

C & H Hog Farms, Inc.

Frequently Asked Questions

1. What is the Phosphorus Index?

Answer: For more information on the Phosphorus Index (PI), please see the following link: <http://www.uaex.edu/publications/pdf/FSA-9531.pdf>

2. Why are there no phosphorus index values for Fields 5, 6, 7, and 9 in the nutrient management plan? How can one be sure that land application is protective when these values are missing?

Answer: Email correspondence dated November 20, 2013 (identified on the ADEQ website as “Watkins Land Application Questions and Answers”) explains that the Phosphorus Index (PI) values for fields 5, 6, 7, and 9 were calculated; however, the PI values did not appear in the spreadsheet because the values for Soil Map Unit were manually inserted into the spreadsheet and are only recognizable in the nutrient management planner’s cell when selected from the drop menu for that cell. Since the Soil Map Unit value was not recognized by the spreadsheet, the spreadsheet could not produce a PI value.

In the case of C & H Hog Farms, the PI values listed in the Nutrient Management Plan (NMP) are theoretical and were calculated to demonstrate a worst case scenario before land application was initiated. Under the terms of the permit, the permittee must recalculate the PI using the most recent test results prior to each land application event, and the permittee is only allowed to land apply wastes on fields that rank Medium or Low risk values on the PI scale, which applies a class label to the amount of “risk” of discharge of Phosphorus during land application. Those assigned a class label of High or Very High are viewed as likely to discharge phosphorus; therefore, the Department prohibits land application on those sites classified as High or Very High according to the PI. The Department believes the PI is an acceptable agricultural practice since the amount of nutrients and manure applied on land application areas are based on soils tests and analysis of the liquids in the holding ponds.

3. Why were Fields 7-9 excluded from the University of Arkansas’ Big Creek Research project? How could these fields not be considered in the team’s underground studies when they were identified as a high use and representative fields on the initial list of preferred study fields? How is this a complete study?

Answer: The Department does not have direct authority over the day-to-day activities of the University of Arkansas System Division Of Agriculture Big Creek Research Extension Team in order to ensure that the research being performed is an independent review of the permitted facility. The Department therefore asks that all questions regarding the study be directed to the University of Arkansas.

However, the [University of Arkansas Big Creek Research Team Quarterly Report from October 2013 to December 2013](#) states, “This research project will focus on three permitted application fields, which give a range in landscape position, topography, and soil fertility levels representative of the overall operation.” Additionally, the aforementioned report states, “To address the long-term sustainability of C & H, the project will measure soil fertility levels of all permitted fields at frequent intervals.” Further, the Future Plans section states, “During the second quarter, installation of surface and subsurface monitoring equipment will take place, along with continuous flow and water quality sampling equipment on springs, ephemeral streams, and Big Creek within the confines of the C & H Farm operation. In addition, manure chemical treatment field testing and analysis will take place to guide manure/nutrient management options identification and evaluation. Finally, progress has been made to establish an independent and unbiased review of our work plan by a panel of international experts in the areas of karst hydrogeochemistry and dye-tracer studies, watershed hydrology, soil and water quality monitoring, and farm nutrient management.”

4. What standards are in place to ensure the facility operations are environmentally protective?

Answer: NPDES General Permit No. ARG590000 contains conditions that are consistent with state (APC&EC Regulation No. 5) and federal (40 CFR 412) requirements in order to be environmentally protective. The following are some of these conditions. The permittee must submit annual reports in accordance with NPDES General Permit No. ARG590000 Part 3.2.4. The permittee must analyze manure samples for nitrogen and phosphorus content and soil samples for phosphorus content in accordance with NPDES General Permit No. ARG590000 Part 4.2.1.3. The permittee must perform visual inspections on a daily and weekly basis in accordance with NPDES General Permit No. ARG590000 Part 4.4.1.1. The permittee is also subject to frequent inspections by the ADEQ Inspection Branch and will be required to meet record keeping requirements in accordance with NPDES General Permit No. ARG590000 Parts 4.4.2 and 4.5 to demonstrate proper operation activities. Discharging to waters of the State is prohibited at the land application sites, and any discharges from the holding pond must immediately be reported to the Department in

accordance with NPDES General Permit No. ARG590000 Parts 2.2 and 2.3. The Department is closely monitoring the operations at the facility and will continue to review the Concentrated Animal Feeding Operations (CAFO) General Permit to ensure continued compliance with applicable laws and regulations.

5. The University of Arkansas Cooperative Extension Service Soil Analysis Report in the May 2012 Nutrient Management Plan lists the soil phosphorus for several fields as above optimum. How can land application of wastes that contain phosphorus be acceptable on fields that are already high in phosphorus?

Answer: The University of Arkansas Cooperative Extension Service's [The Soil Test Report](#) explains how to interpret fertilizer recommendations, and the crop notes section provides instructions on when and how to apply fertilizer so as to minimize costs to farmers. A supporting document, [Understanding the Numbers on Your Soils Test Report](#), states the "University of Arkansas uses the Mehlich-3 soil test method and recommends fertilizer rates that optimize plant growth and yield and replace the macronutrients removed by the harvest portion of a crop." These recommendations are "based on crop rotations, soil texture, plan variety, and yield goal when appropriate."

The land application rates are based on the Arkansas Phosphorus Index (PI), which considers the concentration of phosphorus in the soil and in the waste. Exceeding those land application rates would cause the risk assessment to be invalid. The reasoning for why a facility can have high soil test phosphorus concentrations and maintain a low Phosphorus Index Risk Assessment is because soil phosphorus is only one of the factors taken into consideration when evaluating runoff potential. The University of Arkansas Cooperative Extension Service's 2010 *Arkansas Phosphorus Index* equation is as follows:

$$P \text{ Index} = P \text{ Source Potential} * P \text{ Transport Potential} * \text{BMPs Multiplier}$$

Soil Test Phosphorus (STP) is accounted for as part of the P Source Potential calculation. The following is the calculation to determine the P Source Potential:

$$P \text{ Source Potential} = WEP_{\text{coef}} * [WEP + MNRL_{\text{coef}} * (TP - WEP)] \\ + \underline{STP_{\text{coef}} * STP}$$

P Source Potential is a function of Water Extractable Phosphorus (WEP), the WEP Coefficient (WEP_{coef}), the Mineralized Phosphorus Coefficient ($MNRL_{\text{coef}}$), Total Phosphorus (TP), STP, and the STP Coefficient. The coefficients were developed by the University of Arkansas Cooperative Extension Service for eight different wastes

and are listed in Table 1: P Source Coefficients of the University of Arkansas Cooperative Extension Service's 2010 [Arkansas Phosphorus Index](#).

The underlined portion of the equation is the soils contribution to the Phosphorus Index. The STP_{coef} , as stated in the University of Arkansas Cooperative Extension Service's [Using the 2010 Arkansas Phosphorus Index](#), is a research-derived multiplier of 0.0018 for all wastes, which describes the fraction of STP that will likely result in runoff phosphorus. For instance, a field having an STP concentration of 1,000 ppm will contribute 1.8 points to the Phosphorus Index rating. In order to be considered High on the Phosphorus Index, a risk value of at least 67 is required. Therefore, a field with a high phosphorus concentration in the soil can have a low risk of phosphorus runoff because this is only one factor of the Phosphorus Index equation. Land application is only permitted on fields categorized as Low or Medium risk according to the PI.

6. Why was the facility originally granted coverage without a public comment period? What was the public notice process?

Answer: The Notice of Coverage (NOC) was approved in accordance with notification requirements of NPDES General Permit No. ARG590000 Part 5 – NOI and NMP Review & Public Notification Process, which states:

“All applications for permit coverage under this general permit will be reviewed by ADEQ prior to undergoing a public notification process.

- 5.1 Upon receipt of Notice of Intent (NOI) and NMP, ADEQ will review the submitted documents to ensure that all permit requirements are fulfilled. ADEQ may request additional information from the CAFO operator if additional information is necessary to complete the NOI, NMP, Disclosure Statement or clarify, modify, or supplement previously submitted material. If ADEQ makes a preliminary determination that the NOI is complete, the NOI, NMP and draft terms of the NMP to be incorporated into the permit will be made available for a 30-day public review and comment period on the ADEQ website (http://www.adeq.state.ar.us/water/branch_permits/general_permits/default.htm). During this period, any interested persons may submit written comments and may request a public hearing in accordance with APCEC Regulation No. 8 to clarify issues involved in the permitting decision. ADEQ will respond to comments received during this period and, if necessary, require the CAFO operator to revise the nutrient management plan. If determined appropriate by ADEQ, CAFOs will be granted coverage under this general permit upon written notification by ADEQ.

- 5.2 Comments will only be considered if they regard a specific facility's NOI or NMP. Comments on the contents of the General CAFO Permit ARG590000 will not be considered during the public comment period for a specific facility's coverage under this permit.
- 5.3 Any CAFO wishing to modify their NMP must notify the Department of planned changes. If the Department determines the changes are a major modification as specified in 40 CFR 122.63 or Substantial changes as specified in Part 3.2.6 of this general permit, the public notification process outlined above will be followed as appropriate."
7. Was the permittee required to provide a notice to surrounding landowners when filing a Notice of Intent (NOI)?

Answer: No. At the time of submission of the NOI, the permittee was required to submit the following in order to apply for coverage in accordance with NPDES General Permit No. ARG590000 Part 1.5.1: an NOI and NMP in accordance with 40 CFR 122 and 412 and ANRC Service Practice Standard Code 590, including the PI; a disclosure statement in accordance with the APC&EC Regulation No. 8; a permit fee; an ADEQ Form 1, and plans and specifications that are stamped by a Professional Engineer in Arkansas for construction of ponds. Neighboring land owner notification is not among these requirements.

8. The USDA NRCS RUSLE2 Calculation Record in the NMP states that some fields are occasionally flooded. How is land application under these conditions protective of the phosphorus-limited Buffalo River?

Answer: The Department is tasked with protecting the waters of the State, and the PI is a tool used by the Department to minimize the risk of runoff. Waste will be applied only to those fields in the Low or Medium ranges, which are not indicative of an imminent risk of runoff and are therefore protective of water quality. Further, land application cannot occur if there is pooling or ponding or when soils "are saturated, frozen, covered with snow, during rain, or when precipitation is imminent (>50% chance of rain)" in accordance with NPDES General Permit No. ARG590000 Part 4.2.1.6. The PI must be calculated based on the soil conditions prior to each application. By following these requirements, it allows time for the phosphorus to bind with the soils, resulting in a decreased risk for phosphorus runoff.

9. How do you define seepage? What happens to the seepage? Is it absorbed by the soil?

Answer: Permeability, or seepage, is the quantity of fluid that has passed through the pond liner and into the soils. The design calculations for anticipated seepage are based on [USDA NRCS Part 651 – Agricultural Waste Management Field Handbook – Chapter 10 Agricultural Waste Management System Component Design](#) which states, “NRCS guidance considers an acceptable initial seepage rate to be 5,000 gallons per acre per day. This higher value used for design assumes that manure sealing will result in at least a half order of magnitude reduction in the initial seepage.” Similarly, Section 2.1.2.1 of [Evaluation of Alternative Confined Animal Facilities Criteria to Protect Groundwater Quality From Releases](#) by Brown, Vence and Associates states the potential for contaminants “to seep from the retention pond and enter the surrounding soil depends largely on the hydraulic conductivity [the ease with which a fluid can move through soils] of the liner system and the depth of waste in the retention pond. Published studies clearly show that the hydraulic conductivity of many soil liners is reduced by the organic sludge that blankets the bottom of the retention pond.” Some seepage is expected to be absorbed by surrounding soils, where additional treatment will occur.

10. How many acres are needed to spread the waste without increasing the phosphorus level on the spreading fields? Are the Phosphorus Index ranges listed in the NMP the ranges after the waste is applied?

Answer: The acreage required is dependent upon many variables including the cover crop, Soil Test Phosphorus, and the waste. To apply waste without increasing permeability in the soils would require application at agronomic rates for phosphorus. However, this may not supply enough nitrogen to the soils to ensure proper growth of the cover crop. The permittee must therefore recalculate the PI, which considers nutrients in the soils and wastes, *prior to each land application event* in order to determine appropriate application rates. Land application is prohibited on fields that rank High or Very High on the PI scale.

11. Why does the NMP use a yield goal of 6.5 tons per acre of Bermudagrass instead of 5.8 tons per acre, which is in accordance with “General Traits of Forage Grasses Grown in Arkansas” published by the University of Arkansas Cooperative Extension Service? Why does the NMP also show unrealistic nutrient recommendations to the “Nutrient Applied (lb/ac)” columns of the PI?

Answer: The Department believes a yield goal of 6.5 tons per acre of Bermudagrass to be a conservative estimate of yield as [NRCS Part 651 – Agricultural Waste Management Field Handbook Table 6-6](#) – “Plant nutrient uptake by specified crop and removed in the harvested part of the crop” gives a typical yield of 8 tons/acre for Bermudagrass.

The NMP was developed in terms of a worst case scenario, and the PI, which is recalculated prior to each land application event, accounts for nutrients in the soils and wastes to ensure land application events will not cause nutrient runoff to nearby waterbodies. Since the NMP was developed in terms of a worst case scenario, some of the nutrient values may be beyond what is expected, but within reason.

- 12.** Why does the NMP not meet minimum requirements of the Arkansas Natural Resources Commission (ANRC) Title XXII or NRCS Standard 590?

Answer: The Arkansas Natural Resources Commission developed Title XXII to encourage prudent practices regarding the application and management of soil nutrients and poultry litter in nutrient surplus areas. The Buffalo River watershed is not identified as a nutrient surplus area and is therefore, not subject to requirements of Title XXII.

Natural Resources Conservation Service – Conservation Practice Standard Code 590 (2013) states that an approved nutrient risk assessment for phosphorus must be completed when phosphorus application rates exceed the University of Arkansas fertility rate guidelines for the planned crop. For this reason C&H was required to submit a Phosphorus Index as part of the Nutrient Management Plan. Conservation Practice Standard Code 590 does not specifically limit the runoff risk for phosphorus; however, the CAFO General Permit (ARG590000) limits the runoff risk to medium or low. Therefore, the NMP meets the requirements of Conservation Practice Standard Code 590.

- 13.** Is the facility continuing to represent to ADEQ that Fields 5, 12, and 16 are available for land application when there are mapping and land use discrepancies that should be addressed? Is enough acreage available for land application?

Answer: According to the September 20, 2013 response to an ADEQ inspection letter, land application activities will not occur on Field 5 until further notice. Modification of the NMP would be required prior to use of this property for land application activities (or if additional land application sites were proposed to be added).

The maps in the NMP included property not owned by the individual listed on the land use agreement. Only the property owned by the individual listed on the land use agreement may be applied upon. Updated maps of Fields 12 and 16 have been provided and removal of property is a non-substantial change in accordance with NPDES General Permit No. ARG590000 Part 3.2.6.4(d). The permittee is aware of the property boundaries for Fields 12 and 16.

Additionally, after a review of the NMP and available acreage, the Department has determined that adequate property exists for land application of all generated wastes, even without Field 5, and land application in accordance with the PI is protective of waters of the State. The permittee can only apply wastes on fields that rank Medium or Low risk in the PI. Those assigned a class label of High or Very High are viewed as likely to discharge phosphorus; therefore, the Department prohibits land application on those sites. The Department believes the PI is an acceptable agricultural practice since the amount of nutrients and manure applied on land application areas are based on soils tests and analysis of the liquids in the holding ponds. The permittee must recalculate and document the total nitrogen and total phosphorus applied to each field during each land application event in accordance with NPDES General Permit No. ARG590000 Part 4.5. It should also be noted that in an instance of more waste being generated than can be land applied to the fields as allowed under the permit, Section 3.2.3 of NPDES General Permit No. ARG590000 allows for the transfer of manure or process wastewater to other persons with authority to land apply waste. Records must be kept of these transfers for a period of five (5) years.

- 14.** What health and air quality hazards will the children of the Mt. Judea school and surrounding neighbors be exposed to as a result of the operation? Will well water become contaminated?

Answer: The Department has not received any evidence that the permitted activity endangers human health or the environment. Should strong evidence be provided that warrants investigating, the Department will take appropriate action at that time.

However, Section F of the NMP demonstrates required setbacks are in place in accordance with NPDES General Permit No. ARG590000 Part 4.2.1.5 in that “manure, litter, and process wastewater may not be applied closer than 100 feet to any down-gradient surface waters, open tile line intake structures, sinkholes, agricultural well heads, or other conduits to surface waters, 300 feet of Extraordinary Resource Waters (ERW) as defined by the Department’s Regulation No. 2; 50 feet of property lines; or 500 feet of neighboring occupied buildings.” The Department believes C & H Hog Farms demonstrates compliance with this requirement.

15. How many other hog farms are permitted or being considered in Newton County?

Answer: The Department verified that there are currently four (4) other active hog farm permits under APC&EC Regulation No. 5 and zero pending hog farm permit applications under either NPDES General Permit No. ARG590000 or APC&EC Regulation No. 5 in Newton County as of June 2014.

16. How can ADEQ approve modification in light of the court ruling/finding that the Environmental Assessment was flawed?

Answer: A federal court ruling directs two federal agencies, which provided loan guaranties for C & H Hog Farm, to complete the environmental assessment required under the Endangered Species Act and NEPA in consultation with the U.S. Fish and Wildlife Service within one year. The two federal agencies are the Small Business Administration and the Farm Service Agency. . The operation of C & H Hog Farm under coverage of the CAFO general permit ARG590000 is not affected by the Court's Order.

17. *Escherichia coli* (*E. coli*) levels are increasing and dissolved oxygen levels are decreasing in Big Creek and the Buffalo River. The ponds are likely leaking sewage, and run-off from the fields is contributing to the problem.

Answer: According to the Big Creek Research and Extension Team ("BCRET"), no trends have been observed with *E. coli* in regards to time or at sample locations (i.e. upstream and downstream of land application and storage ponds) since monitoring began in September 2013. Because there is a limited data set, more extensive monitoring is required to determine if C & H Hog Farm has any effect on Big Creek water quality. Other potential sources of *E. coli* include human habitation in the area and any warm blooded mammal. The following document provides a more detailed overview of *E. coli* monitoring Big Creek Watershed by the BCRET:

<http://www.bigcreekresearch.org/docs/Bacteria Trends in Flowing Waters.pdf>.

18. What are the buffer boundaries that C & H Hog Farm are required to maintain?

Answer: The setback requirements in the permit include: 100 feet from any down-gradient surface waters, open tile line intake structures, sinkholes, agricultural well heads or other conduits to surface waters; 300 feet from Extraordinary Resource Waters (ERW) as defined by the Department's Regulation No. 2; 50 feet from property lines; or 500 feet from neighboring occupied buildings. Setbacks from property lines and neighboring occupied buildings may be waived if the adjoining owners consent in writing. The Nutrient Management Plan submitted by C & H Hog

Farms lists the Setback Requirements in Section B.13 and indicates the buffer zone on the maps in Section F. Furthermore, available acreage was determined by excluding the buffer zones from the total acreage, as shown in Section C.

- 19.** What are the nutrient levels (nitrogen and phosphorus) in the waste and soil? Is soil and waste analyzed before land application occurs?

Answer: In accordance with NPDES General Permit No. ARG590000 Part 4.2.1.3, “manure must be sampled at a minimum of once annually for nitrogen and phosphorus content, and soil must be analyzed a minimum of once every three years for phosphorus content.” The facility must keep records in accordance with NPDES General Permit No. ARG590000 Part 4.5, which includes maintaining records on results of manure and soil sampling as well as the test methods used to ensure that the methods used to analyze samples are consistent with University of Arkansas Extension recommendations.

Before each land application event, C & H Hog Farm recalculates the Phosphorus Index using phosphorus concentrations from the most recent waste and soil analyses to develop an application rate that will not exceed a rating of Low or Medium on the PI range. Generally, waste has a higher phosphorus concentration than nitrogen concentration; therefore, application rates of waste based on phosphorus will not exceed nitrogen requirements of cover crops. It may be necessary to add nitrogen based fertilizers to meet the nitrogen needs of the plant crops.

- 20.** Why is the Phosphorus Index used instead of a limit based on soil phosphorus?

Answer: Limits based solely on soil phosphorus do not account for other factors that influence phosphorus movement. A Phosphorus Index allows for other factors to be considered in determining the potential for phosphorus runoff. For a complete review of the Arkansas Phosphorus Index, the link to the Arkansas Phosphorus Index is provided in Frequently Asked Question No. 1. The Arkansas Phosphorus Index was adopted for use by both the Arkansas Natural Resources Commission and USDA Natural Resources Conservation Service for nutrient management in Arkansas.