

April 6, 2017

To Whom It May Concern,

**RE: C&H Concentrated Animal Feeding Operation (CAFO) request for comments to change the CAFO's permit from a Regulation 6 (Discharge) to a Regulation 5 (No Discharge) Draft Permit No. 5264-W, AFIN: 51-00164**

I am a former employee at the Arkansas Department of Environmental Quality in the Water Division and the Hazardous Waste Division and I would appreciate all of my questions being answered in the following transmittal.

Citation 5.402 of Regulation 5 reads as follows:

"Design Requirements (A) Designs and waste management plans shall be in accordance with this Chapter and the following United States Department of Agriculture Natural Resource Conservation Service technical publications: (1) Field Office Technical Guide, as amended. (2) Agricultural Waste Management Field Handbook, as amended".

Therefore, C&H Concentrated Animal Feeding Operation (CAFO) should be in accordance with the guidelines set forth in the Natural Resources Conservation Service (NRCS, 2012) Agriculture Waste Management Field Handbook (AWMFH), as amended before a Regulation 5 permit can be mistakenly issued to the C&H CAFO.

The draft referenced Regulation 5 Permit does not provide sufficient information regarding citation 5.402. Please provide documentation that each citation in the Agricultural Waste Management Field Handbook has been addressed for the referenced Regulation 5 permit. Regardless, if the citations are considered guidance are not. Please give special attention to Chapters 2, 5, 7 and 10. The AWFH categorizes risk factors associated with siting a CAFO in Table 10-4 as Slight, Moderate, High and Very High. Numerous professional scientific reviewers, primarily Arkansas Registered Professional Geologists, have agreed that the C&H CAFO is categorized as **"Very High" risk**. In other words, this facility and associated spreading fields are definitely sited in a unacceptable area and should not have been initially permitted based on karst geology and floodplains. Table 10-4 in addition with documented elements of the Harbor (2016) investigation regarding loss of circulation of potable water, large amounts of potable water needed during drilling, "possible void" and the additional 104 gallons of Portland cement needed to grout the borehole directly adjacent to the swine waste lagoons and above 28.5 feet below ground surface (b.g.s.) dictates that this CAFO is definitely not eligible for a Regulation 5 permit according to the AWFH. The Arkansas Department of Environmental Quality (ADEQ) has stated, "we made a mistake" with respect to permitting the C&H CAFO. Does ADEQ want to make another costly taxpayer "mistake"? If so, this is insane and defies logic.

My supposition is that ADEQ believes that a Regulation 5 permit can't be denied because of influential entities (e.g. special interests/lobbyists) and the CAFO is too far along in the regulatory process to make

a change now in spite of the many technical facts (e.g. that have been repeatedly written about and spoken about) that strongly support that this CAFO should have never been initially permitted. An analogy for this scenario is that there is a runaway train and the only thing ADEQ can do is let it crash before they respond. Hopefully, ADEQ will not let this occur by denying the CAFO a Regulation 5 permit. We do not want to continue degrading the tributaries in the in the fifth largest watershed that drains into the Buffalo National River (BNR), our Nation's first designated National River, and the groundwater that the public relies on for drinking water for human and agriculture consumption.

Many of the public's questions were avoided, or "brush stroked" which has been typical of ADEQ with respect to responding to questions and comments regarding the C&H CAFO. In particular, the C&H Integrity testing that was conducted during September 2016. The following questions are applicable to citation 5.402 in Regulation 5 and the associated AWMFH, as amended, which requires ADEQ to respond to the C& H Integrity investigation that included a single borehole that was drilled in September 2016, based on a dated geophysical investigation, as it all relates to geology at the CAFO. Therefore, in addition to addressing the citations in the AWMFH as mentioned above, please answer the following relevant (e.g. per Regulation 5, Citation 5.402) questions regarding the geology and other issues at the CAFO facility prior to mistakenly issuing a Regulation 5 permit to the C&H CAFO:

- Mr. Huetter's (Harbor 2016) field book indicates that 50 gallons of grout was needed to grout a six inch diameter borehole for the last 12 feet. What is ADEQ's opinion of this anomalous volumetric amount of grout required for this short vertical distance that is directly adjacent to the swine waste lagoons when it has been calculated that it would only take approximately 17 gallons?
- It is noted on Harbor's boring log that " Total approx. 750 gallons of potable water added" at 38.5 feet (ft.) below ground surface (b.g.s.) while drilling a 120.5 ft. borehole. Anomalous amounts of grout were consumed and circulation losses were noted above the competent bedrock/regolith lithologic contact at 28.5 b.g.s.. This is/was an important area to delineate because this lithologic interval is directly adjacent and below the swine waste lagoons where potential swine waste leaks could have been initially detected. Does ADEQ think it is possible that discrete or perched groundwater in this interval (e.g. commonly referred to as epikarstic flow by Hydrogeologists) could have been missed because of the introduction of large amounts of potable water during drilling operations?
- The data from the single borehole Harbor (2016) and information provided by Mott (2016), Hubbard (2016) and numerous Arkansas Registered professional Geologists define the area underlying the waste lagoons as "pinnacles and cutters" which is a characteristic of epikarst and is a karst feature. Does ADEQ agree that karst underlies the two swine waste lagoons at the CAFO?
- Is it possible that there was an underestimate of 104 gallons of Portland cement required for grouting the borehole other than Harbor's explanation of weathered limestone, fractures, "possible void" ADEQ (2016) at 25 ft. b.g.s. as opposed to enhanced solution feature(s)?
- Did a ADEQ Arkansas Registered Professional Geologist review the initial Regulation 6 permit?
- Is a ADEQ Arkansas Registered Professional Geologist reviewing the proposed Regulation 5 permit?

- Does ADEQ believe more borings are needed to define the geology per AWMFH before a Regulation 5 permit can be mistakenly issued for the CAFO?
- Does ADEQ believe ERI geophysical signatures can change over time?
- Why wasn't the rotosonic drill rig equipped with the proper mechanical apparatus(es) to properly complete this costly taxpayer project? ADEQ states that a high speed rotation tool was not available at the time. Why didn't ADEQ, as they require consultants to do, request the consultant to get the proper drilling equipment to the site on this costly taxpayer job?
- There are serious concerns regarding the existing clay liner at the C&H CAFO because of oversized rocks incorporated into the clay liner that did not meet the Quality Assurance/Quality Control Plan (QA/QC) submitted by C&H's engineer that was approved by ADEQ (Attachment A). This is not in accordance with the permitting process at ADEQ. These oversized rocks were cited by an ADEQ inspector and photographs are on the ADEQ website as well as other locations. Erosion rills were also photographed. This inspector was stationed in ADEQ's former Jasper, AR office which is approximately 10 miles away from the CAFO. He was not allowed to inspect the CAFO again. All of the inspector's that conducted inspections at the CAFO started coming from Little Rock at an additional cost to taxpayers. **Please explain why this occurred when there were qualified personnel available to inspect the CAFO in Jasper, AR?**
- As stated above, C&H's engineering consultant affirmed in their QA/QC plan, which was approved by ADEQ, that no rocks larger than four inches would be incorporated into the clay liner (Attachment A). I am a former ADEQ employee in the Water Division and the Hazardous Waste Division and I possess knowledge of the permitting process. **ADEQ should have issued a notice of deficiency (NOD) and not approved the CAFO permit until C&H met the approved QA/QC design criteria for the liner.** This is typical permitting protocol within ADEQ. Therefore, why did a Professional Engineer at ADEQ approve the existing clay liner and why was the initial permit issued when QA/QC objectives approved by ADEQ were not met on this extremely important aspect of the Regulation 6 and currently the Draft Regulation 5 CAFO permit?
- Please explain why ADEQ has approved synthetic liners to be placed in Waste Lagoons 1 & 2 when there are numerous large serrated rocks exposed in the clay liner that are in violation of C&H's QA/QC plan and should not be there?

Delevan (2017), Brahana (2017, 2016, 2015, 2014, et.al.), Mott (2016), Hubbard (2016), Murdoch (2016 et. al.) and I as well as numerous Arkansas Registered Professional Geologists believe the C&H Facility and the spreading fields are situated on karst. Please note that the AWMFB citation 651.0702 states the following:

"Sinkholes or caves in karst topography or underground mines may **disqualify** a site for a waste storage pond or treatment lagoon. Sinkholes can also be caused by dissolving salt domes in coastal areas. The physical hazard of ground collapse and the potential for groundwater contamination through the large voids are severe limitations". I agree with Mr. Hubbard's and Mott (2016) evaluation that the C&H Waste Lagoons have epikarst (i.e. a karst feature) below them. Epikarst has the potential of developing

into a sinkhole. In particular, with the weight of over 2,337,074 million gallons of swine waste in the lagoons resting on top of it. Additionally there is another 615, 946 gallons of swine waste in the in-barn storage tanks that are constructed on fill material. Fill material often subsides over time. This would cause the tanks to potentially rupture. **Why is ADEQ willing to accept these potential catastrophic risks in karst terrain when there is little or no attenuation of waste in conduit flow which is on-site and the surrounding area that drains to the BNR ?**

There are documented signs of degradation of Big Creek occurring since the CAFO has been in operation (Mott, 2016). Big Creek is losing stream in certain segments and is most likely discharging into the Buffalo National River (BNR) below the confluence of Big Creek and the BNR at Carver (Mott, 2016). ADEQ has stated "Practically all of the waste generated from these animal production facilities is land applied and, as a result, nitrate levels measured from this region are atypically high" (Arkansas Department of Pollution Control & Ecology, 1992). Big Creek has not been properly monitored by the Big Creek Research Extension Team (BCRET) because "the probability that the watershed ratio approach would yield unrepresentative flow volumes is therefore high. Instantaneous discharge data were also unavailable for the upstream site; making it impossible to spot check watershed ratio estimates. Big Creek flows across the Boone Formation for 2 miles before reaching the BCRET upstream sampling site, and is known to go dry between the sampling sites. After further analysis, flux comparisons between the upper and lower site are not presented because of the uncertainty introduced in discharge relationships by the karst interactions" Mott (2016). Obviously, Big Creek is a losing stream which has been previously documented and commented on numerous times. There are interbasinal conduit connections in this area, numerous solution channels and fractures. Additionally, there are abundant surface and groundwater interactions within in the CAFO area (Murdoch, et. al. 2016).

However, the BCRET has continuously published data in their Quarterly Reports from upstream of the CAFO on Big Creek and compared it to downstream water quality of the CAFO and concluded that there was no significant changes in water quality from the upstream and downstream sampling locations. This is unattainable when monitoring a losing stream (e.g. Big Creek) in a karst environment.

The interceptor trench that was installed at the site to monitor potential leakage from the swine waste lagoons has been repeatedly called inadequate by Arkansas Professional Geologists since inception. Therefore, both surface and groundwater have not been properly monitored by the BCRET because of the complex hydrologic nature of groundwater flow in karst and \$100,000's of taxpayers' money has been wasted. A proper groundwater monitoring network should be installed and sampled on a quarterly basis if a Regulation 5 permit is mistakenly issued.

Additionally, it is recommended that ADEQ design an aggressive and more frequent monitoring program to ensure run-off is not entering Big Creek and the Left Fork of Big Creek if a Regulation 5 permit is mistakenly granted.

This writer asserts that the Waters of the State are being impacted by the CAFO operations based on geologic knowledge that is associated with karst geology, hydrogeology and existing data. Furthermore, the C&H Integrity Investigation (Harbor (2016) missed the most important interval to delineate above

competent bedrock making that study primarily flawed at taxpayers cost. The AWMFH has not been addressed in the referenced draft permit. Therefore, a denial of the Regulation 5 permit is **demande**.

There have been alternatives that have been presented and discussed that can make this "right" for the stakeholders if anyone cares to listen and act.

Sincerely,

Ray A. Quick, P.G.

Cc: Governor Asa Hutchinson