Charles J. Bitting
HC 73, Box 182-A
Marble Falls, Newton County, Arkansas 72648

September 3, 2015

C&H Hog Farms EA

c/o Cardno, Inc.

501 Butler Farm Road, Suite H

Hampton, VA 23666

Dear Ms. Banwart:

I am writing this letter to you to express my comments regarding the Draft Environmental Assessment dated August 2015 for C&H Hog Farms in Newton County, Arkansas which you company is completing under contract with USDA Farm Service Agency and the US Small Business Administration. First a little bit of history.

I grew up on a family farm in southwest Missouri. On this farm we raised a variety of products to meet our families needs for cash as well as food and other staples. As I recall, at one time or another, we raised corn, beef cattle, dairy cattle, hogs, chickens, guinea fowl, turkeys, horses, donkeys, geese, ducks, and sheep. We always had a pen of hogs about an acre or more in size. Today these would be called pasture raised hogs, but back then, it was simply a hog pen. I recall that we showed most of these critters, and much of the produce from our large garden through 4-H or FFA at the County Fair and other shows. My ancestral lineage on both my mothers' and fathers' sides were people of the land going back many generations, either raising crops and animals, hunting and fishing, mining, or milling corn and wheat in water powered mills.

I was first introduced to the Buffalo River Country when I was a young boy, maybe 6 or 7. Our neighbors brought my next older brother and I down to camp at Buffalo River State Park, now known as Buffalo Point Campground. Several years later, when I had a car and driver's license, I made many trips down to the Buffalo River, which by that time was the Buffalo National River, to camp, swim, canoe, and hike through the breathtaking scenery. I also spent a good deal of time exploring many of the caves in the area. Little did I realize at this time, but the beautiful Buffalo River would call me back and hold me for most of my adult life.

I received a Bachelor of Science degree in Geology from Missouri State University in 1985. I have worked on the Buffalo River since 1987, primarily trying to understand cave and karst resources and their vulnerabilities. I have worked on many groundwater dye tracing projects, surveyed endangered bats for Arkansas Game and Fish Commission as well as the National Park Service, constructed bat friendly closures of aban-

doned mines and caves, and worked on many other projects in and around the Buffalo River watershed dealing with natural and cultural resource management.

I have read the Draft Environmental Assessment (EA) in its entirety, and would like to comment on each and every point as I feel the document is quite poor. I will limit my comments, however to a selection of issues which I feel are most important. I also understand that others will be commenting on some of the issues which I will ignore in this letter.

Section 1.1.3: On page 1-2 you note that the facility will produce 2,090,181 gallons of waste annually. This is clearly a mistake. The facility, according to the Comprehensive Nutrient Management Plan (CNMP) submitted with the original Notice of Intent (NOI) will produce that much waste in 180 days. Last time I checked, there were 365 days in most years, so if that rate is valid for 180 days, the annual production of waste water is more like 4.2 million gallons.

Section 1.2: I agree that the fact that C&H was constructed and is already in operation does make it more difficult to take the “hard look” at the environmental impacts from the facility. I also know that DIFFICULT and IMPOSSIBLE are not the same thing. Accordingly, you should have attempted to do the difficult task. Your use of Question 3 in the Council on Environmental Quality’s (CEQ) 40 most asked questions to avoid doing the “hard look” in my opinion is a contemptuous affront to Judge Marshall’s order, and dodges the responsibility of FSA and SBA under the National Environmental Policy Act (NEPA) and the Endangered Species Act (ESA).

Had FSA and SBA not made the loan guarantees to Farm Credit Services of Western Arkansas, C&H Hog Farm, Inc. would not exist. The loan guarantees were found to be in violation of NEPA and ESA, because of the failure of FSA and SBA to follow appropriate processes. The loan guarantees are the critical issue. With the loan guarantees, we got a polluting swine Confined Animal Feeding Operation (CAFO) in our back yard. Without the loan guarantees, this CAFO, and its environmental impacts would not exist.

Section 2.1: The No Action Alternative must provide a baseline against which to measure impacts to the human environment. The proposed No Action Alternative in this EA ignores the order of Judge Marshall and the District Court. This proposed No Action Alternative ignores the fact that C&H only exists because of the loan guarantees which the District Court set aside. The only rational No Action Alternative is no C&H Hog Farm. The general conditions of the area prior to C&H Hog Farm can be re-created in the document to allow for informed comparisons between the pre-C&H Hog Farm condition and the Proposed Action in Section 2.2 to re-instate the loan guarantees.

There appears to be a great deal you don’t know regarding the operation of the waste application fields. It would behoove you to find this information out before bringing this EA out for final review. For instance, you know nothing about the frequency, application rate, location, timing, and application method of fertilizer not derived from C&H Hog Farm, not to mention the composition. Non point source pollution of surface and

groundwater result when cumulative fertilizer and manure applications are greater than the nutrients removed from the fields in the form of forage or livestock. If you don't now anything about the fertilizers being used, except for C&H waste, how can you make any reasonable prediction about the impacts of those fertilizers on water quality?

Table 2-1 shows information from the original NOI. Much of this data has been shown to be inaccurate. Even the usage of the individual fields has been evolving with each turn of the wheel. This may seem like a small thing, but rotational grazing removes considerably less nutrient content from a field than haying does.

Section 2.1.4: At the public meeting in Jasper on August 27, Mr. Duane Woltgen clearly pointed out a problem in the EA regarding the pond liners and cover. Don't confuse mils and millimeters, they are not even closely related units of measure.

Section 3.1: You have removed Air Quality as an impact topic. You claim air quality is regulated by the permit, but to my understanding, the NPDES permit is a Clean Water Act permit for protection of water quality, not air quality. Anyway, I can tell you that I find the foul odors from the facility offensive. It is not unusual to smell the hogs and their waste from my home, eight air miles away from the CAFO. Air Quality should be more fully explored in the document, particularly in light of the proximity of the CAFO to the public school in Mt. Judea, Arkansas.

Section 3.2.1: It would appear that your team lacks an understanding of the dynamics of water flow in a karst aquifer. I do not claim to be an expert, but have assisted in a number of karst groundwater tracing studies over the past 25-30 years, and have studied caves for even longer. What I have seen from these studies, and through the observation of springs and cave streams, is that karst aquifers can be very tricky and fickle. The water in them may not flow where you think it should. They may distribute their waters to many outlets based upon the amount of water in the system. Water may cross under other surface streams, something you won't see in a saturated clastic aquifer. Water travels rapidly, thousands of feet a day, you will not see this in a saturated clastic aquifer either. Water can travel through huge passages, or little anastomosing channels on bedding planes, either way, these aquifers can move a lot of water a long distance in a short period of time. Because they are often so open, they do not filter out contaminants very effectively, if at all. Pathogens don't have time to die off in these rapid transport aquifers. Sunlight cannot penetrate cave walls and ceilings, so it cannot zap the pathogens with UV light. Algae and other plants cannot grow without sunlight, so nutrient loads pass right through unabated. Karst aquifers are special. Karst aquifers are vulnerable. Karst aquifers contain very rare and unusual critters. Karst aquifers need protection. You need to put more effort into this section.

You place too much faith in the Big Creek Research and Extension Team (BCRET) project. I don't think they are even doing what former Arkansas Governor Mike Beebe charged them to do when he provided "Rainy Day" funding to the University of Arkansas to start up the project. Their sampling stations appear to be in a state of disrepair, their reports contain significant amounts of "No Data" for specific dates. Prior to inclusion of

USGS staff, they did not have any expertise in karst hydrology or karst geology. Theirs may be a part of the “Best Available Scientific Information” available, but is only a part.

The NPS has been collaborating with Arkansas Department of Environmental Quality (ADEQ) to collect data on the water quality of the Buffalo River and Big Creek for over 25 years, yet their data is essentially ignored. The data is available on the EPA STORET site for all to peruse. Why didn’t your team take a look at it?

USGS has a sophisticated gaging station on Big Creek which is co-located with the NPS sampling site which you have completely ignored.

Dr. John Van Brahana, emeritus professor of karst hydrology at University of Arkansas has plenty of data available, but you ignored this fact.

You have a lot of work ahead of you, and not much time to complete it.

The Big Creek Research and Extension Team (BCRET) was supposed to look at the impacts of C&H Hog Farms impacts upon the Buffalo River according to the office of former Governor Beebe. BCRET has studiously avoided sampling on the Buffalo, or doing any research which could pin pollution impacts in the Buffalo on C&H.

Much of the automated equipment BCRET has in the field appears to be dilapidated and not in working condition.

BCRET does not do automated storm sampling during the winter months when runoff is most likely.

BCRET has failed to conduct any dye traces.

BCRET is only looking at a very small subset of the fields, even though the Governor said they could look at all of them.

The BCRET V-notch weir on field 12 appears to be designed to catch almost no runoff, based upon the topographic mapping of the field and its placement.

BCRET only released the very important Electrical Resistivity Imaging data after a Freedom of Information Act (FOIA) request. This data supports the hypothesis that many of the spreading fields are on well developed karst surfaces. This provides a quick and fairly direct link for contaminants in the hog waste to travel from the surface into the groundwater where they can be carried long distances in short time frames. The wastes could easily bypass the sampling stations BCRET has below C&H.

It appears to me that the Nitrate+Nitrite as N at the USGS Big Creek near Mt. Judea gage just below C&H (Figure1) is two to three times greater than at the USGS Big Creek at Carver gage (Figure 2). It also appears the N values have a strong diurnal swing in Figure 1. This makes me think the spring is discharging wastes from C&H, and

the diurnal swings are associated with daily uptake of N by algae. These strong swings are not apparent in Figure 2

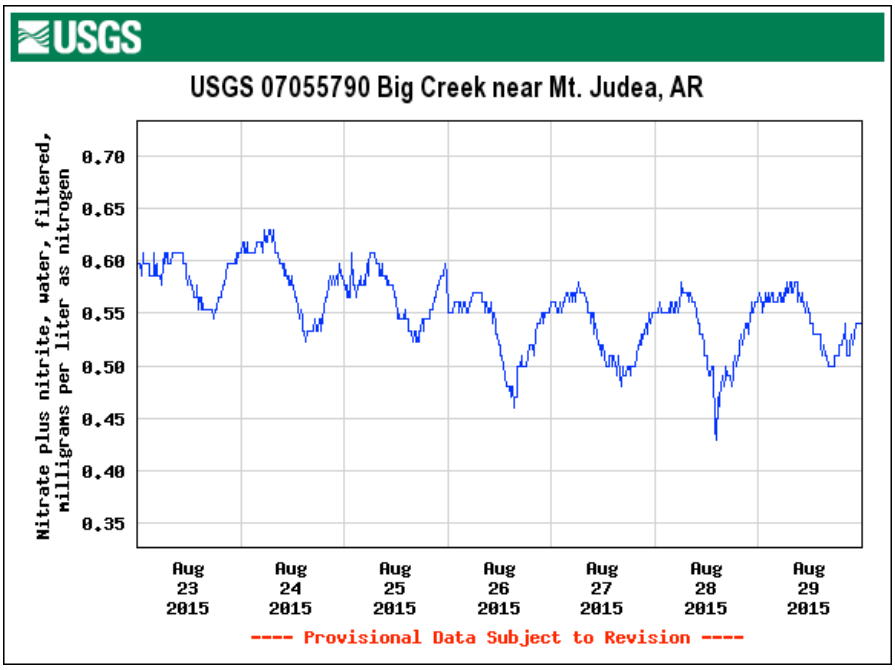

Figure 1: Nitrate plus Nitrite Big Creek near Mt. Judea. USGS Station 07055790

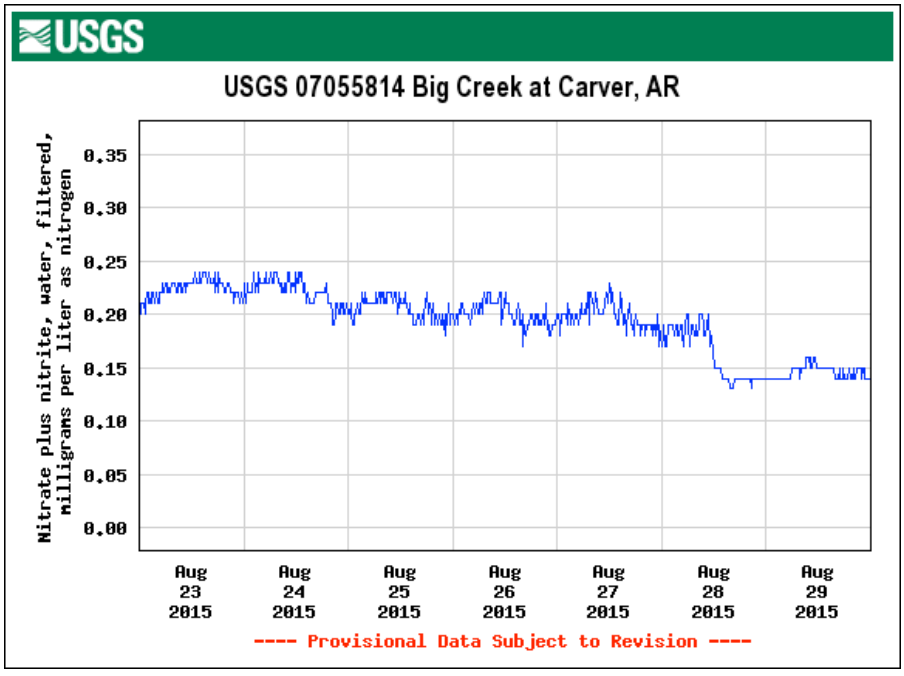

Figure 2: Nitrate plus Nitrite Big Creek at Carver. USGS Station 07055814

The gaging station at Carver has a much larger watershed and represents more cattle grazing and hay land than the gaging station near Mt. Judea. Why are the nitrate plus nitrite levels so much lower down the system when we should expect a cumulative increase in contaminants?

Page 3-11, Site Groundwater Quality and Use, Paragraph 2 claims "It is unknown whether there are any karst features beneath the field (sic) where wastes are applied." There seems to not be much knowledge of what karst means, so I thought I would provide you with a definition that is pretty well accepted.

Technical Definition of Karst:

A terrain, generally underlain by limestone or dolomite, in which the topography is chiefly formed by the dissolving of rock and which may be characterized by sinkholes, sinking streams, closed depressions, subterranean drainage, and caves.
(Monroe, W.H., 1970, A glossary of karst terminology: U.S. Geological Survey, Water-Supply Paper 1899, 26 p.)

To this definition, I would add springs.

Now for the evidence.

- Field 1, or the area around it contains a spring. BCRET has been sampling it for some time.
- Big Creek for its entire distance next to the waste spreading fields consists of many segments of sinking stream with widely separated pools.
- Dry Creek, adjacent to the most upstream waste spreading fields is a sinking stream and even has karst solution features in its bed.
- Waste spreading field 12 has a sinkhole as described in the ERI mapping.
- BCRET notes there are karst seeps and springs downhill of the waste storage ponds in their "Response to the Expert Panel Review of the BCRET Project" (http://www.bigcreekresearch.org/docs/Response%20to%20Expert%20Review%201.pdf) under Item A.
- There are known caves very close to some of the waste application fields.
- There are sinkholes known on waste application fields 1, 5a, and 12. They are mentioned in the BCRET Response to Expert Panel document under item C(v).
- There are numerous sinking streams between many of the waste application fields. There is even a sinking stream running through the middle of waste application field 10.

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Page 3-14 first full paragraph claims that the waste application fields are on a perennial waterway. This is untrue, Big Creek in the reach adjacent to the waste application fields is primarily a sinking stream. This paragraph goes on to say that if wastes were leaching into the alluvial groundwater, they would be picked up downstream at the monitoring station. Since the stream is not perennial, there is probably not a whole lot of alluvial groundwater. Instead there is karst groundwater which could easily bypass the monitoring station.

Figure 3-2 and 3-3 have very different scales making comparisons between the figures virtually impossible. Please use similar scales in your graphing.

Figure 3-4 seems to show a striking case of Nitrate-N being higher downstream of the facility than upstream. It is unclear how your document explains away this difference without implicating the waste application on the fields.

Figure 3-5 has a pretty poor scale. Each dot is greater in diameter than a single marked graduation in Figure 3-4. Are you trying to hide the pattern of N downstream v. upstream?

Figure 3-6 is useless. E coli are measured in colonies per 100ml or colony forming units (CFU) per 100ml, not mg/L. The scale on the left hand side of the graph hides very important information. 126 Col. of E. coli/100mL is the swim beach standard set by Arkansas Department of Health. 410 Col. of E. coli/100mL is the primary contact recreation limit for primary contact recreation. The dots in the graph appear to have a diameter of roughly 750 units. Each dot is therefore nearly twice as wide as the upper limit for primary contact water. You need to re-do this graph so it means something.

Figure 3-7 is even more useless. Each dot is an order of magnitude greater in diameter than in Figure 3-6. In other words, each dot represents 7,500 units. Please take this graph out as it serves no useful purpose.

Page 3-18 first paragraph says the water quality standards have not been exceeded for nutrients or bacteria. This does not appear to be true if there are E coli readings in the tens of thousands as Figure 3-7 indicates. Your team needs to do its homework.

Page 3-18 second paragraph says no data indicate pollution from the facility. To me, it looks like the facility is indeed polluting Big Creek. I would also say the facility is polluting the Buffalo River through movement of contaminated groundwater in the karst aquifer.

Page 3-19 second paragraph makes a completely unsubstantiated claim that fertilization of the waste application fields is more carefully managed under the NMP than it was historically. You provide not a single shred of data to base this claim on.

Page 3-19 third paragraph again claims that water quality standards have not been exceeded. This is patently false. You go on to say there are not trends in nutrients or E coli, this is not true either if I am reading Figure 3-4 correctly.

Page 3-20 first paragraph says the pond leakage would only amount to 0.0013 inch/day. The actual drop of the ponds would be much closer to 0.2 inches per day.

Relying upon the borings to tell you anything about the karst is a fools errand. You should strike this from the document and use the borings for their intended purpose which was to describe the depth and characteristics of the soil and regolith above the bedrock for engineering purposes.

As noted by Duane Woltgen at the public meeting in Jasper on August 27, the proposed HDPE pond liners and cover thicknesses should be expressed in mils (1 mil = 1/1,000 inches), not millimeters (1/25.4 inches).

I believe impacts to the groundwater have already occurred as the barns, waste storage ponds, and 90% of the spreading fields are on highly fractured karstified bedrock. The EA as well as other data which has been collected by BCRET, NPS, and others appears to support this. If you have any evidence to the contrary, you should present it.

In an unconfined aquifer, water flows downhill. When given a choice between two routes to base level (water table), water generally choses the shortest and quickest route. The Boone formation karst aquifer is generally an unconfined aquifer providing exceptional vertical and lateral communication for water.

In the Geology and Soils Section you note the Ozark Plateaus are an ancient, variably karstified region with more than 8,000 reported caves and tens of thousands of springs, with a wide and diverse suite of accompanying karst landforms. This is true. In my nearly 40 years of caving experience, I can tell you that for every reported cave, there are probable several or many more which have not been reported. There are probably at least one order of magnitude more which have no visible expression on the surface, yet they exist nonetheless. The Buffalo River region has seen considerable uplift, but so has most of the Ozarks.

If you would review recent aerial photography, you would note many areas of the waste application fields where bedrock appears to be at the surface. If I recall correctly, the first ADEQ inspection of C&H, euphemistically called a “Compliance Assistance Inspection” showed areas of bedrock exposure in some of the fields. You need to take note of this in your EA as your evidence of deep soil is as bare as some of these rocks.

You completely fail to make any connection between leakage of thousands of gallons of swine waste on a daily basis into a karst setting and geologic impacts. There have been a number of large sinkhole collapses under stock ponds, houses with leaking plumbing, waste storage ponds, and sewer lagoons in the Ozarks. You have no data that would lead one to believe there are not sinkholes under the waste storage ponds.

There is sufficient data already that show sinkholes in some of the fields. Will adding hog waste to these fields upset a delicate balance and cause sinkhole collapse? This would be a geologic impact which you should analyze.

In the section on Threatened and Endangered Species you quickly eliminate the bats from consideration because they are terrestrial species. What you fail to note is that all of these T&E bat species are are cave dwelling bats. You also fail to note that White Nose Syndrome, or the causative agent (*Pseudogymnoascus destructans*), has been cultured from the tissues of each and every one of these species. I realize you are trying to discuss direct impacts, but you will have to consider the cumulative impact on these species as well. All of these bats forage over water for aquatic insects such as Plecoptera, Tricoptera, and Ephemeroptera which also happen to be indicators of good quality water. Water pollution of the streams as a result of waste storage pond leakage and waste application field leaching into the karst groundwater in addition to overland flow of wastes into the surface streams could make the streams unsuitable for this suite of insects. Such pollution could drastically reduce the availability of prey, and may require the bats to abandon some of their favored roost caves for roosts closer to good quality water. This could create a small ecological bottleneck which could make the bats more susceptible to disturbance from human intrusions on their roosts, or White Nose Syndrome.

In Section 3.4.2 on page 3-32 third paragraph, you note there are not data to suggest the operation is negatively impacting water quality. I would say you cannot make this statement based upon the data you have provided in this document.

Page 3-33 first full paragraph again makes a claim which you cannot back up. Specifically, you claim that the waste application fields have historically been fertilized at unmanaged rates and without buffers near waterways. Please provide proof that you met with the farmers in the valley and have received information from them which corroborates your claim.

Page 3-33 second full paragraph makes the mistaken assumption that following the Arkansas Phosphorus Index for land application of wastes will prevent nutrients from leaching into the groundwater. I have read everything about the API I can find. I have never seen any claim that it prevents this leaching. It is concerned about binding Phosphorus to the soil particles and into plant fiber. It tells us nothing about the fate and transport of Nitrogen or any of the other macro or micro nutrients in hog waste.

Page 3-33 fourth full paragraph again uses the wrong number for vertical drop from waste storage pond leakage. There are no data on seepage from the ponds because BCRET has refused to measure the pond levels at the precision required. Apparently they lack the will to do so, because I know they do not lack the ability or know-how.

Page 3-33 last paragraph again makes the statement that there are no known karst features under the application fields. I have already pointed out the fallacy of this statement.

Section 3.5 page 3-34 describes the relationship of the facility to Buffalo National River. What this document fails to mention is that the Buffalo River is a Tier 3 stream for the purposes of the Clean Water Act Anti-degradation Rule. The ponds discharge into the groundwater, and this discharge most likely is transported by the karst aquifer to Big Creek and the Buffalo River. The waste spread on the fields likely leaches down to the karst groundwater and finds its way to Big Creek and the Buffalo River. Both of these appear to be discharges. Without an antidegradation review, how can this permit even exist?

Section 3.5.2 claims there are no data to suggest the facility is polluting the Buffalo River. I would suggest that there is indeed evidence, but you have failed to look for it, even though it is in your EA. That does not mention the other sources of data which your team failed to access.

Section 3.6 claims odor is subjective. This is true. The odorscape of the area has changed, and I think it has changed for the worse since C&H began operation. I live eight air miles from the facility, yet I, with a fairly un-sensitive nose can smell it at my house on a fairly regular basis. When I am home, I like to spend most of my free time outside. When the odors from C&H are bad, I cannot enjoy my property like I did before they started operation. The odors in swine waste are only one of the problems. The odorants we can smell, but there are many compounds in these aerosols which we cannot smell. Some of these compounds may cause serious health conditions. Since the EA does not provide a chemical breakdown of the waste, how can there be any estimate of the impacts from the aerosols from this waste? An accurate accounting of the chemical compounds in the swine waste needs to be provided to the public so informed decisions can be made by FSA and SBA.

Section 3.7 states that the socioeconomic impacts of C&H are related to its contribution to employment, income, and tax revenues in Newton County. You fail to mention the ongoing impacts of odor on vacation and leisure businesses in the county, which has been a growth sector for over a decade. You fail to note the potential impacts to the vacation and leisure segment of the county which could be damaged by the ongoing water pollution of Big Creek and the Buffalo River. You failed to even look at the tax base provided by the vacation and leisure businesses in the county. You should certainly get these numbers from the Newton County Assessor. I think you will see that the $7,000 paid in county taxes by C&H will be dwarfed by the amount paid by this sector of the economy.

Section 3.8 claims there will be no disproportionate effects to low income populations because C&H must operate under their NPDES Permit. Phooey! NPDES Permits are Clean Water Act permits. They are not Air Pollution permits, so they don't manage for

odor effectively. They were never designed to have any impact on Environmental Justice. That is not their intended function, and to claim otherwise is foolish. You need to go back to the books and work on this section. The impacts from C&H on low income populations, which describes a large portion of the Newton County population, need to be addressed. If low income residents are displaced from the area because of air and water pollution and have to sell their property, they will be hit very hard by the depressed land values CAFOs such as C&H cause. If low income residents want to rent out their property as a vacation rental, but the pollution from C&H scares prospective guests off, they have been hurt. Because the NPDES permit C&H has was not tailor made to fit the ecological conditions the facility was established in, it cannot be expected to prevent pollution of the surrounding landscape.

Cumulative Impacts

There are likely to be cumulative impacts to water quality for Big Creek and the Buffalo River from this facility which you have failed to mention. Increased large truck traffic in the form of waste spreader trucks, feed delivery trucks, and hog trucks on the gravel roads will liberate additional sediment from the roads, likely resulting in greater sedimentation of Big Creek, and in turn, the Buffalo River.

There are likely to be cumulative impacts to air quality for the area from this facility because of the fugitive dust from the large trucks using the gravel roadways.

There are likely to be cumulative impacts to endangered bats from the facility because many of these species which appeared stable or recovering are also being hit with White Nose Syndrome. The stresses discussed earlier in this review regarding pollution of the streams reducing foraging success, will compound the impacts of White Nose Syndrome.

This concludes my comments for now. I look forward to the opportunity to comment further when the final EA is available for public comment.

Sincerely,

/s/ Charles J. Bitting

cc: Buffalo River Watershed Alliance