benefit_Analysis.pdf Below is an excerpt:

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

NPDES permitting for CAFOs will require the CAFOs to implement waste management practices that reduce the amount of pollutants that may enter waters of the State from waste storage and land application.

#12 Discarded or land applied? I'm not sure this is what you mean. Could you please define "removed substances" as relating to a waste management plan? This condition starts off with "solids removed" and Regulation 22, page 1-8 under *solid waste* definition includes "agricultural operations". According to definition of Liquid Waste Management System in Regulation 5 chapter 2; Definitions it means a system used for the collection, storage, distribution or disposal of **animal waste in liquid form** generated by a confined animal operation. ARG590001 states Condition 7.6 of the permit does talk about removed substances but I can only assume somewhere there are management practices to follow, here are from

previous ARG590001 permit. *Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of waste waters shall be disposed of in a manner such as to prevent any pollutant from such materials from entering the waters of the State. Written approval for such disposal must be obtained from the ADEQ Director, unless management of the material is contemplated by the Nutrient Management Plan.*

#13. In a karst terrain 24 hours could be too late to capture the pollutant from making it to the streams. Spills, leaks, or any discharge must be handled immediately. See Terry Paul, ADH comment “The only thing really evident at this point is the system flushes well after a rainfall event.” See Arkansas State Geology road guide for description of the area of Big Creek and surrounding spreading fields. <http://www.geology.ar.gov/pdf/Roadside%20Geology%20Series%2001.pdf> The Confederate Fault may help understand why the section of the Buffalo River is impaired at Tyler Bend. See <http://buffaloriveralliance.org/resources/Pictures/scanned%20reprints%20GWSW%20Big%20Creek%20karst.pdf> also; <http://buffaloriveralliance.org/resources/Pictures/Brahana%20JAAS%20Article.pdf> See Regulation 5.402, Chapter 7, Part 651-Geologic and Groundwater Considerations

Did you know in 2008 there were two Segments of the Buffalo River impaired for water quality? ADEQ is using the 2008 data and these segments are downstream of C&H 21 miles by river and 18 miles by air. This segment is shown here in these 2016 photos as impaired.

In the inpress, 2017 USGS Scientific Investigation report “Utilizing Fluorescent Dyes to Identify Meaningful Water-Quality Sampling Locations and Enhance Understanding of Groundwater Flow Near a Hog CAFO on Mantled Karst—Buffalo National River, Southern Ozarks Dr. Brahana states, “One positive trace to Mitch Hill Spring on the opposite side of the Buffalo River from injection reflected how complex the karst flow system is and how far flow from the study area could be measured. “

Here a map showing injection at BS36 and dots at positive dye receptors within the Buffalo National River. The spreading fields surrounding this injection are the most heavily spread. The red line indicates 11.4 approximate miles to Woolum from injection. I have only noted 4 receptors and of these, 3 are springs.

From Woolum (green dot at end of red line) to Tyler Bend Campground is less than 9 miles. It would be easy to visualize the fast transport of swine waste downstream and through underground conduits, settling in the deeper pools downstream as the finer particles are absorbed by the rocks and soils creating breeding grounds for pathogens, over loading of nutrients and algae blooms such as last summer.



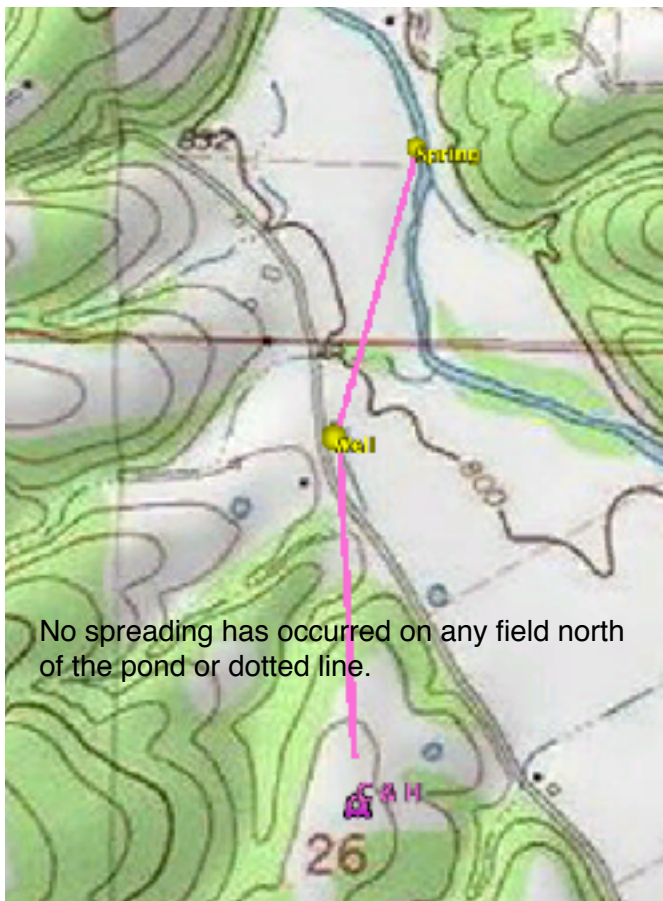
303(d) water body – Under section 303(d) of the 1972 Clean Water Act, states, territories, and authorized tribes are required to develop lists of impaired waters. These impaired waters do not meet water quality standards that states, territories, and authorized tribes have set for them. The law requires that these jurisdictions establish priority rankings for waters on the lists and develop TMDLs for these waters.

Specifically stated in Regulation 2.203; Outstanding Resource Waters, Where high quality waters constitute an outstanding state or national resources, such as those waters designated as extraordinary resource waters, ecologically sensitive or natural and scenic waterways, those uses and water quality for which the outstanding waterbody was designated shall be protected by (1) water quality controls (2) maintenance of natural flow regime, (3) protection of in stream habitat, and (4) encouragement of land management practices protective of the watershed.

The stream to the right is below C&H Hog Farm. It is below a plugged well that at one time was Mt. Judea's water supply until it was contaminated after dead hogs were thrown into a sink hole upstream. (prior dating to C&H) Big Creek goes dry and resurges just upstream of this photo. Above this area the closest spreading field is 6270 feet by Big Creek stream.



In 2014 Dr. Van Brahana put dye into a well (map below). The well is approximately 1,600' from C&H Hog Barns and approximately 1,600' from the spring it emerged in 31 hours later in Big Creek. The emergence of the dye was visually apparent under the ledge in the stream (see photo). 1,200' downstream of the spring is a deep pool and 1,200' further is another on Big Creek and both used for swimming.



BigCreek is considered a primary contact stream and flows into the campground at Carver on the Buffalo River. E coli monitoring results show Big Creek as impaired...

see C & H All data in the 2016 303 (d) impaired waters comments on theADEQ website. See 2013 Arkansas



Department of Health concern forpathogens such as e coli and cryptosporidium from the proposed land application sites..... https://www.adeg.state.ar.us/downloads/webdatabases/permitsonline/npdes/permitinformation/arg590001_adh%20comment%20letter_20130321.pdf

If C&H is given a Regulation 5 permit, a non point source permit, then according to the definition of non point source and the pollution increased risk of non point source and a karst topographical setting, along an Outstanding Resource Waterway and the first National River the potential for poor water quality will continue escalating.

In a recent interview of Dr. Andrew Sharpely, University of Arkansas states, **“you cannot expect cheap food and clean water at the same time”** <https://youtu.be/0lvkRwXpZYY>

The Buffalo National River is downstream of Dr. Sharpely’s, University of Arkansas, Division of Agriculture’s study of C&H Hog Farm in Big Creek.

To my knowledge the owners were not aware of the fragile ecosystem in which they have been raised and lived. They understand the beauty, the hunting, the easy availability to all the scenic sports they enjoy and wanted to work in their community, but they may not have had an idea of the impact they created or will continue creating without Dr Sharpely, ADEQ, Pork Producers & Farm Bureau showing them the facts. They have put their trust in these agencies and these agencies are at fault for allowing the continued degradation of the waters and the community by continuing to support the wrongful permitting of this cafo and not informing the owners and the community of the science that supports these statements of degradation.

One person in tourism told me if we don’t talk about it people won’t know. Does this mean if we ignore it, it will go away? I doubt it and I found the comment an insult to those whom I know that work so hard to keep this part of Arkansas for the enjoyment of all. I want people to come back or share a wonderful view of our beloved state and its people. We are the host to an industry that we the people of these counties along the Buffalo River have developed. We are responsible for the needs of the million plus visitors and the sensitive Buffalo River. It is our responsibility as residents to protect her having survived and built our own successful business’ with her influence. This market is open to everyone with initiative in the 5 counties that line her borders and we are the largest stakeholders. C & H and all stakeholders have shown that an industry such as the hog CAFO industry isn’t sustainable in this area. It is time to make decisions based on all facts.

The federal and state agencies have increased the wages of hundreds of county residents over the years and contributed to many added incomes and retirements. Those who live here sacrifice to live here. We treasure our solitude, the scenic beauty and we at times enjoy the simplest lives because we can. We are blessed and at this time we are battling our state and industry for what we know is the livelihood of millions of people and the future of a river. I can’t even imagine how many jobs or recreational values will be lost when the Buffalo River is no longer a river that is treasured for what Congress designated. I can’t imagine that the algae experienced last summer will choke the life out of all her miles. But I know that if the cafo’s of this state continue to haul their waste to the poor, rocky, hillsides and continue to force chicken and hog waste down her throat, she will suffocate and all the while ADEQ refuses to admit wrong doing ignoring the very value they represent as taken from their website **“The Arkansas Department of Environmental Quality (ADEQ) is the state's main environmental protection agency, charged with protecting, enhancing, and restoring the environment for Arkansans.”**

Sincerely,

Carol Bitting
HC 73 Box 182 A
Marble Falls, Ar 72648

The Difference Between Animal Manure and Inorganic Fertilizer

Statements that manure application by subsoil injection at agronomic rates has a risk of groundwater contamination that is no different than inorganic fertilizer ignore the non-nutrient content of animal manure. A large number of diseases are present in animal manure. These diseases are not present in inorganic fertilizers. Table 2 shows that the potential presence of 25 different diseases in animal manure make this form of fertilizer very different from the inorganic chemicals that are used as crop fertilizer.

Table 2, Diseases and organisms spread by animal manure

Disease	Responsible organism	Disease	Responsible organism
Bacterial		Viral	
Salmonella	Salmonella sp	New Castle	Virus
Leptospirosis	Leptospiral pomona	Hog Cholera	Virus
Anthrax	Bacillus anthracis	Foot and Mouth	Virus
Tuberculosis	Mycobacterium tuberculosis	Pituitary	Virus
	Mycobacterium avium		
Johnes disease	Mycobacterium paratuberculosis	Fungal	
	Brucella abortus	Coccidioidomycosis	Coccidioides immitis
Brucellosis	Brucella melitensis	Histoplasmosis	Histoplasma capsulatum
	Brucella suis	Ringworm	Various microsporium and trichophyton
Listeriosis	Listeria monocytogenes	Protozoal	
Tetanus	Clostridium tetani	Coccidiosis	Eimeria sp.
Tularemia	Pasturella tularensis	Balantidiasis	Balantidium coli.
Erysipelas	Erysipelothrix rhusiopathiae	Toxoplasmosis	Toxoplasma sp.
Colibacillosis	E.coli (some serotypes)		
Coliform mastitis	E.coli (some serotypes)	Parasitic	
Metritis		Ascariasis	Ascaris lumbricoides
		Sarcocystiasis	Sarcocystis sp.
Rickettsial			
Q fever	Coxiella burnetii		

6

Nutrient Management Issues

Source: Agricultural Waste Management Field Handbook, United States Department of Agriculture Soil Conservation Service, April, 1992, p. 3-13, 3-14.

The pathogens present in hog manure are not found in inorganic chemicals. These pathogens could be transported to ground water supplies through improperly sealed wells or other naturally occurring pathways. Studies released since 1999 have found that:

(a) Swine herds are a potential animal reservoir for Swine Hepatitis E Virus and this virus is present in fields to which manure has been applied and in water waste from these fields. Swine Hepatitis E Virus may persist in the environment for at least 2 weeks and possibly longer.¹³

(b) A broad profile of chemical and microbial constituents are present in both ground and surface water proximal to large-scale swine operations—chemical (pesticides, antibiotics, heavy metals, minerals, and nutrients) and microbial (Escherichia coli, Salmonella sp., Enterococcus sp., Yersinia sp., Campylobacter sp., Cryptosporidium parvum) contaminants were present.¹⁶

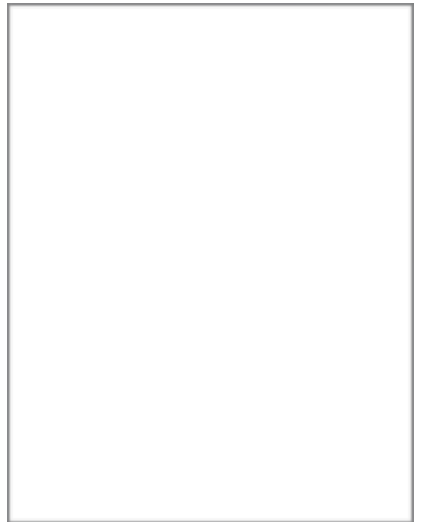
(c) Antibiotics are present in waste generated at confined animal feeding operations and may be available for transport into surface and ground water.¹⁷

These data directly contradict the contention the risk of groundwater contamination from hog manure is no different than that from inorganic fertilizer. In fact, the use of animal manure for fertilizer carries with it not only all the contamination issues associated with inorganic fertilizers but also a large number of additional pollution and health concerns.

As the populations increase so does man's demand on the resources. We can practice sustainability, but Dr. Sharpely does not have a sustainable plan for C & H Hog Farm or the owners. We do not need to feed the world, that is not our responsibility. One only has to consider what happens when there is no electricity, no water in the well, no antibiotics etc to know this is not sustainable.

Save the river...for the future of all generations.





From: [Carol Bitting](#)
To: [Water Draft Permit Comment](#)
Subject: [BULK] Permit 5264-W Comments
Date: Wednesday, April 05, 2017 11:31:29 PM
Attachments: [20170405 5264-W Carol Comments.pdf](#)

I have included my public comments as an attachment to this email. Would you please verify you have received them?

Thank you,
Carol Bitting



Katherine McWilliams
Engineer Permits Branch, Office of Water Quality 5301 Northshore Drive
North Little Rock, Ar 72118-5317

April 4, 2017

In Reference to ADEQ's Draft Decision to Approve C&H Hog Farm Application Permit 5264-W; AFIN 51-00164

I am using excerpts from my comment in the 2016 303 (d) impaired waters listing to be reviewed along with the C&H 5264-W Regulation 5 permit. This large swine CAFO has added degradation to the streams surrounding its spreading fields, including the photo above which is on Left Fork Big Creek near a spring that resurges and positive dye trace from a well near the C&H highly used spreading fields on Big Creek.

It appears ADEQ has lost sight of its goal to "*Protect, Enhance and Restore the Natural Environment for the well being of all Arkansans*". Over the years ADEQ has seen a departure of conscientious employees qualified to understand the duty the agency has to the citizens of Arkansas. Many people like myself were under the impression ADEQ was watching out for the environmental well being of our state. The nonchalant permitting of a large swine CAFO in the watershed of America's First National River, an Outstanding National Resource Water has placed tremendous burdens upon our state.

There are 3 streams the National Park Service has asked to be included and I recommend they be included. All three streams are greater than 10 square miles therefore are categorized as primary contact water within the Buffalo River Watershed. These streams are Mill Creek of Newton County, Big Creek of Newton County and Bear Creek of Searcy County. This region is within ADEQ's Integrated Water Quality Monitoring Assessment Report Section 305 (b) and 303 (d) of the Federal Pollution Control Act submitted biennial.

Page 373 states; In cooperation with the US Parks Service, approximately 60 monitoring stations on the Buffalo River, **its tributaries, and watershed springs** are routinely monitored. Page 31 states: Extraordinary Resource Waters (ERW) This beneficial use is a combination of the chemical, physical, and biological characteristics of a **waterbody and its watershed** which is characterized by scenic beauty, aesthetics, scientific values, broad scope recreation potential, and intangible social values.

Unless the watershed is included the Buffalo River cannot maintain Extraordinary Resource Waters (ERW), Ecologically Sensitive Waterbody (ESW) or Natural and Scenic Waterway (NSW) status.

I begin with Big Creek, Newton County due to ADEQ's permitting of an NPDES large swine CAFO on an already at capacity stream without use of documentation or historical stream data information. In other words you did not utilize your own research and data prior to the permitting of a General Permit. Below Regulation 2.304 states you must provide documentation that there will be **no degradation** to the Extraordinary Resource Water, Ecologically Sensitive Waterbodies or the Natural and Scenic Waterways. The NPS and USGS data report there has been degradation therefore you are in violation of state regulations and you have not provided proof that the permitted facility is not degrading the water of the tributary and the river.

Algae growth in Big Creek has continued to rise over the last few years with the increased application of millions of gallons of untreated waste. This waste is spread thru out the year even when there are no plants to uptake the nutrients. The lower 2 miles of Big Creek are within the boundaries of the National Park. The above photo of the stream choked with algae is 6 miles upstream Big Creek. Big Creek is impaired for dissolved oxygen according to USGS & NPS data, data you have been accepting since the 1970s.

According to Reg 2.30 (below) these streams are full body contact streams and therefore when sampling bacterial data from these streams during May 1-Sep 30 a geometric mean of 126 colonies per 100 ml is the standard.

These streams are within the watershed of the Buffalo National River and must be maintained as Reg 2.01 states to prevent the degradation of the Buffalo River.

Reg. 2.01 states; Existing in-stream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.

Reg 2.203 states; Where high quality waters constitute an outstanding state or national resource, such as those waters designated as Extraordinary Resource Waters, Ecologically Sensitive Waterbodies or Natural and Scenic Waterways, those uses and water quality for which the outstanding waterbody was designated shall be protected by (1) water quality controls, (2) maintenance of natural flow regime, (3) protection of in-stream habitat, and (4) encouragement of **land management practices protective** of the **watershed**.

Reg 2.30 (d)states; Primary Contact Recreation - This beneficial use designates waters where full body contact is involved. Any stream with watersheds of greater than 10 mile square are designated for full body contact.

Reg 2.301 states: Substantially all the waters of the State have been designated for specific uses as shown in Appendix A. In those instances where waters are classified for multiple uses

and different criteria are specified for each use, **the criteria to protect the most sensitive use shall be applicable.**

Below is a regulation that states you must provide documentation that there will be no degradation to the ERW, ESW or the NSW.

Reg 2.304 states; Significant physical **alterations** of the habitat within Extraordinary Resource Waters, Ecologically Sensitive Waterbodies or Natural and Scenic Waterways **are not allowed. In other waters**, where significant physical alterations of the habitat are proposed, the Department must be assured that **no significant degradation of any**

existing use or water quality necessary to protect that use will occur. In order to make such determinations, the Department may require an evaluation of all practicable alternatives to the project including: an environmental assessment of the impacts of each alternative, an engineering and economic analysis, and a socio-economic evaluation of the project in the local area.

ADEQ is empowered to enforce and administer all laws and regulations relating to pollution of the waters of the state and the Commission is authorized to promulgate rules and regulations relating to pollution of waters of the state. Ark. Code Ann. § 8-4-201. Because “waters of the state” include “...all bodies or accumulations of water, surface and underground...,” the Commission is authorized under state law to develop standards for the protection of groundwater.

Please add Mill Creek, Bear Creek and Big Creek to the 303 (d) impaired waters list. It is visibly and data apparent these tributaries are impaired due to some type of pollution within the watershed. The source of the impaired criteria does not come from the Buffalo River itself but from the tributaries that are the sources of the waters of the river.

It is very important when visiting an ERW with your children or immune compromised individual that people are aware when the water quality has degraded and harmful bacteria can enter the body causing kidney failure in young children or bacterial infections on the skin. Children love to splash and play in the water and they should not have to worry about raw sewage. They deserve the protection, the enhancement and the restoration of their environment.

I look forward to watching Arkansas become a leader in Environmental Quality. Not just a rubber stamped leader, but a real quality leader.

Sincerely,
Carol Bitting

From: [Carol Bitting](#)
To: [Water Draft Permit Comment](#)
Subject: [BULK] 5264-W 2nd Comment
Date: Thursday, April 06, 2017 7:26:35 AM
Attachments: [20170406 5264-W Carol Comments.pdf](#)

Please accept the attached comment letter to include as Comment # 2.
Thank you.
Carol Bitting

Mortality of Little Brown Bats (*Myotis lucifugus carissima*) Naturally Exposed to Microcystin-LR

Marcos Isidoro-Ayza,^{1,3,6} Lee Jones,² Robert J. Dusek,³ Jeffrey M. Lorch,³ Jan H. Landsberg,⁴ Patrick Wilson,⁴ and Stephanie Graham⁵ ¹Department of Pathobiological Sciences, School of Veterinary Medicine, University of Wisconsin, Madison, Wisconsin xxxxx, USA; ²Wildlife Health Office, Natural Resource Program Center, US Fish and Wildlife Service, Bozeman, Montana xxxxx, USA; ³US Geological Survey, National Wildlife Health Center, Madison, Wisconsin xxxxx, USA; ⁴Fish and Wildlife Research Institute, Florida Fish and Wildlife Conservation Commission, St. Petersburg, Florida xxxxx, USA; ⁵Field Office, US Fish and Wildlife Service, West Valley City, Utah xxxxx, USA; ⁶Corresponding author (email: isidoroayza@wisc.edu)

ABSTRACT: We describe a die-off of little brown bats (*Myotis lucifugus carissima*) associated with acute intoxication with microcystin-LR in 2016 at Scofield Reservoir in Utah. High levels of this cyanotoxin in water from the reservoir and gastrointestinal content of bats supported this diagnosis.

Cyanobacterial blooms are an increasing problem in natural and man-made aquatic habitats. Cyanotoxins such as microcystins produced during these blooms can result in human and animal intoxications (Valério et al. 2010). A mass die-off of bats (*Myotis* sp. and *Lasiurus cinereus*) exposed to high levels of the neurotoxin anatoxin-a in Alberta, Canada is the only reported cyanobacterial bloom-associated bat mortality (Pybus et al. 1986). More recently, Woller-Skar et al. (2015) detected microcystins in feces of apparently healthy little brown bats (*Myotis lucifugus*) from a roost in Michigan adjacent to a lake experiencing seasonal *Microcystis aeruginosa* blooms. Exposure of bats to cyanotoxins can be indirect, through ingestion of microarthropods harboring the toxins (Woller-Skar et al. 2015), or direct, by drinking contaminated water (Pybus et al. 1986).

Between 30 August and 1 September 2016, during sampling work conducted in relation to a cyanobacterial bloom at Scofield Reservoir, Carbon County, Utah, USA (39°47'21.4152"N, 11°7'45.8652"W), we found 27 dead and one moribund bat (*Myotis* sp.) scattered along 50 m of shoreline, within 5 m of the water. Several bats were covered in viscous, bright green scum consistent with cyanobacteria. For disease response, US Fish and Wildlife Service personnel humanely euthanized the moribund

bat by cervical dislocation. They then collected and refrigerated eight of the carcasses (including the euthanized bat) in individual plastic bags and shipped them overnight to the US Geological Survey–National Wildlife Health Center (USGS-NWHC), Madison, Wisconsin, USA for cause-of-death determination. The remaining carcasses were in advanced state of decomposition and considered unsuitable for postmortem examination.

On 29 August 2016, we collected and submitted water samples from six points of the reservoir to Region 8 Laboratory–US Environmental Protection Agency, Golden, Colorado, USA for cyanotoxin analysis (Table 1). Enzyme-linked immunosorbent assay (ELISA) for total microcystin detection yielded values between 22.2 to over 50 µg/L (report limit [RL]=1.5 µg/L). Subsequent congener-dependent quantification of cyanotoxins by liquid chromatography–tandem mass spectrometry (LC/MS-MS) yielded levels of microcystin-LR (MC-LR) ranging from 4.33 to 1,890 µg/L (RL=0.5 µg/L). Microcystin-RR was detected at low concentrations (0.13–17.5 µg/L, RL=0.05 µg/L) in four of the water samples. Microcystin-YR, anatoxin-a, and cylindrospermopsin were not detected (RL=0.05 µg/L for each cyanotoxin). On 31 August 2016, we collected and sent water samples from five points of the reservoir (including four of the areas previously sampled) to GreenWater Laboratories, Palatka, Florida, USA for total microcystin, cylindrospermopsin, and saxitoxin quantification using an ELISA with a broader range of quantification, which yielded microcystin levels from 14.4 to 60,000 µg/L (RL=0.15 µg/L) in every

TABLE 1. Total microcystin concentration ($\mu\text{g/L}$) by enzyme-linked immunosorbent assay, microcystin-LR and -RR concentrations by liquid chromatography–tandem mass spectrometry in environmental water, and microcystin-LR concentration in pooled gastrointestinal contents of five little brown bats (*Myotis lucifugus carissima*) found dead at Scofield Reservoir, Carbon County, Utah in 2016.

Sample	Microcystin concentration				
	$\mu\text{g/L}$				ng/g Dry weight
	Total ^a	Total ^b	Microcystin-LR ^a	Microcystin-RR ^a	Microcystin-LR ^c
Water 1	46.4 ^d	ND ^e	4.33	<0.05	NA ^f
Water 2	22.2	329	6.99	<0.05	NA
Water 3 ^g	>50 ^h	60,000	349 ^h	1.22	NA
Water 4	>50 ^h	14.4	1,890 ^g	17.5 ⁱ	NA
Water 5	>50 ^h	17.8	11.5	0.13 ⁱ	NA
Water 6	>50 ^h	ND	43.3	0.29 ⁱ	NA
Water 7	ND	30.4	ND	ND	NA
Gastrointestinal contents	NA	NA	NA	NA	5,700

^a Region 8 Laboratory–US Environmental Protection Agency; sampling date was 29 August 2016.

^b GreenWater Laboratory; sampling date was 31 August 2016.

^c D1612253 Laboratory of the California Animal Health and Food Safety Laboratory System.

^d Estimated value; sample temperature outside of criteria.

^e ND=not done.

^f NA=Not applicable.

^g Water sample closest to bat mortality.

^h Estimated value; above the range of quantification.

ⁱ Estimated value; continuing calibration verification recoveries above criteria.

sample. Neither cylindrospermopsin (RL=0.10 $\mu\text{g/L}$) nor saxitoxin (RL=0.05 $\mu\text{g/L}$) was detected (Table 1).

On 2 September 2016, we conducted complete necropsies of seven of the eight bats submitted to the USGS-NWHC (Table 2). The remaining carcass was unsuitable for postmortem investigation given its very poor postmortem preservation state when reassessed at arrival. All necropsied bats were male adults and were identified as little brown bats (*Myotis lucifugus carissima*) on the basis of a combination of external morphologic features (Rodhouse et al. 2008) and mitochondrial DNA sequencing (GenBank accession numbers MG851797–MG851820) (Vonhof et al. 2015). The fur of two bats was partially covered with bright green dusty material consistent with dry cyanobacteria. All bats were in good body condition, and three bats had abundant green material (presumptive cyanobacteria) in their stomachs, suggesting acute death after ingestion.

All bats presented apparently normal intestinal contents and no evidence of trauma. Histopathologic examinations of formalin-fixed and paraffin-embedded organs from each prosected bat revealed no major microscopic changes besides nonspecific antemortem agonal changes (i.e., severe pulmonary congestion) or those caused by mild to moderate autolysis. When present, the gastrointestinal content consisted of partially digested arthropods. Bacterial culture from aseptically collected lung and liver samples from three bats yielded mixed growth of environmental bacteria, likely postmortem tissue invasion. Brain tissue from three of the prosected bats was negative for rabies by direct fluorescence antibody test performed at the Wisconsin State Laboratory of Hygiene, Madison, Wisconsin. We sent 5 g of pooled gastrointestinal contents from five of the prosected bats to the California Animal Health & Food Safety Laboratory System, Davis, California to test for cyanobacterial

TABLE 2. Physical measurements, necropsy findings, and ancillary test results of eight adult male little brown bats (*Myotis lucifugus carissima*) found dead at Scofield Reservoir, Carbon County, Utah submitted for necropsy. All bats were in good body condition and all were in fair postmortem preservation state except for bat 2 (very poor) and bat 4 (poor). All necropsied bats had diffuse, acute, and severe pulmonary congestion and apparently normal intestinal contents.

Bat ID	FAL (mm) ^a	Body weight (g)	Microcystin-LR ^b	FAT ^c	Additional necropsy findings
1	37.56	5.4	Yes	ND ^d	Empty stomach
2	38.91	5.3	ND	Negative	ND
3	38.99	8.8	Yes	ND	Ventral and dorsal fur of the body, head and wing membranes diffusely covered with green dusty material; abundant green content in stomach microscopically identified as partially digested arthropods.
4	37.62	7.6	ND	Negative	Abundant green content in stomach.
5	36.54	5.8	Yes	ND	Fur of the ventral body diffusely covered with green dusty material; abundant green, finely granular content in stomach.
6	39.16	6.0	ND	Negative	Abundant green, finely granular content in stomach.
7	37.67	6.2	Yes	ND	Small amount of green, finely granular content in stomach.

^a FAL=forearm length.

^b MCLR= detection of MCLR by liquid chromatography–tandem mass spectrometry from pooled gastrointestinal content of five bats at D1612253 Laboratory of the California Animal Health & Food Safety Laboratory System.

^c FAT=fluorescence antibody test for rabies lyssavirus detection in fresh brain at Wisconsin State Laboratory of Hygiene.

^d ND=Not done.

toxins by LC/MS-MS (RL=10 ng/g), and MC-LR was detected at a concentration of 5,700 ng/g dry weight (Table 1).

On the basis of the exclusion of other causes of acute death (i.e., rabies lyssavirus infection, bacterial septicemia, or trauma) and the high levels of MC-LR detected in the gastrointestinal contents of prosected bats and in the water from the reservoir, we considered acute MC-LR intoxication as the most likely cause of mortality.

Microcystin-LR synthesized by the cyanobacterium *M. aeruginosa* is the most common cyanotoxin detected in freshwater cyanobacterial blooms (Hitzfeld et al. 2000). Microcystin-LR is a cyclic heptapeptide hepatotoxin that induces centrilobular hepatocyte rounding, dissociation, and necrosis due to inhibition of protein phosphatases (Runnegar et al. 1993). Although we observed no major

hepatic lesions in the submitted bats, mild to severe autolysis present in the histologically examined tissues may have obscured minor hepatic changes. Furthermore, there are no descriptions of acute and peracute toxic effects of MC-LR in bats.

We report the potential risk for bats to be exposed to high doses of microcystins and the first strong epidemiologic and toxicologic evidence of a bat mortality event after exposure to microcystins. Although more information is needed on the deleterious impact of microcystins to bats, they might represent a health risk not previously assessed for bats in North America, especially for species that forage over, or regularly drink from, water bodies prone to cyanobacterial blooms.

We thank Benjamin Holcombe, Brady Bradford, Jodi Gardberg, and Scott Hacking

(Utah Department of Environmental Quality) for collecting and shipping water samples for toxicologic analysis; Tina Laidlaw and William Batschelet (US Environmental Protection Agency) for the toxicologic analysis of water samples; and Calvin Black, Scott Gibson, and Justin Hart (Utah Department of Wildlife Resources) for fieldwork. Use of trade, product, or firm names is for descriptive purposes only and does not imply endorsement by the US Government.

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Arkansas Department of Health

4815 West Markham Street • Little Rock, Arkansas 72205-3867 • Telephone (501) 661-2000

Governor Asa Hutchinson

Nathaniel Smith, MD, MPH, Director and State Health Officer

3 August 2018

Dear Veterinarian:

Subject: Harmful algal blooms and toxin poisoning in dogs

Harmful algal blooms (HAB) from blue-green algae (cyanobacteria) may be intermittently present in parts of the Buffalo River National Park, specifically the lower river region. These algae can produce toxins, such as microcystins and anatoxins, that affect people, pets, and livestock that swim in and drink from algae-contaminated water. Buffalo River National Park manages multiple high-use recreational swim/float areas where people frequently recreate with their dogs. Though we have received only a few reports of human illnesses possibly associated with HABs, we want to inform you of the current situation and provide additional resources should a potential case present at your clinic.

Though this notice is specific to HAB activity within the lower Buffalo River region, it is important to note that HABs are an issue for many lakes, ponds, and possibly rivers nationwide, and their incidence is on the rise. Please consider water exposure and travel history as elements of a patient's medical history.

Clinical Signs and Diagnosis

Signs of cyanobacterial toxin poisoning depend on the type of toxin (hepatotoxin, neurotoxin, or dermatotoxin), toxin concentration, amount consumed, size of the animal, and exposure route. The majority of exposures result in no or self-limiting clinical signs, but ingestion of large amounts of toxin can result in serious illness and presentation for emergency care. Common signs of hepatotoxin poisoning (e.g. microcystins) include vomiting, diarrhea, anorexia, jaundice, abdominal tenderness, and dark urine. Death can occur within days after exposure due to liver failure. Neurotoxins (e.g. anatoxin-a) cause excessive drooling, disorientation, seizures, and respiratory failure. Death follows within minutes to hours after exposure from respiratory paralysis. Additionally, cyanobacteria may produce dermatotoxins, which result in rash, hives, or an allergic reaction in the exposed animal.

Diagnosis is based primarily on history of recent exposure to cyanobacteria, clinical signs of poisoning, and necropsy findings. Diagnostic methods include analysis of stomach and fecal content and liver histopathology.

Treatment

Untreated, cyanobacterial toxin poisonings may be fatal in animals. Prompt veterinary care is critical for patients showing hepatic or neurologic symptoms and should include supportive care.

There are no antidotes to these toxins, but experimentally, oral cholestyramine has shown promise for treatment in dogs. Inducing vomiting within the first two hours of ingestion may minimize absorption of ingested toxins. Activated charcoal slurry may be of benefit to bind toxins in the gut if cholestyramine is not available. Pet Poison Hotlines may be consulted for additional treatment advice.

To report an illness: contact Arkansas Department of Health at adh.zoonotic@arkansas.gov or 501-280-4136.

To report suspect nuisance or harmful algal blooms: contact Arkansas Department of Environmental Quality at https://www.adeq.state.ar.us/complaints/forms/nuisance_algae_complaint.aspx or https://www.adeq.state.ar.us/complaints/forms/harmful_algae_complaint.aspx or 501-682-0923.

For additional information:

Laura Rothfeldt, DVM, DACVPM
State Public Health Veterinarian
Arkansas Department of Health
Zoonotic Disease Section
Office: 501-280-4136
Laura.Rothfeldt@arkansas.gov

http://www.merckvetmanual.com/mvm/toxicology/algal_poisoning/overview_of_algal_poisoning.html?qt=cyanobacteria&alt=sh

<http://www.mdpi.com/2072-6651/5/6/1051/htm>

<http://www.health.state.mn.us/divs/idepc/diseases/hab/vet/index.html>

http://www.dec.ny.gov/docs/water_pdf/habspets.pdf

<https://www.nps.gov/buff/learn/news/buffalo-river-water-quality.htm>

Engineer Permits Branch, Office of Water Quality 5301 Northshore Drive
North Little Rock, Ar 72118-5317

To support the Denial of 5264-W.

Seems I never get by with just one comment submission but I think it very important to include the information listed here.

August 3rd, 2018 the Arkansas Department of Health posted letter concerning human and animal exposure to algae and that a dog exposed to certain cyanobacteria can die within 2 hours. (ADH letters attached)

This photo was taken Sept 18 2018 and ask you to consider trickle down effects due to the pollution and death of the river and its effects on the wildlife that I so enjoyed years ago. On this trip I did not see a single turtle and the wildlife was very sparse. Very few



frogs were along the banks but instead many flies and biting insects.

The tourist drive thru and eat at our restaurants, sleep in our motels and cabins. They come to see elk, deer, turkey, eagles, the pileated wood pecker, scenic beauty, etc. but there's something smaller here, such as bats and herps and they require quality water for river habitat and visitors come to see that too.

The bats have suffered an immune deficient disease called White Nose Syndrome. Because of that the caves were closed to allow them to recover but what about the importance of their drinking water, the insects they eat and their habitat? How will we manage that?

I read a study 'Mortality of Little Brown Bats (*Myotis lucifugus carissima*) Naturally Exposed to Microcystin-LR'. (attached)

In this report bats were found dead within 5 m of the water and all autopsied bats had diffuse, acute, and severe pulmonary congestion and apparently normal intestinal contents.

Going through photographs taken while employed as a bio tech for AGF & NPS in a herpetological study in the BR watershed I remembered the sensitive species. As I flipped thru the photos I wondered about the abundance of these animals during 2002-2003. The turtles, cricket frogs, peepers, bullfrogs and snakes lined the river banks. In the evenings the gravel bars were alive with tiny frogs croaking, peeping and rattling about. It was a natural experience that still can be heard when I quiet myself and listen.

Carol Bitting

HC 73 Box 182 A

Marble Falls, Ar 72648

This photo taken in 2003 by me and is one of the larger species that would be tangled in algae and probably die.





For Immediate Release:

August 1, 2018

Tips to prevent Recreational Water Illness (RWI) this summer

Little Rock, Ark. – The Arkansas Department of Health (ADH) encourages Arkansans to take some simple steps to stay healthy and prevent Recreational Water Illnesses (RWIs) while relaxing at the state's rivers, lakes, streams, and ponds. RWIs are caused when people swallow water that is contaminated with common germs or bacteria, such as E. coli. People can also become sick when swimming during a harmful algal bloom (HAB).

To stay healthy while enjoying the water:

- Do not swallow water.
- Avoid swimming in algae.
- When in doubt, stay out.

You should avoid entering or playing in bodies of water that:

- Smell bad.
- Look discolored.
- Have foam, scum or algal mats on the surface.
- Contain dead fish or animals or if they are nearby (for example, do not enter a body of water if dead fish have washed up on its shore or beach).

Water quality can change quickly. In general, there is a higher risk of getting sick after a rainfall event or in cloudy water. Rainfall can wash contaminants into the water. Cloudy water due to runoff can contain contaminants that may be harmful. Not all of the contaminants can be seen by the naked eye.

Not all algae are harmful but some algae produce toxins that can make people and animals sick. It is not possible to tell if algae are producing toxins just by looking at the water. The size of the bloom is not related to the amount of toxins that could be present. Children and pets are at the greatest risk from swimming or drinking water when algae are present. You should never drink water when algae are present, even if you have filtered it first. Personal filter equipment and treatment options do not eliminate the risks associated with HABs. Never drink, cook or try to filter water affected by HABs.

Symptoms for RWIs include vomiting and diarrhea. If you believe you have gotten sick from recreational water use, contact the ADH Communicable Disease Nurses at 501-537-8969.

The Arkansas Department of Health (ADH) routinely tests designated swim beaches for E. coli levels in the summer months and recommends closure when E. coli levels are too high. Swim beach closures can be found at both the ADH (<https://www.healthy.arkansas.gov/programs->

[services/topics/arkansas-swim-beach-program](#)) and Corp of Engineers
(<https://www.swl.usace.army.mil/>) websites.

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