

NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD

WASTE UTILIZATION  
(acre)  
CODE 633

**DEFINITION**

Using agricultural wastes such as manure and wastewater or other organic residues.

**PURPOSES**

- Protect water quality
- Provide fertility for crop, forage, fiber production and forest products
- Improve or maintain soil structure;
- Provide feedstock for livestock
- Provide a source of energy

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies where agricultural wastes including animal manure and contaminated water from livestock and poultry operations; solids and wastewater from municipal treatment plants; and agricultural processing residues are generated, and/or utilized.

**CRITERIA**

General criteria applicable to all purposes

All federal, state and local laws, rules and regulations governing waste management, pollution abatement, health and safety shall be strictly adhered to. The owner, operator or person receiving and applying animal manures shall be responsible for securing any and all required permits or approvals related to waste utilization, and for operating and maintaining any components in accordance with applicable laws and regulations.

Land application of animal manures in Nutrient Surplus Area shall comply with Arkansas

Natural Resources Commission Rules for Governing Animal Waste found in Title XX, XXI and XXII.

Use of agricultural wastes shall be based on at least one analysis of the material during the time it is to be used. In the case of daily spreading, the waste shall be sampled and analyzed at least once each year. As a minimum the waste analysis should identify nutrient and specific ion concentrations. Where the metal content of municipal wastewater, sludge, seepage, and other agricultural waste is of a concern, the analysis shall also include determining the concentration of metals in the material.

Where agricultural wastes are to be spread on land not owned or controlled by the producer, the waste management plan, as a minimum, shall document the amount of waste to be transferred and who will be responsible for the environmentally acceptable use of the waste.

Animal manure applied to agriculture land shall be applied in accordance with Cooperative Extension recommendations or the NRCS AWMFH. Application shall not exceed 3 Tons/Ac.

Records of the use of wastes shall be kept a minimum of five years as discussed in OPERATION AND MAINTENANCE, below.

Additional criteria to protect water quality

All agricultural waste shall be utilized in a manner that minimizes the opportunity for contamination of surface and ground water supplies.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact your Natural Resources Conservation Service State Office, or download it from the electronic Field Office Technical Guide for your state.

NRCS-AR  
December 2006

Agricultural waste shall not be land-applied on soils that are frequently flooded, as defined by the National Cooperative Soil Survey, during the period when flooding is expected.

When liquid wastes are applied, the application rate shall not exceed the infiltration rate of the soil, and the amount of waste applied shall not exceed the moisture holding capacity of the soil profile at the time of application. Wastes shall not be applied to frozen or snow-covered ground.

Additional criteria for providing fertility for crop, forage, fiber production and forest products

Where agricultural wastes are utilized to provide fertility for crop, forage, fiber production, and forest products, the practice standard Nutrient Management (590) shall be followed.

Where municipal wastewater and solids are applied to agricultural lands as a nutrient source, the single application or lifetime limits of heavy metals shall not be exceeded. The concentration of salts shall not exceed the level that will impair seed germination or plant growth.

**Additional criteria for improving or maintaining soil structure**

Wastes shall be applied at rates not to exceed the crop nutrient requirements or salt concentrations as stated above, and shall be applied at times the waste material can be incorporated by appropriate means into the soil within 72 hours of application.

**Additional criteria for providing feedstock for livestock**

Agricultural wastes to be used for feedstock shall be handled in a manner to minimize contamination and preserve its feed value. Chicken litter stored for this purpose shall be covered. Rations will be developed based on the University of Arkansas Cooperative Extension Service recommendations or other qualified animal nutritionist.

**Additional criteria for providing a source of energy**

Use of agricultural waste for energy production shall be an integral part of the overall waste management system.

All energy producing components of the system shall be included in the waste management plan and provisions for utilization of residues of energy production identified.

Where the residues of energy production are to be land-applied for crop nutrient use or soil conditioning, the criteria listed above shall apply.

**CONSIDERATIONS**

The effect of Waste Utilization on the water budget should be considered, particularly where a shallow ground water table is present or in areas prone to runoff. Limit waste application to the volume of liquid that can be stored in the root zone.

Minimize the impact of odors of land-applied wastes by making application at times when temperatures are cool and when wind direction is away from neighbors.

Agricultural wastes contain pathogens and other disease-causing organisms. Wastes should be utilized in a manner that minimizes their disease potential.

Priority areas for land application of wastes should be on gentle slopes located as far as possible from waterways. When wastes are applied on more sloping land or land adjacent to waterways, other conservation practices should be installed to reduce the potential for offsite transport of waste.

It is preferable to apply wastes on pastures and hay land soon after cutting or grazing before re-growth has occurred.

Reduce nitrogen volatilization losses associated with the land application of some waste by incorporation within 24 hours.

Minimize environmental impact of land-applied waste by limiting the quantity of waste applied to the rates determined using the practice standard Nutrient Management (590) for all waste utilization.

### PLANS AND SPECIFICATIONS

Plans and specifications for Waste Utilization shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. The waste management plan is to account for the utilization or other disposal of all animal wastes produced, and all waste application areas shall be clearly indicated on a plan map.

#### Specification for setback distances for buffer zones

On any manure spreading area (except where liquid wastes are applied) adjacent to streams, ponds, and lakes, and near critical landscape features such as spring seeps, sinkholes, wells, rock outcrops, and loosing streams, the setback distances will be:

Slope %	Setback Distance
0 - 2	20 ft.
>2 - <3	30 ft.
3 - 8	50 ft.
> 8	100 ft.

Where liquid waste is applied in accordance with the Arkansas Department of Environmental Quality Regulation No. 5. Application shall not be made within:

- 50 feet of property lines.
- 100 feet of seasonal or perennial streams, ponds, lakes, springs, sinkholes, rock outcrops, wells and water supplies.
- 300 feet of extraordinary resource waters, such as rock with cracks that extend from surface to ground water supply.
- 500 feet of neighboring occupied building.

Application shall not be made in areas where it is prohibited by Arkansas Department of Health Regulation for the protection of Public water supply.

### OPERATION AND MAINTENANCE

Records shall be kept for a period of five years or longer, and include when appropriate:

- Quantity of manure and other agricultural waste produced and their nutrient content
- Soil test results
- Dates and amounts of waste application where land applied, and the dates and amounts of waste removed from the system due to feeding, energy production, or export from the operation
- Waste application methods
- Crops grown and yields (both yield goals and measured yield)
- Other tests, such as determining the nutrient content of the harvested product
- Calibration of application equipment.

The operation and maintenance plan shall include the dates of periodic inspections and maintenance of equipment and facilities used in waste utilization. The plan should include what is to be inspected or maintained, and a general time frame for making necessary repairs.

### REFERENCES

State of Arkansas Department of Pollution Control and Ecology. 1992. Regulation No. 5, Section 6, Technical Requirements chapter 4 on page 4-1 (Rev. 3/99). Website: [www.adeq.state.ar.us](http://www.adeq.state.ar.us)

NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD

NUTRIENT MANAGEMENT

(Acre)  
CODE 590

**DEFINITION**

Managing the amount, source, placement, form and timing of the application of plant nutrients and soil amendments.

**PURPOSE**

- To budget and supply nutrients for plant production.
- To properly utilize manure or organic by-products as a plant nutrient source.
- To minimize agricultural nonpoint source pollution of surface and ground water resources.
- To protect air quality by reducing nitrogen and/or particulate emissions to the atmosphere.
- To maintain or improve the physical, chemical and biological condition of soil.

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies to all lands where plant nutrients and soil amendments are applied.

**CRITERIA**

**General Criteria Applicable to All Purposes**

Plans for nutrient management shall comply with all applicable Federal, state, and local laws and regulations.

Plans for nutrient management shall be developed in accordance with policy requirements of the NRCS General Manual Title 450, Part 401.03 (Technical Guides, Policy

and Responsibilities) and Title 190, Part 402 (Ecological Sciences, Nutrient Management, Policy); technical requirements of the NRCS Field Office Technical Guide (FOTG); procedures contained in the National Planning Procedures Handbook (NPPH), and the NRCS National Agronomy Manual (NAM) Section 503.

Persons who review or approve plans for nutrient management shall be certified through any certification program acceptable to NRCS within the state.

Plans for nutrient management that are elements of a more comprehensive conservation plan shall recognize other requirements of the conservation plan and be compatible with its other requirements.

A nutrient budget for nitrogen, phosphorus, and potassium shall be developed that considers all potential sources of nutrients including, but not limited to animal manure and organic by-products, waste water, commercial fertilizer, crop residues, legume credits, and irrigation water.

Realistic yield goals shall be established based on soil productivity information, historical yield data, climatic conditions, level of management and/or local research on similar soil, cropping systems, and soil and manure/organic by-products tests.

For new crops or varieties, industry yield recommendations may be used until documented yield information is available.

Plans for nutrient management shall specify the

NRCS, AR  
December, 2004

source, amount, timing and method of application of nutrients on each field to achieve realistic production goals, while minimizing nitrogen and/or phosphorus movement to surface and/or ground waters.

Erosion, runoff and water management controls shall be installed, as needed, on fields that receive nutrients.

**Soil Sampling and Laboratory Analysis (Testing).** Nutrient planning shall be based on current soil test results developed in accordance with University of Arkansas guidance or industry practice if recognized by the University of Arkansas. Current soil tests are those that are no older than three years.

Soil samples shall be collected and prepared according to the University of Arkansas guidance or standard industry practice. Soil test analyses shall be performed by laboratories that are accepted in one or more of the following programs:

- State Certified Programs, or
- The North American Proficiency Testing Program (Soil Science Society of America), or
- Laboratories whose tests are accepted by the University of Arkansas.

Soil testing shall include analysis for any nutrients for which specific information is needed to develop the nutrient plan. Request analyses pertinent to monitoring or amending the annual nutrient budget, e.g. pH, cation exchange capacity (CEC), electrical conductivity (EC), soil organic matter, nitrogen, phosphorus and potassium.

**Plant Tissue Testing.** Tissue sampling and testing, where used, shall be done in accordance with University of Arkansas standards or recommendations.

**Lime.** Soil amendments shall be applied, as needed, to adjust soil pH to the specific range of

NRCS, AR  
December, 2004

the crop for optimum availability and utilization of nutrients. Refer to University of Arkansas Cooperative Extension Publication FSA2118, "Understanding the Numbers on Your Soil Test Report" for the desired soil pH ranges for Arkansas crops.

Liming materials will be applied according to soil test results. Liming materials will be applied and incorporated prior to planting when inversion tillage is used to prepare a seedbed. Deep incorporation of lime will improve crop rooting depths, increase available nutrients, and improve crop yields. To establish a legume crop, lime should be applied three months prior to planting. Liming materials will be applied to established forages or no-till crop rotations as a surface application without incorporation.

**Nutrient Application Rates.** Recommended nutrient application rates shall be based on University of Arkansas recommendations (and/or industry practice when recognized by the university) that consider current soil test results, realistic yield goals and management capabilities. If the University of Arkansas does not provide specific recommendations, application shall be based on realistic yield goals and associated plant nutrient uptake rates.

The planned rates of nutrient application, as documented in the nutrient budget, shall be determined based on the following guidance:

- **Nitrogen Application - Planned** nitrogen application rates shall match the recommended rates as closely as possible, except when manure or other organic by-products are a source of nutrients. When manure or other organic by-products are a source of nutrients, see "Additional Criteria" below.
- **Phosphorus Application - Planned** phosphorus application rates shall match the recommended rates as closely as possible, except when manure or other organic by-products are source of

shall be maintained between 22° and 26° F.

**Capacity.** Freezer units shall be sized to accommodate the normal maximum volume of mortality to be expected in the interval between emptying. Volume calculations shall include the expected mortality rate of the animal, the period of time between emptying where mortality is given on a per day basis, the average weight of the animal between emptying, and a conversion factor for weight to volume. For broiler operations use a weight to volume conversion of a minimum of 45 pounds per cubic foot. Capacity calculations shall be supported by a removal schedule supplied by an integrator or approved vendor.

Average mortality shall be based on mortality data over several growing cycles (excluding catastrophic losses). Average mortality used to determine capacity shall be based on mortality data for the period of time prior to removal offsite. In the absence of specific landowner mortality data, mortality data shall be based on similar operations in the local area.

**Power Source.** E components and installation shall meet the requirements of the National Electrical Code (NEC) and state and local codes for outdoor installation. All electric wiring shall be in a conduit.

An alternative source of power, where available, shall be used to maintain the integrity of the freezing process during power outages. Where an alternative power source will not be available, the operation and maintenance plan shall contain contingencies for disposal of the poultry mortality.

#### **Incinerators.**

**General.** Incinerator must reduce carcass to ashes. Incinerators shall be dual burning Type 4 (human and animal remains) approved for use within the state.

**Capacity.** Minimum incinerator capacity shall be based on the average daily weight of animal mortality and the length of time the incinerator

will be operated each day..

**Location.** The incinerator shall be located a minimum of 20 feet or as recommended by the manufacturer from any structure. The incinerator shall be placed on a concrete pad with the fuel source as distant as practical. If the incinerator is covered with a roof, at least six inches are required between the incinerator chimney and any combustible roof parts.

#### **Criteria Applicable to All Purposes – Catastrophic Mortality**

**General.** Processes addressed by this standard shall be limited to burial and composting. Catastrophic mortality shall be collected as soon as practical and moved away from the production facility.

**Location.** The facility shall be located as far away from neighboring dwellings and the poultry or livestock operation as site conditions permit. Locate on sites with restricted percolation and a minimum of two feet between the bottom of the facility and the seasonal high water table unless special design features are incorporated that address seepage rates and non-encroachment of contaminants into the water table. Use AWMFH Appendix 10D for selection of sites where seepage will be restricted with normal construction techniques.

#### **Burial Pit**

**General.** Catastrophic mortality resulting from natural conditions such as temperature extremes shall be buried on-site or as otherwise directed by state and local regulatory agencies. Burial of catastrophic mortality shall be timed to minimize the effects of mortality expansion during early stages of the decay process. Where possible and permitted by state law, mortality shall remain uncovered or lightly covered until bloating has occurred, or methods employed to reduce or eliminate bloating. Topsoil shall be retained to re-grade the disposal site after the ground has settled as the decay process is

completed. Stockpiled soil shall be no closer than 20 feet from the edge of the burial pit.

**Size and Capacity.** Pits shall be sized to accommodate catastrophic mortality using appropriate weight to volume conversions. Capacity shall be in accordance with criteria acceptable to state and local regulatory agencies. The burial pit shall be a minimum of 4 feet wide with length necessary to accommodate mortality. Depth shall accommodate a minimum of 2 feet of cover over the mortality. Pit bottoms shall be relatively level. Lengths may be limited by soil suitability and slope. If more than one pit is required, they shall be separated by a minimum of three feet of undisturbed or compacted soil. The burial site shall be of sufficient volume to contain the mortality with a minimum of two feet of soil cover. The burial site shall be finish graded to slightly above natural ground elevation to accommodate settling.

**Structural Loading and Design.** Vehicular traffic shall not be allowed within four feet of the pit edge.

For pits that are four to five feet deep, a step or bench 18 inches wide and one foot deep will be dug around the perimeter of the main pit so the remaining vertical wall will not exceed four feet. For pits greater than five feet deep, the earthen wall shall be sloped back at 1 1/2 horizontal and 1 vertical or flatter.

Carcasses to be buried on special order of the state veterinarian Anthrax infected animals that die due to this disease shall be buried on site. Carcass must be covered with 1 inch of lime after being placed in ground.

#### Composting

**General.** Catastrophic mortality composting shall be in either passive piles or windrows as described in National Engineering Handbook Part 637, Chapter 2 - Composting (NEH 637.0210 and NEH 637.0211).

NRCS, AR  
April 2003

Composting mortality shall be protected from precipitation as necessary, or provisions made for collecting contaminated runoff. Static piles or windrows covered with sawdust, finished compost, or other benign material will not need further protection.

#### CONSIDERATIONS

Major considerations in planning animal mortality management are:

- Available equipment at the operation,
- The management capabilities of the operator,
- The degree of pollution control required by state and local agencies,
- The economics of the available alternatives, and
- Effect on neighbors.

Consideration should be given to prevailing wind direction and neighbors when siting animal mortality disposal facilities. A minimum of 900 feet should separate the facility from the nearest neighboring residence, and the facility should be 200 feet from a well, spring, or water course.

Runoff from the livestock or poultry facility, or from outside areas should be diverted away from the animal mortality disposal facility. Composting of poultry mortality will be hindered if the bird carcasses are allowed to freeze. Birds should be kept in a dry, non-freezing environment until added to the compost mix.

Facility sizes for composting large animal carcasses should reflect the longer compost periods required.

The following table lists factors that could be used in determining minimum daily weight of animal mortality when sizing incinerators:

TYPE OF ANIMAL	DAILY LOSS FACTOR (pounds/day/animal)
Chicken:	
Broilers	0.0024
Laying hens	0.0014

Breeding hens	0.0019
Breeder, male	0.0082
Turkeys:	
Hen	0.0081
Tom, light	0.0193
Tom, feather production	0.0286
Swine:	
Suckling pigs (per sow)	0.0400

Poultry operations often experience higher rates of mortality as the birds reach maturity. The capacity of incinerators should be sized to insure the mortality of the large birds can be handled within the time frame allowed for incineration.

An alternative to prevent bloating of catastrophic mortality die off could include opening animal thoracic and abdominal cavities and viscera prior to placing required cover.

Incineration produces varying quantities of ash that will need to be properly handled.

Vegetative screens and topography can be used to shield the animal disposal facility from public view, and to minimize visual impact.

State requirements for record keeping vary. Items such as burial site location, type and quantity of mortality, burial date, and other pertinent details should be noted at the time of burial.

Operators should maintain a list of current phone numbers for state and local officials to aid in notification if disease-related catastrophic mortality occurs.

Safety devices such as fencing, warning signs, and freezer locks may be necessary at certain sites.

Bio-security concerns should be addressed in all aspects of planning, installation, and operation

and maintenance of an Animal Mortality Facility.

Ground disturbing activities such as excavation and site preparation for disposal facilities have the potential to affect significant cultural resources.

## OPERATION AND MAINTENANCE

An operation and maintenance plan applicable to this practice that includes, but is not limited to, the items listed below will be developed with the operator, and will become a part of the overall waste management system plan. The requirements in the individual operation and maintenance plan shall be consistent with the practice purposes, intended life, and design criteria. Safety considerations shall be prominently displayed in the plan.

### *Normal Mortality*

Animal mortality facilities will normally be operated or used on a daily basis. At each operation or use, the facility shall be inspected to note any maintenance needs or indicators of operation problems.

### *Catastrophic Mortality*

Possible locations for catastrophic animal mortality facilities shall be located during the planning process to be operated as needed.

Burial of catastrophic mortality shall be timed to minimize the effects of mortality expansion during early stages of the decay process. Where possible and permitted by state law, mortality shall remain uncovered or lightly covered until bloating has occurred. Some topsoil shall be retained to re-grade the disposal site after the ground has settled as the decay process is largely completed.

Where composting is used for catastrophic mortality disposal, the operation and maintenance plan shall identify the most likely compost medium, possible compost recipes, operational information, and equipment that will

NRCS, AR  
April 2003



316 - 6

need to be readily available.

### PLANS AND SPECIFICATIONS

Plans and specifications for animal mortality facilities shall be in keeping with this standard and shall describe the requirements for applying this practice to achieve its intended purpose.

### REFERENCES

- Agricultural Waste Management Field Handbook (AWMFH)
- National Engineering Handbook, Part 637,

### Chapter 2, Composting

- NRCS GM 420 Part 401 -- Cultural Resources
- NRCS National Handbook of Conservation Practices
- ASTM C1227-00b Standard Specification for Pre-cast Septic Tanks
- NRCS AR Conservation Practice Standards
  - Access Road, Code 560
  - Composting Facility, Code 317
  - Critical Area Planting, Code 342
  - Waste Utilization, Code 313

NATURAL RESOURCES CONSERVATION SERVICE  
OPERATION AND MAINTENANCE

WASTE STORAGE FACILITY

(no.)

CODE 313

Landowner/Operator: C & C Hog Barn

Job Location: Newton County, Arkansas

Prepared By: Stacey Clark

Date: 4/21/2011

**OPERATION AND MAINTENANCE ITEMS**

Operation and maintenance (O&M) is necessary for all conservation practices and is required for all practices installed with the Natural Resources Conservation Service assistance. The land user is responsible for proper O&M throughout the life of the practice and as may be required by federal, state, or local laws or regulations.

Operation refers to operation of the practice in compliance with all laws, regulations, ordinances, and easements; and in such a manner that will result in the least adverse impact on the environment and will permit the practice to serve the purpose for which it was installed. Maintenance includes work to prevent deterioration of the practice, repairing damage, or replacing components which fail.

Necessary operation and maintenance items to include in plan are:

1. Inspect system weekly and after major storm events.
2. Inspect earthwork for signs of seepage, rodent damage, settlement, misalignment, or erosion and repair as needed.
3. Settlement or cracks in earthen sections must be investigated (to determine the cause) and repaired.
4. Inspect concrete for accelerated weathering, spalling, settlement, misalignment, or cracks. Repair defects.
5. Inspect rock riprap for accelerated weathering and displacement. Repair to original grades if necessary.
6. Inspect metal surfaces for rust and other damage. Especially inspect sections in contact with earthfill and/or other materials. Repair or replace damaged sections and apply a protective covering.
7. Prior to the storage season, empty the storage facility following the design. Apply waste according to the nutrient management plan and do not apply manure on saturated soil or frozen ground. Do not apply waste material immediately after a rain or within 12 hours of forecasted rain unless it can be immediately incorporated into the soil. Do not apply liquid at a rate that exceeds the soil intake rate.
8. The facility will be operated according to the plan and in such a way that the design freeboard will not be exceeded.
9. Confine travel of vehicles and livestock to designated areas to prevent erosion and enhance vegetation.
10. Maintain windbreaks or other visual or odor dispersive methods.
11. Poison gases are often heavier than air and may be trapped in closed waste storage structures. Do not allow human entry without safety equipment, including ladders and breathing apparatus. Maintain all lids, grates, and shields on openings to underground or enclosed structures.
12. Repair any rodent, burrowing animal, vandalism, vehicle, or livestock damage. Remove debris. Control rodents and insects as necessary.

13. Maintain all pumps, agitators, piping, valves, and all other electrical and mechanical equipment in good operating condition following electrical codes and manufacturers' recommendations. Inspect and repair grounding rods, switches, and wiring.

14. Make sure all structure drains are functional and soil is not being transported through the drainage system. Screens and/or rodent guards must be maintained and in place.

15. Maintain vigorous growth of vegetative coverings. This includes reseeding, fertilization, and application of herbicides when necessary. Periodic mowing may also be needed.

16. Fences, railings, and warning signs must be maintained to provide warning and prevent unauthorized entry.

17. Other: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

NATURAL RESOURCES CONSERVATION SERVICE  
OPERATION AND MAINTENANCE

WASTE UTILIZATION  
(acre)  
CODE 633

Landowner/Operator: C & C Hog Barn

Job Location: Newton County, Arkansas

Prepared By: Stacey Clark Date: 4/21/2011

**OPERATION AND MAINTENANCE ITEMS**

Operation and maintenance (O&M) is necessary for all conservation practices and is required for all practices installed with the Natural Resources Conservation Service assistance. The land user is responsible for proper O&M throughout the life of the practice and as may be required by federal, state, or local laws or regulations.

Operation refers to operation of the practice in compliance with all laws, regulations, ordinances, and easements; and in such a manner that will result in the least adverse impact on the environment and will permit the practice to serve the purpose for which it was installed. Maintenance includes work to prevent deterioration of the practice, repairing damage, or replacing components which fail.

Necessary operation and maintenance items to include in plan are:

Records shall be kept for a period of five years or longer, and include when appropriate:

1. Quantity of manure and other agricultural waste produced and their nutrient content
2. Soil test results
3. Dates and amounts of waste application where land applied, and the dates and amounts of waste removed from the system due to feeding, energy production, or export from the operation
4. Waste application methods
5. Crops grown and yields (both yield goals and measured yield)
6. Other tests, such as determining the nutrient content of the harvested product
7. Calibration of application equipment.
8. Dates of periodic inspections and maintenance of equipment and facilities used in waste utilization.

9. Other: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

OPERATION AND MAINTENANCE

ANIMAL MORTALITY FACILITY

(No.)

CODE 316

Landowner/Operator: C & C Hog Barn

Job Location: Newton County, Arkansas

Prepared By: Stacey Clark Date: 4/21/2011

**OPERATION AND MAINTENANCE ITEMS**

Operation and maintenance (O&M) is necessary for all conservation practices and is required for all practices installed with the Natural Resources Conservation Service assistance. The land user is responsible for proper O&M throughout the life of the practice and as may be required by federal, state, or local laws or regulations.

Operation refers to operation of the practice in compliance with all laws, regulations, ordinances, and easements; and in such a manner that will result in the least adverse impact on the environment and will permit the practice to serve the purpose for which it was installed. Maintenance includes work to prevent deterioration of the practice, repairing damage, or replacing components which fail.

Necessary operation and maintenance items to include in plan:

***Normal Mortality***

Animal mortality facilities will normally be operated or used on a daily basis. At each operation or use, the facility shall be inspected to note any maintenance needs or indicators of operation problems.

***Catastrophic Mortality***

Possible locations for catastrophic animal mortality facilities shall be located during the planning process to be operated as needed.

Burial of catastrophic mortality shall be timed to minimize the effects of mortality expansion during early stages of the decay process. Where possible and permitted by state law, mortality shall remain uncovered or lightly covered until bloating has occurred. Some topsoil shall be retained to re-grade the disposal site after the ground has settled as the decay process is largely completed.

Where composting is used for catastrophic mortality disposal, the operation and maintenance plan shall identify the most likely compost medium, possible compost recipes, operational information, and equipment that will need to be readily available.

Other: \_\_\_\_\_

\_\_\_\_\_

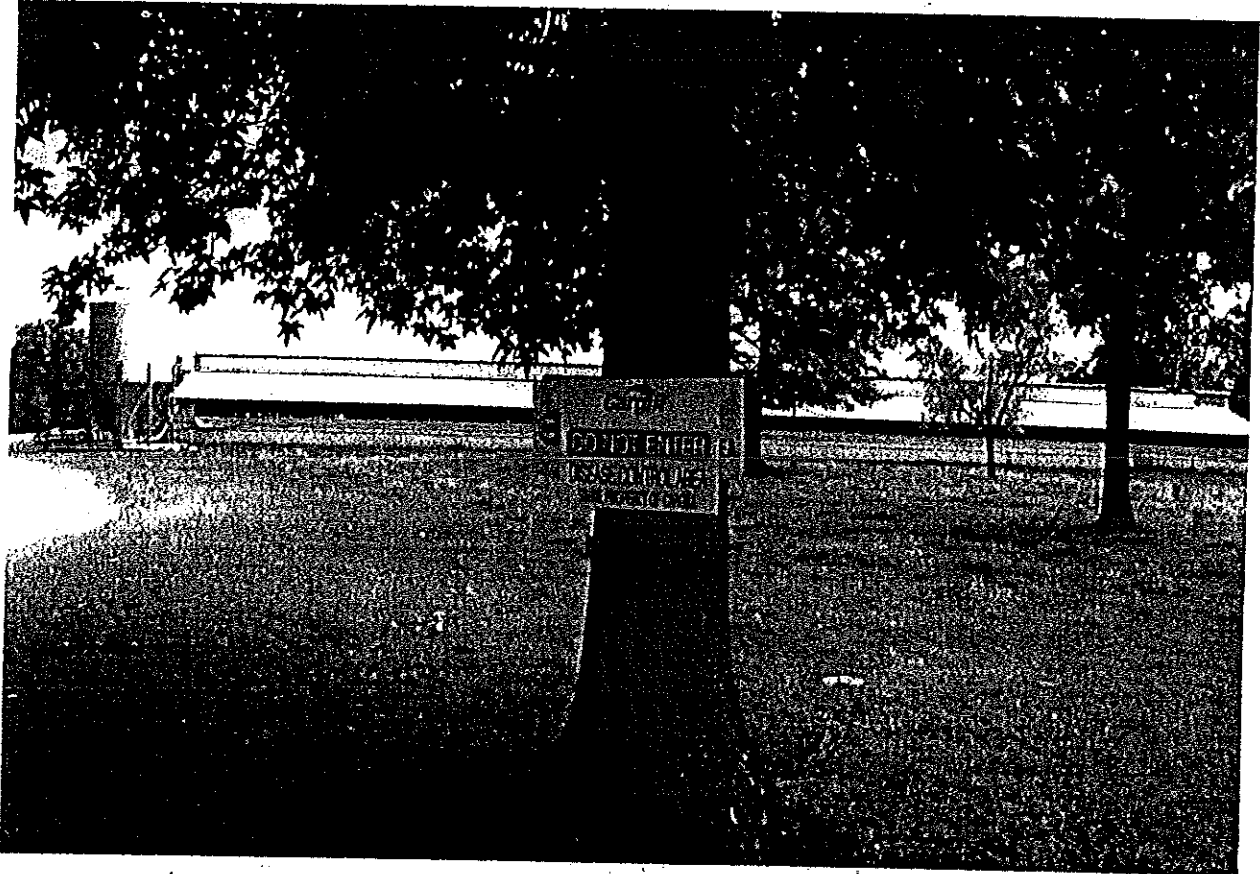
\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

### Section 3 FARMSTEAD SAFETY AND SECURITY

Emergency response plan  
Biosecurity measures and biosecurity plan  
Catastrophic mortality plan  
Odor and pathogen management  
EPA agreed-to chemical handling check list



## SECTION 3 – EMERGENCY RESPONSE PLAN

### **In Case of an Emergency Storage Facility Spill, Leak or Failure:**

Implement the following first containment steps:

- a) Stop all other activities to address the emergency.
- b) Stop all flow into the storage structures.
- c) Assess the extent of the emergency and determine how much help is needed.
- d) Call for help and excavator if needed.
- e) Use a dozer or tractor with a blade to contain or divert spill or leak, if possible.
- f) If containment material is needed, excavate soil from the nearest available area to the storage facility.
- g) If possible, begin pumping manure and spreading in the prescribed fields at the prescribed rates.
- h) Complete the clean-up and repair the necessary components.

### **In Case of an Emergency Land Application Manure/Waste Discharge:**

Implement the following first containment steps:

- a) Stop all other activities to address the emergency.
- b) Stop manure pumps and irrigation equipment. Close valves. Separate pipes to create air gap, if necessary, to stop the manure flow.
- c) Assess the extent of the emergency and determine how much help is needed.
- d) Call for help if needed.
- e) If spilled on a roadway, call the sheriff's office for traffic control and clean the spill immediately from the road and roadside, if needed.
- f) Contain the spill or runoff from entering streams or waterways by using hay bales, saw dust, or soil material.
- g) If flow is coming from a pipe, plug immediately.
- h) Prevent further runoff by incorporating the wastes.

In the event of an emergency concerning natural disaster, fire, personal injury, manure storage and handling, and land application operations contact the appropriate emergency agency official(s). Emergency shutdown procedures should be readily available for all machinery and equipment.

#### **Emergency Contact Information:**

<b>Contact</b>	<b>Telephone Number</b>
Farm Owner	Richard Campbell: 870-434-5974
Fire or Ambulance	(870) 446-5124
Newton County Sheriff	(870) 446-5124
Arkansas Livestock & Poultry Commission	(501) 907-2400
Arkansas Dept. of Environmental Quality	(501) 682-0744
Arkansas Natural Resources Commission	(501) 682-1611
Newton County Emergency Management	(870) 446-5124
Newton County Health Department	(870) 446-2216
Natural Resources Conservation Service, Harrison Field Serv. Center	(870) 741-8600 Ext. 3

**C & C Hog Barn  
Newton County, Arkansas  
October 12, 2010**

**General Biosecurity Measures for On-site Visits**

Biosecurity is a plan developed to keep livestock operations safe from infectious agents. The producer is responsible for biosecurity program that exists on his/her farm.

Biological security measures are utilized on the C & C Hog Barn. These controls are designed to minimize the risk of disease introduction and spread to his operation during site visits. To address these concerns, the following steps must be taken to ensure a reasonable level of biosecurity. Due to unforeseen circumstances, Mr. Campbell may require more stringent biosecurity measures at the time of visitation.

**Minimum Biosecurity Measures**

- Avoid livestock areas, unless it is necessary to complete the goal of the visit.
- Park vehicle on paved or concrete areas away from production sites on farm to avoid contact with dirt, mud, or manure. If not possible, be certain that tires are free of dirt and debris by hosing the tires and wheels before leaving the premises. If this does not clean the tires adequately, take the vehicle to a nearby pressure wash.
- Wash hands with soap and water or an antibacterial gel before entering and after leaving the premises to avoid transmitting disease agents from person to person.
- Any person infected with a contagious disease (i.e. common cold, influenza, pneumonia) should not visit farm.
- Any person that has been on another swine farm within 24 hours should not visit farm without permission from producer.
- Any person that has been overseas within the last 45 days will not be permitted on farm without written permission signed by producer.
- All persons planning to visit C & C Hog Barn must first receive permission.
- Any person that has been in contact with other swine will not be permitted on farm without permission from producer.
- All persons visiting farm with 24-hour notice must be preapproved; all others must wait 72 hours.
- All vehicles should be disinfected before entering production site.
- Signs will be posted at the C & C Hog Barn designating Biosecure Areas.
- Producer should maintain a visitor's log.
- All persons requesting permission to visit the C & C Hog Barn should complete a questionnaire (see attachment 1).
- All visitors will be escorted by Richard or Phillip Campbell unless granted prior permission.

**Biosecurity Levels**

Routine levels of biosecurity measures are described below. When in doubt as to which levels of biosecurity is needed, use the next higher level. These steps should be repeated for each visit.



**Level 1** - Visit to farm that entails office or home visit only and not production site. No contact with livestock or their housing (including pet horse or work dog).

- Use the minimum measures outlined above.
- Pre-approval will be granted for Level 1 only (see attachment 2).
- All pre-approved, must receive basic biosecurity training.

**Level 2** - Visits to farms or ranches where minimal contact with livestock or their housing (barns, pens, hutches, etc.) is unavoidable to attain the goal of the visit, i.e. property appraisals, electrical wiring, plumbing tour of production facilities. Contact involves walking through animal housing or pastures where the animals are not within reach.

- Apply minimum biosecurity measures plus
- Immediately put on clean rubber boots or new plastic boots upon exiting the vehicle.
- After returning to your vehicle, clean and disinfect any equipment used with a brush and approved Environmental Protection Agency (EPA) disinfectant solution (see listed supplies).
- Clean rubber boots with an approved EPA disinfectant diluted with water. Scrub the bottoms of the boots with a brush to remove all dirt or debris. Dispose of disinfectant solution according to label. Unused disinfectant solution should not be discarded on ground.
- If wearing plastic boots, place them in a plastic bag that should be left on the premises for the owner/producer for disposal or place in a designated "dirty" area of your vehicle.
- Dispose of disinfectant solution according to the label. Unused disinfectant solution should not be discarded on ground.

**Level 3** - Visits to farms/ranches where there will be close contact with livestock. This includes contact such as walking through narrowly confined pens/lots where animals are within reach or actually handling/inspecting the animals.

- Pre-plan the needed supplies and clothing for daily visits. Use a pair of clean coveralls for each premise.
- Designate a "dirty" area in your vehicle for clothing and equipment that has been used on the farm.
- Park vehicles on paved or concrete surfaces away from production facilities. Put on clean coveralls and rubber boots immediately upon exiting the vehicle.
- After returning to vehicle, clean and disinfect all equipment used (including eyewear) and place all disposable supplies in a plastic bag to leave with the owner/producer for disposal. If not possible, place plastic bag in the "dirty" area of the vehicle and dispose of it in a manner that prevents exposure to other livestock.
- Clean rubber boots with an approved EPA disinfectant diluted with water. Scrub the bottoms of the boots with a brush to remove all dirt or debris. Dispose of disinfectant solution according to the label. Unused disinfectant solution should not be discarded on ground.
- Remove coveralls so that they are inside out and place in a garbage bag.
- Place the clean equipment and boots in designated "clean" area of the vehicle.
- If the vehicle was not parked on a paved surface, wash vehicle tires and wheel wells to remove dirt and debris at a nearby car wash.
- At the end of the day, dispose of all plastic bags that contain supplies in a manner that prevents exposure to other livestock. Launder all coveralls. Personal hygiene should include shampooing hair and cleaning under fingernails.

## Supplies

Supplies, as needed depending on biosecurity level, should be purchased and kept on-site for use at all times.

1. Coveralls - Cloth or Tyvex
2. Boots - Rubber or disposable plastic boots
3. Latex exam gloves
4. Large water container
5. EPA approved disinfectant-Virkon-S, Oxonia Active/Oxcept 333
6. Long handled brush
7. Paper towels
8. Spray bottle w/water
9. Hand Held Sprayer
10. Liquid and/or gel antibacterial soap
- II. Bucket pail
12. Mask (N-95 minimum)
13. Hair net, hand disinfectant

**C & C Hog Barn Biosecurity Plan Questionnaire Protocol**

Date: \_\_\_\_\_

Visitor Name: \_\_\_\_\_  
Last First

1. What is the purpose of your visit? \_\_\_\_\_
2. What is the estimated duration of your visit? \_\_\_\_\_
3. Do you have a contagious disease (i.e. common cold, influenza)? YES NO
5. Have you been on another farm within the last 24 hours? YES NO
6. Have you been over seas in the last 45 days? YES NO
7. Have you been on another swine farm within the last 24 hours? YES NO
8. Have you been in contact with swine within the last 72 hours? YES NO
9. Do you work in an industry that includes exposure to swine? YES NO
10. Do you understand the minimum biosecurity measures? YES NO
11. Can you comply with minimum biosecurity measures? YES NO
12. Have you traveled by plane during the last 72 hours? YES NO

Any person visiting the Paul Hostetler Farm must comply with minimum Biosecurity Measures.

**Biosecurity Plan Signature Page**

This Biosecurity Plan was prepared January 16, 2009, in accordance to NRCS GM Policy Title 130 - Agency General: Part 403, Subpart H - Biosecurity Preparedness & Response. We the undersigned have reviewed this document and concur with the contents.

Name: \_\_\_\_\_

NRCS/CD Representative

Title: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**Owner/ Operator**

We the undersigned have reviewed this document and approve its contents.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Owner

**Pre-Approved List**

The following persons may need to enter C & C Hog Barn with less than a 24-hour notice. All the persons will adhere to Minimum Biosecurity Measures.

- Contractors
- Veterinarians
- Feed Haulers
- Employees
- Electric Utilities Employees
- Water Company Employees
- Any person needing to visit farm on a routine basis

nutrients. When manure or other organic by-products are a source of nutrients, see "Additional Criteria" below.

- **Potassium Application** - Excess potassium shall not be applied in situations in which it causes unacceptable nutrient imbalances in crops or forages. When forage quality is an issue associated with excess potassium application, state standards shall be used to set forage quality guidelines.
- **Other Plant Nutrients** - The planned rates of application of other nutrients shall be consistent with University of Arkansas guidance or industry practice if recognized by the University of Arkansas.
- **Starter Fertilizers** - Starter fertilizers containing nitrogen, phosphorus and potassium may be applied in accordance with University of Arkansas recommendations, or industry practice if recognized by the University of Arkansas. When starter fertilizers are used, they shall be included in the nutrient budget.

**Nutrient Application Timing.** Timing and method of nutrient application (particularly nitrogen) shall correspond as closely as possible with plant nutrient uptake characteristics, while considering cropping system limitations, weather and climatic conditions, and field accessibility.

**Nutrient Application Methods.** Nutrients shall not be applied to frozen, snow-covered or saturated soil if the potential risk for runoff exists.

Nutrient applications associated with irrigation systems shall be applied in accordance with the requirements of Irrigation Water Management (Code 449).

#### Additional Criteria Applicable to Manure or Organic By-Products Applied as a Plant Nutrient Source

Nutrient values of manure and organic by-products (excluding sewage sludge) shall be determined prior to land application based on laboratory analysis, acceptable "book values" recognized by the NRCS and/or the University of Arkansas, or historic records for the operation, if they accurately estimate the nutrient content of the material. Book values recognized by NRCS may be found in the Agricultural Waste Management Field Handbook, Chapter 4 - Agricultural Waste Characteristics.

**Nutrient Application Rates.** The application rate (in/lr) for material applied through irrigation shall not exceed the soil intake/infiltration rate. The total application shall not exceed the field capacity of the soil.

The planned rates of nitrogen and phosphorus application recorded in the plan shall be determined based on the phosphorus index (PI) rating. For the phosphorus index for Arkansas, refer to "Phosphorus Index for Pastures" filed in section II of the FOTG in the soil and site information part of the manual behind the water quantity and quality tab.

- **Nitrogen Application.** Manure or other organic by-products may be applied at rates to meet the crop's nitrogen needs when the PI rating is Low or Medium. If lower rates of manure are applied, an additional nitrogen application, from non-organic sources, may be required to supply the recommended amounts of nitrogen. Manure or other organic by-products may be applied on legumes at rates equal to the estimated removal of nitrogen in harvested plant biomass.

- **Phosphorus Application.** Manure or other organic by-products shall be applied at rates to meet the crop's phosphorus needs when the PI rating is High.
- **No Application.** There will be no manure application on sites with a PI rating of Very High. Mitigation or management practices will be encouraged on these sites to reduce the potential risk of runoff. A single application of phosphorus applied as manure may be made at a rate equal to the recommended phosphorus application or estimated phosphorus removal in harvested plant biomass for the crop rotation or multiple years in the crop sequence (based on three-year average for grassland). When such applications are made, the application rate shall:
  - not exceed the recommended nitrogen application rate during the year of application, or
  - not exceed the estimated nitrogen removal in harvested plant biomass during the year of application when there is no recommended nitrogen application.
  - not be made on sites considered vulnerable to off-site phosphorus transport unless appropriate conservation practices, best management practices or management activities are used to reduce the vulnerability to phosphorus runoff.

Where planned application rates of manure for a field are 1 ton or less, the application rate may be met by applying larger rates in strips. Those strips must alternate evenly between application sites and non-application sites and result in the correct average per acre application rate for the field. For example, a rate of 1/2 ton per acre can be met by applying 1 ton per acre in evenly spaced strips that result in application to only one half of the acres in the field.

NRCS, AR  
December, 2004

**Field Risk Assessment.** When animal manures or other organic by-products are applied, a field-specific assessment of the potential for phosphorus transport from the field shall be completed. This assessment may be done using the Phosphorus Index. In such cases, plans shall include:

- a record of the assessment rating for each field or sub-field, and
- information about conservation practices and management activities that can reduce the potential for phosphorus movement from the site.

When such assessments are done, the results of the assessment and recommendations shall be discussed with the producer during the development of the plan.

**Heavy Metals Monitoring.** When sewage sludge is applied, the accumulation of potential pollutants (including arsenic, cadmium, copper, lead, mercury, selenium, and zinc) in the soil shall be monitored in accordance with the US Code, Reference 40 CFR, Parts 403 and 503, and/or any applicable state and local laws or regulations.

#### Additional Criteria to Minimize Agricultural Non-point Source Pollution of Surface and Ground Water Resources

In areas with an identified or designated nutrient-related water quality impairment, an assessment shall be completed of the potential for nitrogen and/or phosphorus transport from the field. The Phosphorus Index (PI) shall be used for pastureland and the Leaching Index (LI) shall be used for cropland to make these assessments. The results of these assessments and recommendations shall be discussed with the producer and included in the plan.

Plans developed to minimize agricultural nonpoint source pollution of surface or ground water resources shall include practices and/or management activities that can reduce the risk

of nitrogen or phosphorus movement from the field.

**Additional Criteria to Protect Air Quality by Reducing Nitrogen and/or Particulate Emissions to the Atmosphere**

Incorporate surface applications of solid forms of manure or some commercial fertilizer nitrogen formulations (i.e. Urea) into the soil within 24 hours of application.

When applying liquid forms of manure with irrigation equipment select application conditions when there is high humidity, little/no wind blowing, a forth coming rainfall event, and/or other conditions that will minimize volatilization losses into the atmosphere. The basis for applying manure under these conditions shall be documented in the nutrient management plan.

Handle and apply poultry litter or other dry types of animal manures when weather conditions are calm and there is less potential for blowing and emission of particulates into the atmosphere. The basis for applying manure under these conditions shall be documented in the nutrient management plan.

**Additional Criteria to Improve the Physical, Chemical, and Biological Condition of the Soil**

Nutrients shall be applied in such a manner as not to degrade the soil's structure, chemical properties or biological condition. Use of nutrient sources with high salt content will be minimized unless provisions are used to leach salts below the crop root zone.

Nutrients shall not be applied to flooded or saturated soils when the potential for soil compaction and creation of ruts is high.

**CONSIDERATIONS**

Excessive levels of some nutrients can cause

induced deficiencies of other nutrients.

Consider additional practices such as Conservation Cover (327), Grassed Waterway (412), Contour Buffer Strips (332), Filter Strips (393), Irrigation Water Management (449), Riparian Forest Buffer (391A), Conservation Crop Rotation (328), Cover and Green Manure (340), and Residue Management (329A, 329B, or 329C, and 344) to improve soil nutrient and water storage, infiltration, aeration, tilth, diversity of soil organisms and to protect or improve water and air quality.

Use of cover crops whenever possible to utilize and recycle residual nitrogen.

Consider application methods and timing that reduce the risk of nutrients being transported to ground and surface waters, or into the atmosphere. Suggestions include:

- split applications of nitrogen to provide nutrients at the times of maximum crop utilization,
- avoiding winter nutrient application for spring seeded crops,
- band applications of phosphorus near the seed row,
- applying nutrient materials uniformly to application areas or as prescribed by precision agricultural techniques, and/or
- immediate incorporation of land applied manures or organic by-products,
- delaying field application of animal manures or other organic by-products if precipitation capable of producing runoff and erosion is forecast within 24 hours of the time of the planned application.

Consider minimum application setback distances from environmentally sensitive areas, such as sinkholes, wells, gullies, ditches, surface inlets or rapidly permeable soil areas.

The potential problems from odors associated with the land application of animal manures,



especially when applied near or upwind of residences.

Consider nitrogen volatilization losses associated with the land application of animal manures. Volatilization losses can become significant, if manure is not immediately incorporated into the soil after application.

The potential to affect National Register listed or eligible cultural resources.

Consider using soil test information no older than one year when developing new plans, particularly if animal manures are to be a nutrient source.

Consider annual reviews to determine if changes in the nutrient budget are desirable (or needed) for the next planned crop.

On sites on which there are special environmental concerns, consider other sampling techniques. (For example: Soil profile sampling for nitrogen, Pre-Sidedress Nitrogen Test (PSNT), Pre-Plant Soil Nitrate Test (PPSN) or soil surface sampling for phosphorus accumulation or pH changes.)

Consider ways to modify the chemistry of animal manure, including modification of the animal's diet to reduce the manure nutrient content, to enhance the producer's ability to manage manure effectively.

Using products or materials (e.g. nitrification inhibitors) that slow the conversion of nitrogen in manure or fertilizer into forms that move rapidly in the soil or into the atmosphere, and that reduce the potential for losses into water or air.

When applying manure with irrigation equipment, modification of the equipment can reduce the potential for volatilization of nitrogen from the time the manure leaves the application equipment until it reaches the

surface of the soil (e.g. drop down tubes for center pivots). N volatilization from manure in a surface irrigation system will be reduced when applied under a crop canopy.

Consider the combined effects of nutrient application methods and other tillage operations on greenhouse gas emissions (e.g. nitrous oxide  $N_2O$ , carbon dioxide  $CO_2$ ), and potential for carbon sequestration.

## PLANS AND SPECIFICATIONS

Plans and specifications shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose(s), using nutrients to achieve production goals and to prevent or minimize water quality impairment.

The following components shall be included in the nutrient management plan:

- aerial photograph or map and a soil map of the site,
- current and/or planned crop rotation or plant production sequence,
- results of soil, plant, water, manure or organic by-product sample analyses,
- realistic yield goals for the crops in the rotation,
- quantification of all nutrient sources,
- recommended nutrient rates, timing, form, and method of application and incorporation,
- location of designated sensitive areas or resources and the associated, nutrient management restriction,
- guidance for implementation, operation, maintenance, recordkeeping, and
- complete nutrient budget for nitrogen, phosphorus, and potassium for the rotation or crop sequence.
- If increases in soil phosphorus levels are expected, plans shall document:
- the soil phosphorus levels at which it may be desirable to convert to phosphorus based implementation,

- the relationship between soil phosphorus levels and potential for phosphorus transport from the field, and
- the potential for soil phosphorus drawdown from the production and harvesting of crops.
- When applicable, plans shall include other practices or management activities as determined by specific regulation, program requirements or producer goals.
- In addition to the requirements described above, plans for nutrient management shall also include:
  - discussion about the relationship between nitrogen and phosphorus transport and water quality impairment. The discussion about nitrogen should include information about nitrogen leaching into shallow ground water and potential health impacts. The discussion about phosphorus should include information about phosphorus accumulation in the soil, the increased potential for phosphorus transport in soluble form, and the types of water quality impairment that could result from phosphorus movement into surface water bodies.
  - discussion about how the plan is intended to prevent the nutrients (nitrogen and phosphorus) supplied for production purposes from contributing to water quality impairment.
  - a statement that the plan was developed based on the requirements of the current standard and any applicable Federal, state, or local regulations or policies; and that changes in any of these requirements may necessitate a revision of the plan.
  - the basis for the decisions for applying liquid or solid forms of manure with the intent of reducing nitrogen or particulate emissions to the atmosphere.

## OPERATION AND MAINTENANCE

The owner/client is responsible for safe operation and maintenance of this practice including all equipment. Operation and maintenance addresses the following:

- periodic plan review to determine if adjustments or modifications to the plan are needed. As a minimum, plans will be reviewed and revised with each soil test cycle.
- protection of fertilizer and organic by-product storage facilities from weather and accidental leakage or spillage.
- calibration of application equipment to ensure uniform distribution of material at planned rates.
- documentation of the actual rate at which nutrients were applied. When the actual rates used differ from or exceed the recommended and planned rates, records will indicate the reasons for the differences.
- Maintaining records to document plan implementation. As applicable, records include:
  - soil test results and recommendations for nutrient application,
  - quantities, analyses and sources of nutrients applied,
  - dates and method of nutrient applications,
  - weather conditions at the time of application and time until a rainfall event occurred after application. (applicable only to situations when air quality issues are being addressed in the plan)
  - crops planted, planting and harvest dates, yields, and crop residues removed,
  - results of water, plant, and organic by-product analyses, and
  - dates of review and person performing the review, and recommendations that resulted from the review.

Records should be maintained for five years, or for a period longer than five years if required by other Federal, state, or local ordinances, or program or contract requirements.

Workers should be protected from and avoid unnecessary contact with chemical fertilizers and organic by-products. Protection should include the use of protective clothing when working with plant nutrients. Extra caution must be taken when handling ammonia sources of nutrients, or when dealing with organic

wastes stored in unventilated enclosures. The disposal of material generated by the cleaning nutrient application equipment should be accomplished properly. Excess material should be collected and stored or field applied in an appropriate manner. Excess material should not be applied on areas of high potential risk for runoff and leaching.

The disposal or recycling of nutrient containers should be done according to state and local guidelines or regulations.

NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD

ANIMAL MORTALITY FACILITY

(No.)  
CODE 316

**DEFINITION**

An on-farm facility for the treatment or disposal of livestock and poultry carcasses.

**PURPOSE**

This practice may be applied as part of a conservation management system to support one or more of the following purposes:

- Decrease non-point source pollution of surface and groundwater resources,
- Reduce the impact of odors that result from improperly handled animal mortality,
- Decrease the likelihood of the spread of disease or other pathogens that result from the interaction of animal mortality and predators,
- To provide contingencies for normal mortality events,
- To provide contingencies for catastrophic mortality events.

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies where animal carcass treatment or disposal must be considered as a component of a waste management system for livestock or poultry operations. It applies where federal, state, and local laws, rules, and regulations permit on-farm carcass treatment and disposal. It also applies where a waste management system plan as described in the National Engineering Handbook (NEH), Part 651, Agricultural Waste Management Field Handbook (AWMFH) has been developed that accounts for the end use of the product from the mortality facility. This practice includes disposal of both normal and catastrophic animal

mortality; however, it does not apply to catastrophic mortality resulting from disease.

**CRITERIA**

General Criteria Applicable to All Purposes

The facility shall be designed to handle normal mortality and/or catastrophic mortality.

The planning and design of animal mortality facilities or processes must conform to all federal, State and local laws, rules and regulations. This includes provisions for closing and/or removing the facility where required.

All structural components integral to animal mortality management shall meet the structural loads and design criteria as described in NRCS conservation practice standard 313, Waste Storage Facility, unless otherwise designated.

Where an animal mortality facility can be damaged by surface runoff, the runoff shall be diverted away from the facility.

**Location.** The location shall minimize the impact of the facility on odor and other air quality issues affecting neighboring residences, as well as minimizing the impact of the facility on surface and ground water resources. In addition, the facility, where practical, shall be generally down gradient from a spring or well.

The location of the animal mortality facility shall be consistent with the overall site plan for the livestock or poultry operation.

**Protection.** The animal mortality facility shall be located above the 25-yr flood plain; however  
NRCS, AR  
April 2003

316 - 2

if site restrictions require location within a floodplain, the facility shall be protected from inundation or damage.

The animal mortality facility shall be located a sufficient height above normal ground to prevent surface water from ponding and posing a problem in the loading and unloading of the facility. The site shall be graded to drain or divert all overland runoff from the structure and surrounding work area in a manner not to cause pollution and erosion.

**Seepage Control.** Where seepage from mortality facilities will create a potential water quality problem and it is deemed necessary to reduce seepage, use AWMFH, Appendix 10D, for clay liner design criteria, or other acceptable liner technology.

#### Criteria Applicable to All Purposes – Normal Mortality

The facility shall be located as close to the source of mortality as practical, considering bio-security issues and the need to keep the facility out of sight of the general public.

**Vegetation.** All disturbed areas shall be vegetated in accordance with NRCS conservation standard Critical Area Planting, code 342.

#### **Composters.**

**General.** Design of facilities for composting animal mortality shall conform to conservation practice standard 317, Composting Facility, or the guidance in National Engineering Handbook Part 637, Chapter 2 – Composting (NEH 637.0211, Dead Animal Composting).

#### Freezers.

**General.** There must be a vendor capable of safely collecting and transporting the carcasses from the farm to the recycling or rendering plant. The Arkansas Livestock and Poultry Commission must approve the vendor used for removing frozen animal carcasses from the

farm. The landowner must have a written contract with the vendor stating the vendor's responsibility for properly handling animal mortality from the farm. The schedule for removing the dead animals must coincide with the freezer capacity.

**Location.** Freezers shall be located near all-weather roads to facilitate the loading and transporting of carcasses from the farm. Where needed, all-weather roads shall be constructed to facilitate the equipment used in the removal of carcasses from the freezers. All-weather roads shall meet the requirements of NRCS conservation practice standard Access Road, Code 560.

**Structural loading and Design.** Freezer units shall be of the chest type with a construction compatible with the mechanism to be used to empty the freezer. Provisions for protecting the freezer unit from precipitation and direct sun shall be made as deemed appropriate.

The freezer unit design, construction, power source, and unit installation shall be in accordance with manufacturer's recommendations. Freezers shall be constructed of durable material with a life expectancy compatible with other aspects of the waste management system. The freezer container shall be leak proof to minimize odor and leachate pollution.

To provide for structure stability and safety, the freezer shall be located on a firm foundation consisting of an earthen, gravel, limestone, timber, or concrete pad as recommended by the manufacturer. Where needed, the freezer will be placed on a pad of suitable strength to withstand loads imposed with vehicular traffic consistent with equipment used to load or remove the box or tray.

**Temperature.** The freezers shall be self-contained units designed to freeze animal carcasses before decomposition occurs. For best results, the temperature of the carcasses



## Subpart H - Biosecurity Preparedness & Response

### 403.80 Purpose

To provide policy for all NRCS employees on implementing proper biosecurity measures.

### 403.81 General

The threat of infectious animal diseases, such as foot and mouth and Johne's disease, to the Nation's food supply is real. This threat is a national concern requiring the cooperative involvement of many USDA agencies and partners.

### 403.82 Background

The National Food and Agriculture Council (NFAC) have issued guidelines for all USDA employees to follow to minimize the risk and to prevent the spread of infectious diseases from livestock and poultry. The NFAC also provides coordination of USDA's biosecurity activities among all department agencies, with the Animal and Plant Health Inspection Service (APHIS) taking the lead and providing technical guidance. This information is maintained on the APHIS Web site (<http://www.aphis.usda.gov>), which can be accessed through the USDA homepage.

### 403.83 Authorities

This policy is based on and addresses the following authorities:

- The Defense Production Act of 1950 (50 USC App. 2061 et seq) •
- Executive Order 12858 - Assignment of Emergency Preparedness Responsibilities

### 403.84 Policy

(a) During periods of outbreak of infectious animal diseases, NRCS employees shall not enter affected areas for normal planning and implementation purposes. Entry to those areas shall only be made in response to a request from the State Veterinarian or other responsible official in order to provide guidance and assistance for mortality disposal. In those situations, biosecurity measures as directed by the responsible official shall be followed.

(b) NRCS employees will adhere to Level I biosecurity measures at all times or more stringent measures that farmers/ranchers or owners/producers may have in place. During periods of heightened concern for infectious animal disease, additional procedures outlined in Levels 2 and 3 below may be implemented as recommended by APHIS and the State Veterinarian.

#### (1) Level I

Visits to farms/ranches that entail office or home visits only:

- (i) Avoid livestock area, pens, barns, etc., unless it is necessary to complete the goal of a visit.
- (ii) Park vehicles on paved or concrete areas, away from production sites on farms, to avoid contact with dirt/mud or manure.
- (iii) Wash hands with soap and water or an antibacterial gel before entering and after leaving the premises to avoid transmitting disease agents from person to person.

(2) Level 2

Visits to farms/ranches where minimal contact with livestock/poultry or their housing (barn/ pens, hutches, etc) is unavoidable to attain the goal of the visit:

- (i) Park vehicles on paved or concrete areas away from production sites on farms, to avoid contact with dirt, mud or manure.
- (ii) Put on clean rubber or new plastic boots upon exiting the vehicle.
- (iii) Wash hands with soap and water or an antibacterial gel before entering and after leaving the premises to avoid transmitting disease agents from person to person.
- (iv) After returning to vehicle, clean and disinfect any equipment used with a brush and approved EPA disinfectant solution (Virkon-S Oxonia Active/Oxycept 333).
- (v) Clean rubber boots with an approved EPA disinfectant diluted with water. Scrub the bottom of the boot with a brush to remove all dirt or debris. Dispose of disinfectant solution according to the label. Do not discard unused disinfectant on the ground.
- (vi) If wearing plastic boots, place them in a plastic bag and leave it on the premises for the owner/producer to dispose of them or place them in a designated "dirty" area of your vehicle.

(3) Level 3

Visits to farms/ranches where there will be close contact with livestock/poultry (walking through narrowly confined pens/lots where animals are within reach or actually handling/inspecting the animals):

- (i) Pre-plan the needed supplies and clothing for daily visits including, but not limited to, coveralls (cloth or Tyvex); boots (rubber or disposable plastic); latex exam; large water container; EPA approved disinfectant - Virkon-S Oxonia Active/Oxycept 333; long-handled brush; trash bags; paper towels; spray bottle w/water; liquid and/or gel antibacterial soap; and bucket/pail.
- (ii) Park vehicles on paved or concrete areas, away from production sites on farms, to avoid contact with dirt, mud or manure.
- (iii) Put on a pair of clean coveralls for each visit.
- (iv) Put on clean rubber or new plastic boots upon exiting the vehicle.
- (v) Designate a "clean" area in your vehicle to place clean equipment and boots.
- (vi) Designate a "dirty" area in your vehicle for clothing and equipment that has been used on the farm.
- (vii) Wash hands with soap and water or an antibacterial gel before entering and after leaving the premises to avoid transmitting disease agents from person to person.
- (viii) After returning to vehicle, clean and disinfect any equipment used with a brush and approved EPA disinfectant solution (Virkon-S Oxonia Active/Oxycept 333).
- (ix) Clean rubber boots with an approved EPA disinfectant diluted with water. Scrub the bottom of the boot with a brush to remove all dirt or debris. Dispose of disinfectant solution according to the label. Do not discard unused disinfectant on the ground.
- (x) If wearing plastic boots, place them in a plastic bag and leave it on the premises for the owner/producer to dispose of them or place them in a designated "dirty" area of your vehicle.
- (xi) Remove coveralls so that they are inside out and place them in a garbage bag.
- (xii) Place the clean equipment and boots in the designated "clean" area of the vehicle.
- (xiii) If the vehicle was not parked on a paved surface, wash vehicle tires and wheel wells to remove dirt and debris at a nearby pressure car wash.

(xiv) At the end of the day, dispose of all plastic bags that contain dirty supplies in a manner that prevents exposure to other livestock.

(xv) Launder all coveralls.

(xvi) Personal hygiene should include shampooing hair and cleaning under fingernails.

#### **403.85 Roles and Responsibilities**

(e) The Deputy Chief for Science and Technology is responsible for ensuring that biosecurity measures for infectious diseases are current.

(b) Regional Assistant Chiefs are responsible for ensuring that States and the Pacific Island Areas are familiar with the Agency policy on biosecurity measures.

(c) State Conservationists and the Director, Pacific Islands Areas are responsible for:

(1) Communicating the NRCS policy to all offices and to all State partners.

(2) Providing all NRCS offices with required equipment, materials, and information to implement Homeland Security and biosecurity measures and procedures.

(d) District Conservationists (or designated employees responsible for local management of NRCS resources) are responsible for:

(1) Ensuring that the local staff follows procedures as stated above to prevent the spread of harmful and highly contagious livestock and poultry diseases. Additional information regarding safety and health can be found in 1116 360, Personnel, Part 420, Safety & Health Management program.

(2) Ensuring that the local partners and staff are familiar with the above procedures.

(3) Providing status report to the appropriate line officer of activities and conditions in the area.

[GM.130.403.H Amendment 14 - March 2006]

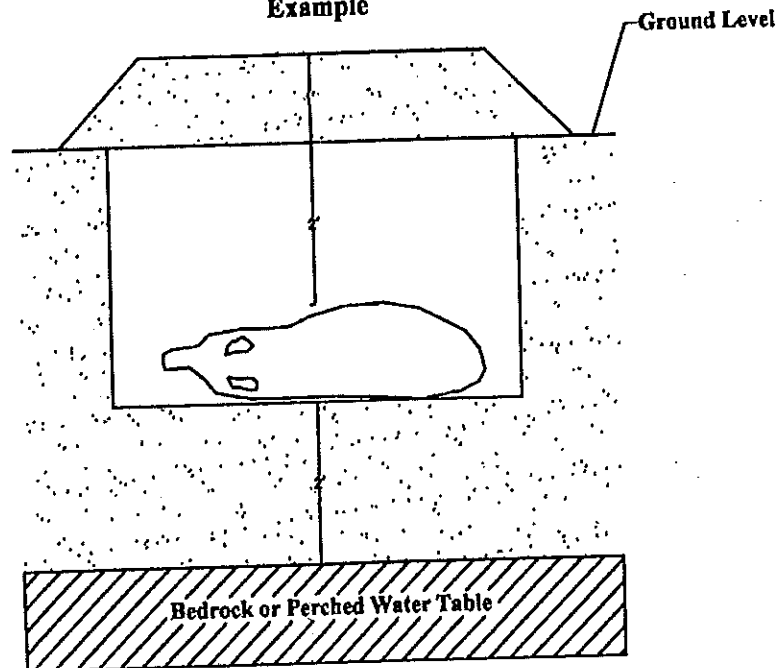


## GUIDELINES FOR LARGE DEAD ANIMAL DISPOSAL BY BURIAL

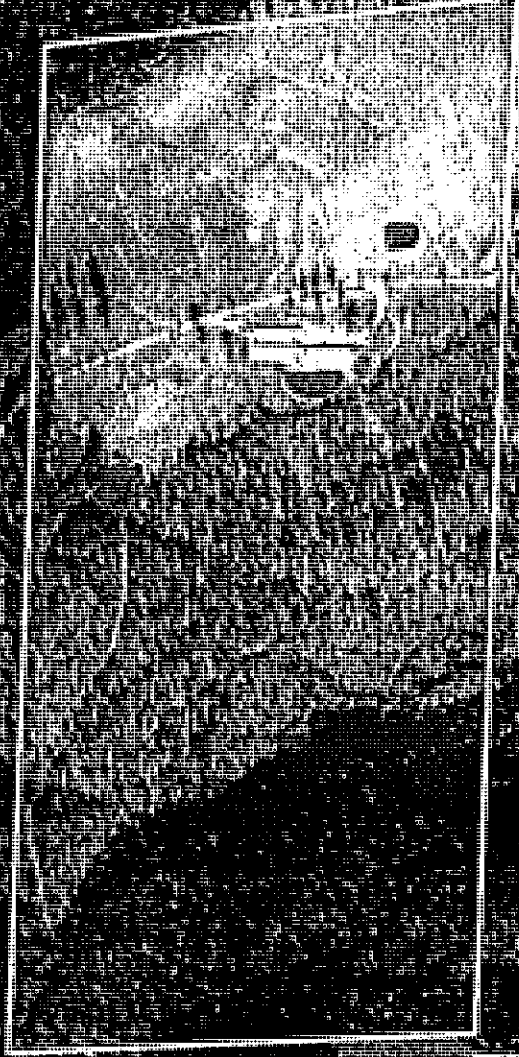
Dead animals shall be buried in pits or trenches, or by mounding. The burial should be performed in accordance with the following guidelines.

1. Burial shall be performed in the area denoted on the plan map as a recommended burial site. Burial areas shall be located a minimum of 300 feet down gradient from wells, springs and other water sources. Burial shall not be made within 300 feet of streams, ponds, or in soils identified in the USDA NRCS Soil Survey as being frequently flooded.
2. The bottom of the pit or trench should not be closer than 2 feet from a perched water table, or fractured or cavernous bedrock. A soil investigation of the burial site should be performed to insure that the soils are adequate for dead animal burial.
3. Pits or trenches shall be approximately 4 feet to a maximum of 6 feet deep. They should have stable slopes not steeper than 1 foot vertical to 1 foot horizontal. Vertical side slopes will be acceptable on pits dug to meet a one-time burial, provided that it is not necessary to have people working in the pit.
4. Dead animals shall be uniformly placed in the pit or trench so that the carcasses do not exceed a maximum thickness of 2 feet. All dead animals shall be covered the same day that they are placed in the pit or trench. The cover over and surrounding the buried animals shall be a minimum of 3 feet. The finished cover shall be shaped so drainage and runoff will be away from the pit or trench.
5. Burial areas shall be inspected regularly and any subsidence or cavities filled.

**Burial of Large Dead Animals**  
**Example**



# Mass Die Off Burial Map C & C Hog Barn



**Legend**

-  Burial site
-  Road
-  C & C Hog Barn
-  Field/Forest

## SECTION 3— ODOR AND PATHOGEN MANAGEMENT

It may not be practical or feasible to eliminate all odor emissions from the operation, but it is possible to manage or mitigate the odor. Some variables that effect odor are:

- Type of operation
- Ventilation method
- Building design
- Animal numbers
- Animal diets
- Manure treatment system
- Season
- Topography
- Management skill or effort

### 1. Animal Cleanliness

- a. Clean, dry and healthy animals are less odorous. Dirty, manure covered animals promote accelerated bacterial growth and the production of odorous gases.
- b. Animal stress can also be correlated to an increase in odor production. Ventilation and environmental controls for the buildings must be properly designed and maintained to keep the animals healthy.

### 2. Minimize Dust

- a. It has been established that there is a correlation between dust and odor emission. Dust particles absorb and concentrate odorous compounds. As the dust particles are carried by the wind, so is the odor.
- b. Therefore, minimizing dust will reduce odor. Most farm dust comes from feed and fecal matter. Dust also comes from animal skins, insects, etc.
- c. Buildings should be cleaned of all dust between batches of animals (including fans, shutters and screens).

### 3. Waste Storage Facility

This operation utilizes a holding pond waste management system. The system consists of a settling basin which overflows into a holding pond.

### 4. Proper Disposal of Mortality

Normal mortality for the animal feeding operation must be properly handled for both odor control and biological security of the operation. An incinerator will be utilized on this farm for normal mortality, with burial to be utilized in cases of mass mortality.

### 5. Good Fly and Rodent Control Programs

These programs must be a continuous process on the farm. When feed and waste products are properly handled, these problems are minimized.

### 6. Utilize Trees

While trees should not grow directly adjacent to facilities, wind breaks of trees correctly positioned near the facility not only create a visual barrier but can also provide a large filtration surface for dust and odorous compound removal. Trees can absorb odorous compounds and create turbulence that enhances odor dispersion and dilution. Trees can also create a cooler microclimate around the facility, which can reduce odors.

## **7. Land Application**

- a. avoid spreading when the wind will blow toward populated areas.
- b. avoid spreading just before weekends and holidays when people are more likely to be outdoors.
- c. avoid spreading near heavily traveled roadways.
- d. spread in the morning when the air is warming and rising rather than in the late afternoon.
- e. consider weather conditions - sunny, low humidity days reduce odors; turbulent breezes will dilute and dissipate odors.
- f. incorporating manure into the soil by injecting, plowing, disking, or chiseling helps reduce nutrient losses and odors.

### Pathogen Management

Many of the same conservation practices used to prevent nutrient movement from this animal feeding operation, such as runoff and erosion control, are likely to minimize the movement of pathogens.

Pathogenic organisms occur naturally in animal wastes. Exposure to some of these pathogens can cause illness to humans and animals, especially for immune-deficient

**EPA agreed to Chemical Handling Check List**

**No list available at this time, visited with Cargill Company Representatives and also landowners. The best and only policy that presently exists is to contact the integrator prior to applying any chemicals in or around the animal facility. Follow all label instructions regarding the use, handling, storage, and disposal of containers.**

**Chemicals in pastures and hay lands for weed and undesirable plants must also be applied and handled according to label recommendations. Contact the local county agent for recommended chemicals and herbicides. An applicators license is required for purchase and application of herbicides in Arkansas. Contact the county agent for applicators license. Caution again should be given to spraying pastures adjacent to swine facility, contact the integrator for advice.**

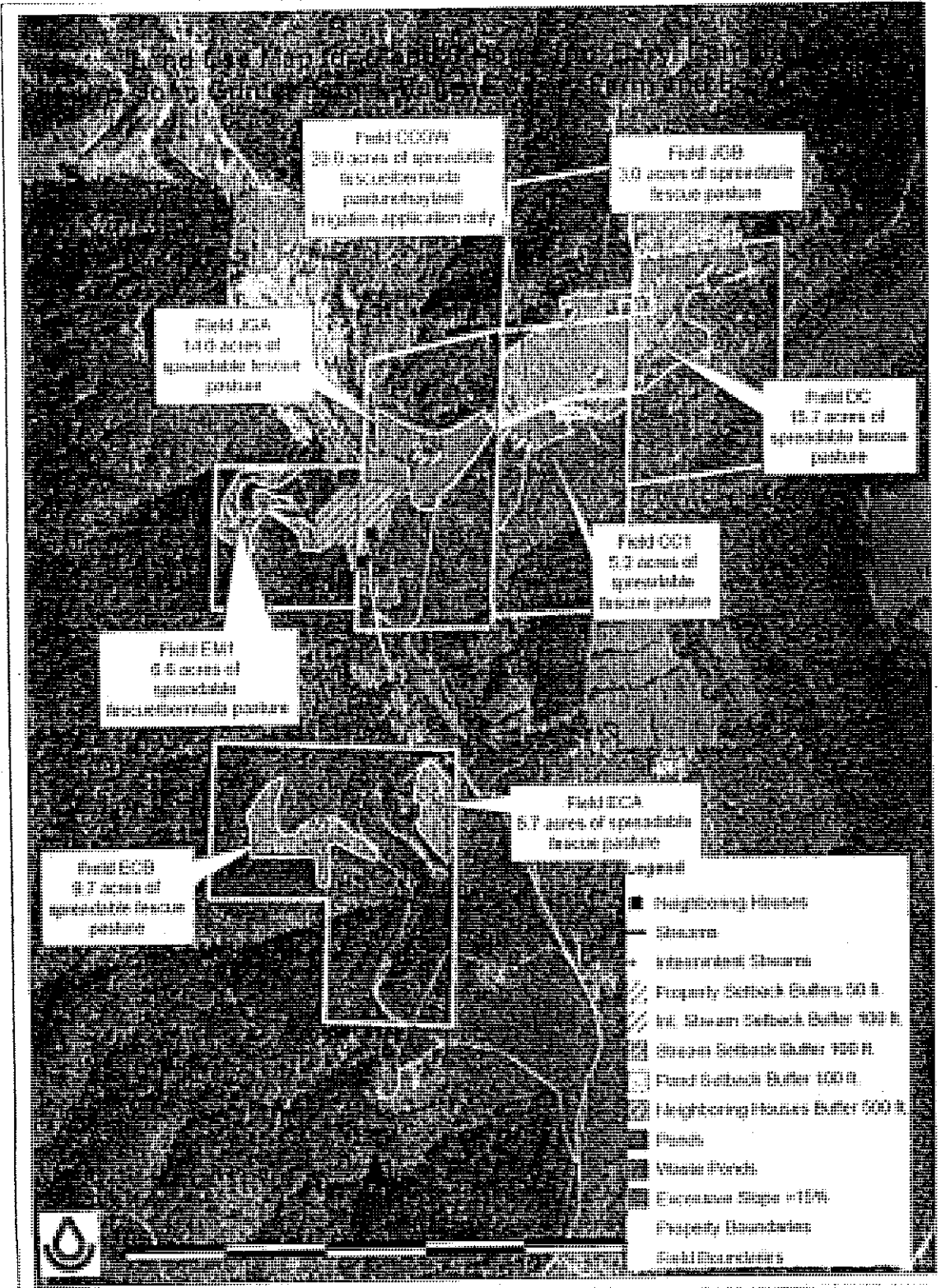
## Section 4 Land Treatment Conservation Practices

Aerial maps showing application area(s) waste utilization map(s)

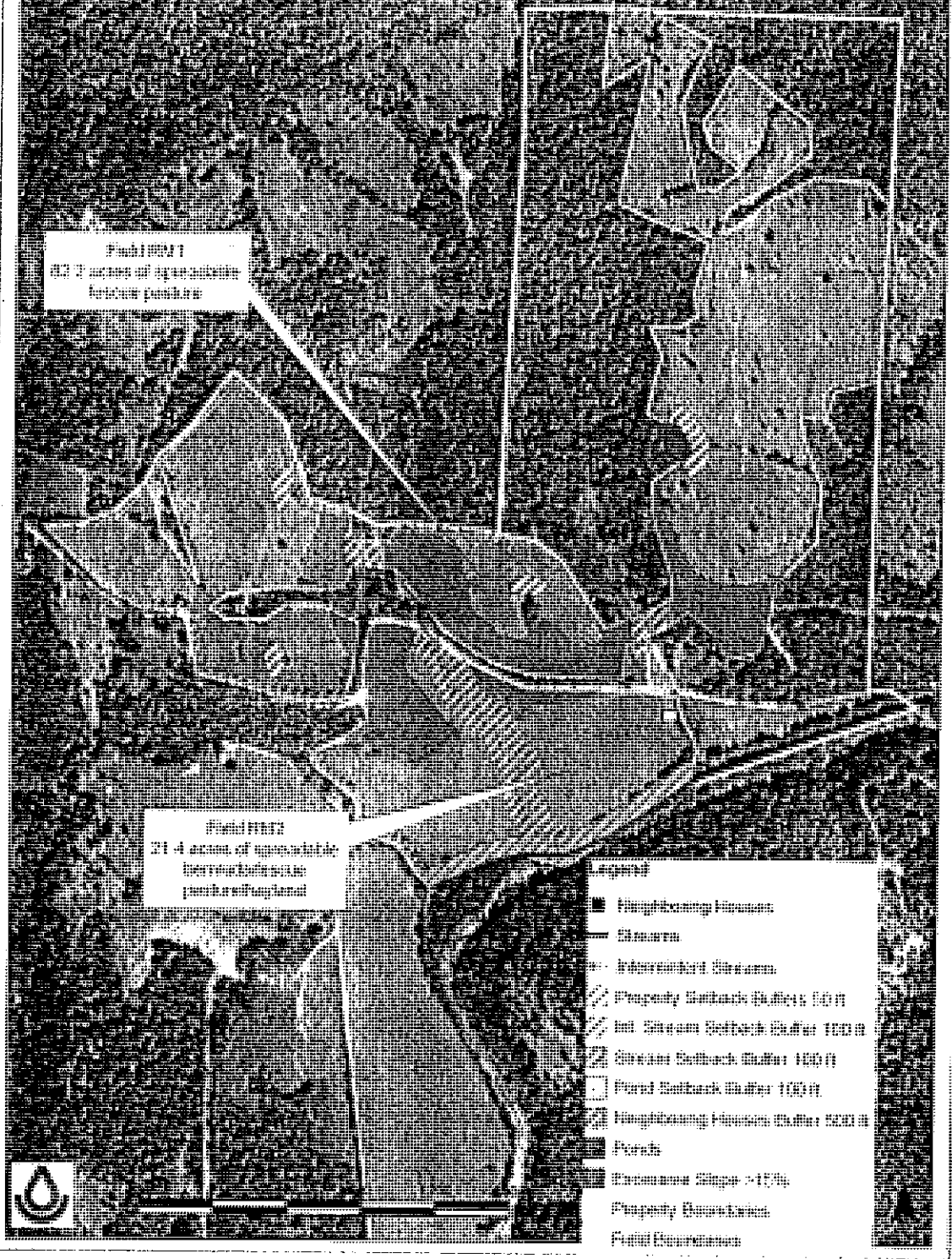
Waste utilization maps must show set-backs, buffers, ponds, streams, surrounding neighbors homes, sensitive areas, boundaries, labeled, field acreage minus buffer areas, and boundaries marked

Additional planned or applied conservation practices w/level of treatment they'll provide





Map of the Robert W. Jones Middle School



**Field #001**  
82.7 acres of agriculture  
Lactuca perfoliata

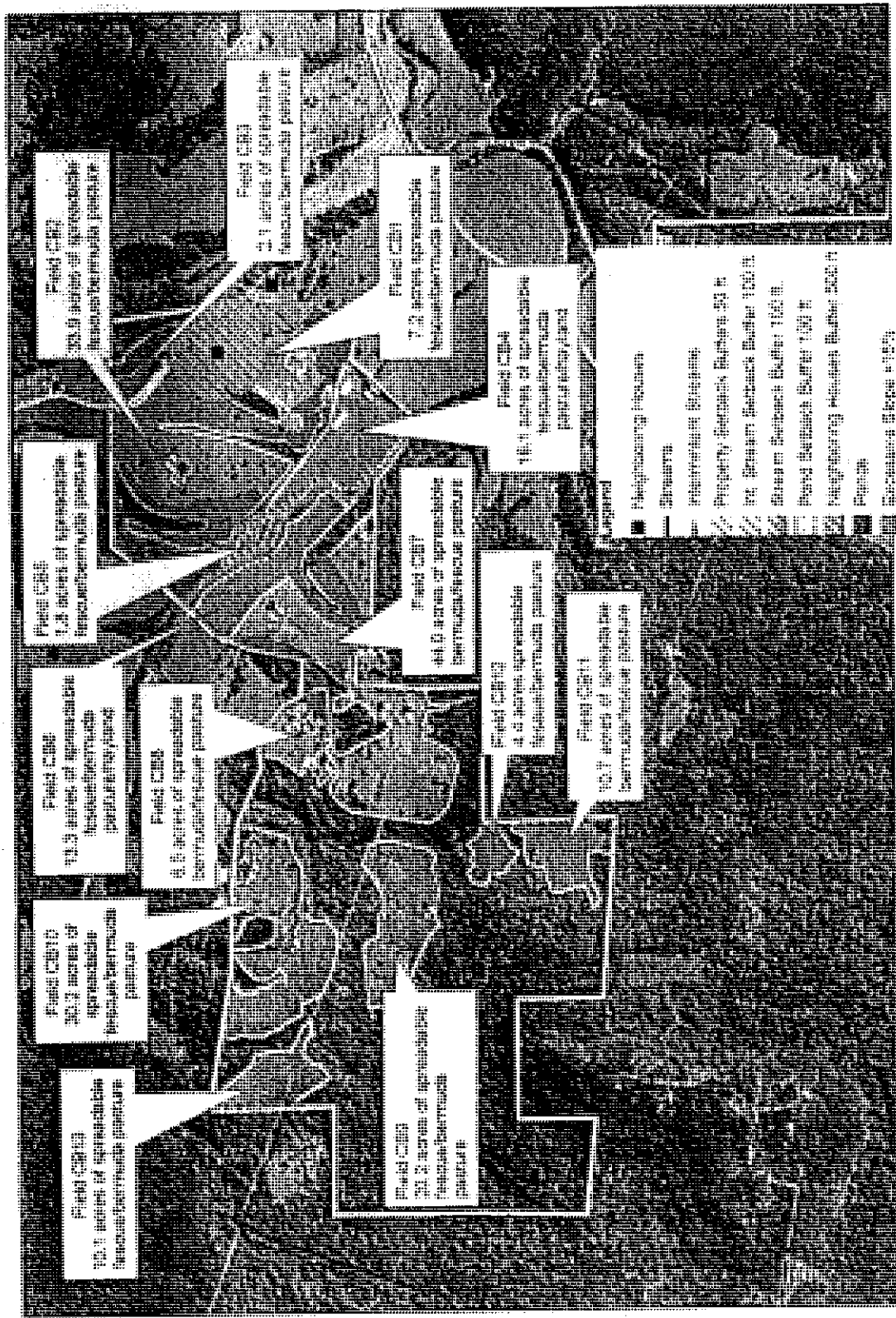
**Field #002**  
21.4 acres of upland  
Lactuca perfoliata  
Lactuca perfoliata

- Legend**
- Highway
  - Stream
  - Stream Buffer
  - Property Buffer (50 ft)
  - 1st Stream Buffer (50 ft)
  - Stream Buffer (100 ft)
  - Forest Buffer (100 ft)
  - Highway Buffer (500 ft)
  - Porch
  - Roof Slope >15%
  - Property Boundary
  - Field Boundary





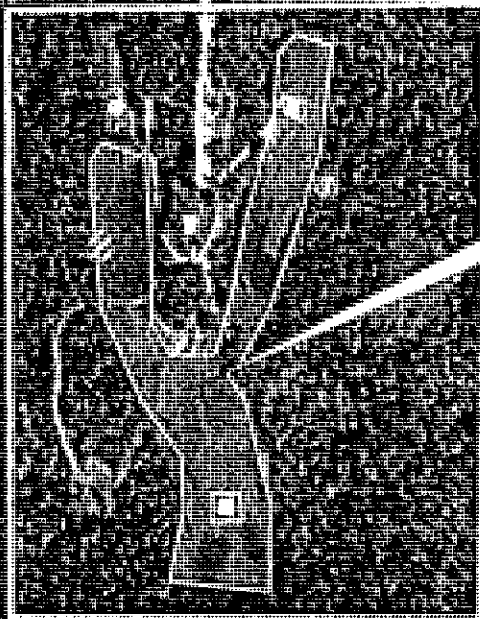
# Land Use Map for Charles Burdine Farm



1,000 0 1,000 2,000 3,000 4,000 Feet

Property Boundaries  
Field Boundaries

# Land Use Map for Waste Application



Point C03:  
ED 2 across of  
Spruce Lake Parkway  
Pavement

**Legend**

[Symbol]	Proposed Road
[Symbol]	Proposed Road Lane
[Symbol]	Proposed Road Lane
[Symbol]	Proposed Road Lane
[Symbol]	Proposed Road Lane

# Site Map for Pesticide Application

## Hari Bohannon's Farms



Field 1002  
18.7 acres of  
sprayable forest  
pasture



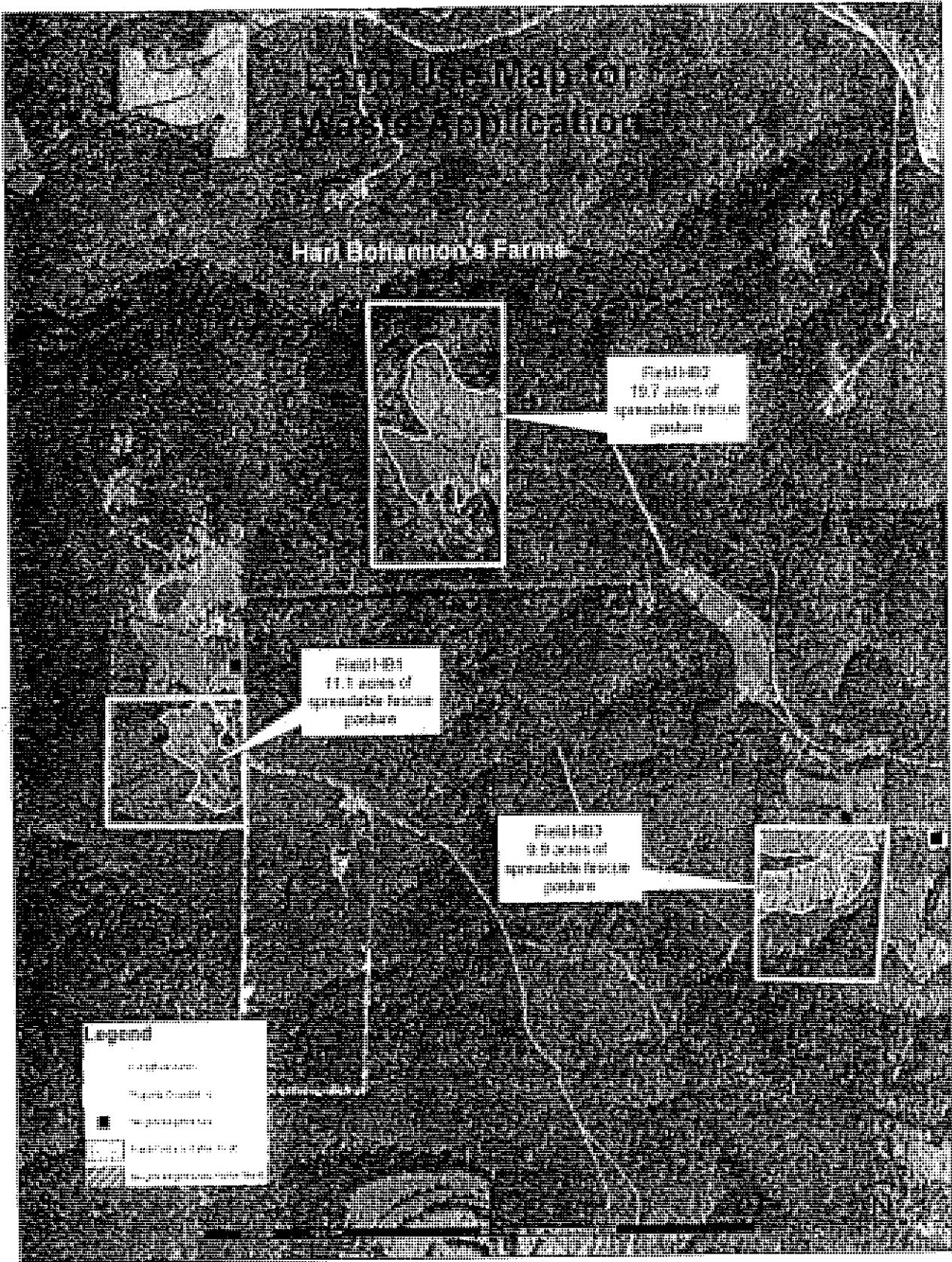
Field 1003  
11.8 acres of  
sprayable forest  
pasture

Field 1007  
12.8 acres of  
sprayable forest  
pasture



**Legend**

- sprayable area
- Field 1002
- Field 1003
- Field 1007
- Field 1008



Comments

Arkansas Nutrient Management Planner with 2009 PI (ver 03/2010)

Operator	Sherry Clark	Page	10/15/2010
Site Location	Wood Dale Hwy		

Nutrient Distribution Summary

Field	Programs	Soak	RTU	RTU	RTU	RTU	RTU	RTU	RTU	RTU	RTU	RTU
	(1/2) gal	(100 gal)										
CU1		207.95										
CU2		118.50										
CU3		24.85										
CU4		204.20										
CU5		129.43										
CU6		34.95										
CU7		571.85										
CU8		111.50										
CU9		157.00										
CU10		232.45										
CU11		28.51										
CU12		2401										
CU13		2401										

Supplemental Documentation of Inputs and Results for P Index and RUSLE Calculations

Field	CU1	CU2	CU3	CU4	CU5	CU6	CU7	CU8	CU9	CU10	CU11	CU12
Site Map Unit	11	12	14	15	16	17	18	19	20	21	22	23
Soil Type	Clay loam	Clay loam	Clay loam	Clay loam	Clay loam	Clay loam	Clay loam	Clay loam	Clay loam	Clay loam	Clay loam	Clay loam
Soil Phosphorus	150	150	150	150	150	150	150	150	150	150	150	150
Soil Nitrogen	50	50	50	50	50	50	50	50	50	50	50	50
Soil Sulfate	20	20	20	20	20	20	20	20	20	20	20	20
Soil Potassium	30	30	30	30	30	30	30	30	30	30	30	30
Soil Calcium	40	40	40	40	40	40	40	40	40	40	40	40
Soil Magnesium	10	10	10	10	10	10	10	10	10	10	10	10
Soil Zinc	5	5	5	5	5	5	5	5	5	5	5	5
Soil Manganese	2	2	2	2	2	2	2	2	2	2	2	2
Soil Boron	1	1	1	1	1	1	1	1	1	1	1	1
Soil Iron	10	10	10	10	10	10	10	10	10	10	10	10
Soil Sodium	1	1	1	1	1	1	1	1	1	1	1	1
Soil Phosphorus	10	10	10	10	10	10	10	10	10	10	10	10
Soil Nitrogen	5	5	5	5	5	5	5	5	5	5	5	5
Soil Sulfate	2	2	2	2	2	2	2	2	2	2	2	2
Soil Potassium	3	3	3	3	3	3	3	3	3	3	3	3
Soil Calcium	4	4	4	4	4	4	4	4	4	4	4	4
Soil Magnesium	1	1	1	1	1	1	1	1	1	1	1	1
Soil Zinc	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Soil Manganese	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Soil Boron	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Soil Iron	1	1	1	1	1	1	1	1	1	1	1	1
Soil Sodium	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Soil Phosphorus	10	10	10	10	10	10	10	10	10	10	10	10
Soil Nitrogen	5	5	5	5	5	5	5	5	5	5	5	5
Soil Sulfate	2	2	2	2	2	2	2	2	2	2	2	2
Soil Potassium	3	3	3	3	3	3	3	3	3	3	3	3
Soil Calcium	4	4	4	4	4	4	4	4	4	4	4	4
Soil Magnesium	1	1	1	1	1	1	1	1	1	1	1	1
Soil Zinc	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Soil Manganese	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Soil Boron	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Soil Iron	1	1	1	1	1	1	1	1	1	1	1	1
Soil Sodium	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

**Arkansas Nutrient Management Planner with 2004 PI (ver 3/3/2010)**

Project Name:	State/County:	Year:
W. D. D. D. D. D.	AR/CLAYTON	2010

**Field Management Practices**

Field	Location	Area	Soil	Planting	Conservation	Field ID	Row Spacing	Planting Method	Planting Date	Planting Depth	Planting Rate
CU1											
CU2											
CU3											
CU4											
CU5											
CU6											
CU7											
CU8											
CU9											
CU10											
CU11											
CU12											
CU13											
CU14											
CU15											
CU16											
CU17											
CU18											
CU19											
CU20											

**Field Nutrient Application Practices**

Per Acre Basis

Field	Soil	Area	Application			Nutrient Recommendations (lb)			Nutrients Applied (lb)			Surplus/Deficit (lb)				
			N	P	K	N	P	K	N	P	K	N	P	K		
CU1																
CU2																
CU3																
CU4																
CU5																
CU6																
CU7																
CU8																
CU9																
CU10																
CU11																
CU12																
CU13																
CU14																
CU15																
CU16																
CU17																
CU18																
CU19																
CU20																

**Per Field Basis**

Field	Soil	Area	Application			Nutrient Recommendations (lb)			Nutrients Applied (lb)			Surplus/Deficit (lb)				
			N	P	K	N	P	K	N	P	K	N	P	K		
CU1																
CU2																
CU3																
CU4																
CU5																
CU6																
CU7																
CU8																
CU9																
CU10																
CU11																
CU12																
CU13																
CU14																
CU15																
CU16																
CU17																
CU18																
CU19																
CU20																

**Arkansas Nutrient Management Plan for 2004 (rev 3/13/04)**

Project: **State Dept** Date: **10/2/2004**  
 Plan Developer: **Chris O'Hara**

The information presented in this report is intended for use by the applicant in order to provide a nutrient management plan for the proposed activity. The applicant is responsible for the implementation of the plan and for the accuracy of the information provided. The applicant is also responsible for the accuracy of the information provided to the applicant. The applicant is also responsible for the accuracy of the information provided to the applicant.

County Information	
County:	Washington
Township:	110
Section:	100

Nutrient Source and Disposition Information									
Source	Source Type	Annual Available	N Concentration	P2O5 Concentration	K2O Concentration	Water Excess (P)	Water Excess (N)	Water Excess (K)	Loss (%)
Manure	Local Manure	300	15000	1500	15000	0.70	0.70	0.70	10
Other	Local Manure	100	5000	500	5000	0.20	0.20	0.20	10

Nutrient Loss and Immobilization Factors					
Loss Source	Storage Losses (%)	App Losses (%)	Storage Losses (%)	App Losses (%)	App Losses (%)
Evaporation	0.00	0.00	0.00	0.00	0.00
Other	0.00	0.00	0.00	0.00	0.00

Estimated Field Available Nutrients									
Loss Source	Concentration	Loss (%)	Concentration	Loss (%)	Concentration	Loss (%)	Concentration	Loss (%)	Concentration
Manure	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
Other	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00

Field P Index Calculations													
Field	Soil Test P		Soil Test P	Slope Gradient (%)				Soil Length (ft)			Field P Index	Field P Index	
	Min	Max		Min	Max	Rec	Used	Min	Max	Used			
C01	10	20	15	0	10	10	10	10	10	10	10	10	10
C02	10	20	15	0	10	10	10	10	10	10	10	10	10
C03	10	20	15	0	10	10	10	10	10	10	10	10	10
C04	10	20	15	0	10	10	10	10	10	10	10	10	10
C05	10	20	15	0	10	10	10	10	10	10	10	10	10
C06	10	20	15	0	10	10	10	10	10	10	10	10	10
C07	10	20	15	0	10	10	10	10	10	10	10	10	10
C08	10	20	15	0	10	10	10	10	10	10	10	10	10
C09	10	20	15	0	10	10	10	10	10	10	10	10	10
C10	10	20	15	0	10	10	10	10	10	10	10	10	10

Field	Field Area (ac)	Field Area (ha)	Field Area (ha)	Field Area (ha)	Field Area (ha)	Field Area (ha)	Field Area (ha)	Field Area (ha)	Field Area (ha)	Field Area (ha)	Field Area (ha)	Field Area (ha)
C01	10.00	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05
C02	10.00	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05
C03	10.00	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05
C04	10.00	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05
C05	10.00	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05
C06	10.00	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05
C07	10.00	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05
C08	10.00	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05
C09	10.00	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05
C10	10.00	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05

Field	Field Area	Field Area	Field Area	Field Area	Field Area	Field Area	Field Area	Field Area	Field Area	Field Area	Field Area	Field Area
C01	10.00	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05
C02	10.00	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05
C03	10.00	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05
C04	10.00	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05
C05	10.00	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05
C06	10.00	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05
C07	10.00	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05
C08	10.00	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05
C09	10.00	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05
C10	10.00	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05

**Arkansas Nutrient Management Planner with 1000 Pi (rev 5/2/2016)**

**Name:** Booby Park  
**Date Developed:** 12/20/16  
**Project Number:** 122      **Sheet:** 01/2000

**Manure On-Farm Application**  
**Units Applied by Field and Source**

Field	Irrigation (1000 gal.)	Stock (1000 gal.)	Swine
222A			
222B			
222C			
222D			
222E			
222F			
222G			
222H			
222I			
222J			
222K			
222L			
222M			
222N			
222O			
222P			
222Q			
222R			

**Supplemental Documentation of Inputs and Results for P Index and NREB Calculations**

Field	222A	222B	222C	222D	222E	222F	222G	222H	222I	222J	222K	222L	222M	222N	222O	222P	222Q	222R
Soil Type	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Soil Water	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Soil Phosphorus	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Soil Nitrogen	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Soil Organic Carbon	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Soil Bulk Density	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Soil Water Capacity	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Soil Phosphorus Saturation	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Soil Nitrogen Saturation	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Soil Organic Carbon Saturation	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Soil Bulk Density (kg/m³)	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
Soil Water Capacity (mm)	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Soil Phosphorus Saturation (%)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Soil Nitrogen Saturation (%)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Soil Organic Carbon Saturation (%)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Soil Bulk Density (lb/ft³)	93.75	93.75	93.75	93.75	93.75	93.75	93.75	93.75	93.75	93.75	93.75	93.75	93.75	93.75	93.75	93.75	93.75	93.75
Soil Water Capacity (in)	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39
Soil Phosphorus Saturation (%)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Soil Nitrogen Saturation (%)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Soil Organic Carbon Saturation (%)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Comments

Arkansas Nutrient Management Planner with 2004 PI (ver 1/1/1616)

Operator: Stacy Cook Date: 04/10/16  
 Farm/Property: 1000010000

**Field Management Practices**

Field	Operation	Target	Actual	Enter Soil P	Drilled Waterway	Forcing	Replant Soil P Buffer	Replant Nutrient Buffer	Field Drains	Field BMP P Value	Field Page
CCW										66	Under
CC										66	Under
CC-A										66	Under
CC-B										66	Under
CC-C										66	Under
CC-D										66	Under
CC-E										66	Under
CC-F										66	Under
CC-G										66	Under
CC-H										66	Under
CC-I										66	Under
CC-J										66	Under
CC-K										66	Under
CC-L										66	Under

**Field Management Practices Per Acre Basis**

Field	Soil Type	Application		Nitrogen Applied (lb/acre)			Phosphorus Applied (lb/acre)			Sulfur Applied (lb/acre)		
		Rate	Amount	N	P2O5	S	P	PK2	S	P	S	
CCW	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	0
CC	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	
CC-A	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	
CC-B	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	
CC-C	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	
CC-D	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	
CC-E	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	
CC-F	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	
CC-G	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	
CC-H	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	
CC-I	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	
CC-J	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	
CC-K	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	
CC-L	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	

**Per Field Basis**

Field	Soil Type	Application		Nitrogen Applied (lb/acre)			Phosphorus Applied (lb/acre)			Sulfur Applied (lb/acre)		
		Rate	Amount	N	P2O5	S	P	PK2	S	P	S	
CCW	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	0
CC	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	0
CC-A	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	0
CC-B	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	0
CC-C	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	0
CC-D	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	0
CC-E	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	0
CC-F	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	0
CC-G	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	0
CC-H	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	0
CC-I	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	0
CC-J	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	0
CC-K	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	0
CC-L	Argosols	30.00	1000 gal	100	0	0	50	0	0	0	0	0
TOTAL				1000	0	0	500	0	0	0	0	0



**Arkansas Nutrient Management Planner with 2000 PI (ver 3/3/2016)**

Project Name: **2000 PI** Date: **10/15/2015**

Project Location: **2000 PI**

This program is a computerized version of the Nutrient Management Planner for the application of manure by pasture and hayland. To utilize the program, you must enter the information for the farm, estimate the manure received by the defined conditions of land use, estimate the amount of manure to be applied to the various receiving fields, and estimate the amount of manure available for application. The program is the result of an effort to develop a reference planning tool for use by the state as a way to help farmers and ranchers make decisions on manure application for improved water quality and increased productivity.

**County Information**

County Name	Madison
County Code	115
County Population	100

**Nutrient Source and Distribution Information**

Nutrient Source	Source Type	Annual Manure (lb)	N Concentration (lb/1000 gal)	P Concentration (lb/1000 gal)	K Concentration (lb/1000 gal)	N Concentration (lb/1000 gal)	P Concentration (lb/1000 gal)	K Concentration (lb/1000 gal)	Water (lb/1000 gal)	Water (lb/1000 gal)	Water (lb/1000 gal)
Manure	Manure	141	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Slurry	Slurry	141	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Nutrient Loss and Absorption Factors**

Loss Type	Loss (%)	Loss (%)	Loss (%)	Loss (%)	Loss (%)	Loss (%)	Loss (%)
Ammonia	30	30	30	30	30	30	30
Denitrification	30	30	30	30	30	30	30
Volatilization	30	30	30	30	30	30	30

**Estimated Field Available Nutrients**

Field and Source	Concentration (lb/1000 gal)	Year (lb)	Concentration (lb/1000 gal)	Total (lb)	Concentration (lb/1000 gal)	Year (lb)	Concentration (lb/1000 gal)	Total (lb)
Manure	1.00	141	1.00	141	1.00	141	1.00	141
Slurry	1.00	141	1.00	141	1.00	141	1.00	141

**Field Product Categories**

Field	Soil Type	Soil Class	Soil Class	Soil Class	Soil Class	Soil Class	Soil Class	Soil Class	Soil Class	Soil Class	Soil Class	Soil Class	Soil Class	Soil Class	Soil Class	Soil Class	Soil Class	Soil Class
Field 1	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

**Field Product Categories (continued)**

Field	Field Name	Field Type	Field Type	Field Type	Field Type	Field Type	Field Type	Field Type	Field Type	Field Type	Field Type	Field Type	Field Type	Field Type	Field Type	Field Type	Field Type	Field Type
Field 1	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

**Field Product Categories (continued)**

Field	Field Name	Field Type	Field Type	Field Type	Field Type	Field Type	Field Type	Field Type	Field Type	Field Type	Field Type	Field Type	Field Type	Field Type	Field Type	Field Type	Field Type	Field Type
Field 1	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

AGRICULTURAL DIAGNOSTIC LABORATORY  
UNIVERSITY OF ARKANSAS- FAYETTEVILLE  
LIQUID MANURE FOR FERTILIZER ANALYSIS (report for AGRI-429)

Name:	C & C FARMS	Received in lab:	6/04/2010
Address:	P.O. BOX 45	Mailed:	7/07/2010
City:	VENDER	State, Zip:	AR 72683
County:	NEWTON	Check #:	0217 partial payment

Lab. No.	M100841	M100842			
Sample I.D.	1	2			
ID, continued	swine	swine			
	none given	none given			
Bedding type	none	none			
Manure type	pond liquid	pond sludge			
Sample date	6/02/2010	6/02/2010			
Age of manure	none given	none given			
pH	6.0	7.2			
EC(umhos/cm)	8250	8180			
% Solids	0.39	3.02			

		-mg/l on as-is basis-			
Total N	784	1720			
Total P	102	801			
Total K	887	1181			
Total Ca	38	980			
NH4-N	782	887			
NO3-N					
Water Extractable P	81	239			

		-lbs/1000 gal on as-is basis-			
Total N	6.6	14.3			
TOTAL P AS "P2O5"	1.0	16.3			
TOTAL K AS "K2O"	8.8	11.8			
Total Ca	0.3	6.2			
NH4-N	6.3	8.2			
NO3-N					
Water Extractable P	0.7	2.0			

\*lbs/1000gal P2O5 = mg/l Total P on "as-is" basis multiplied by 2.29\*0.00833  
 \*lbs/1000gal K2O = mg/l Total K on "as-is" basis multiplied by 1.2\*0.00833  
 \*Water Extractable P: 1:100 solids to H2O ratio, 1 hr shake, centrifuged, acidified, analysis by ICP

**SECTION 5 – NUTRIENT MANAGEMENT**  
 Nutrients (Manure, Wastewater, and Commercial Fertilizers)

Used two waste analysis dated 07/07/2010 that Richard Campbell has took from his holding pond.  
 See attached sample report:

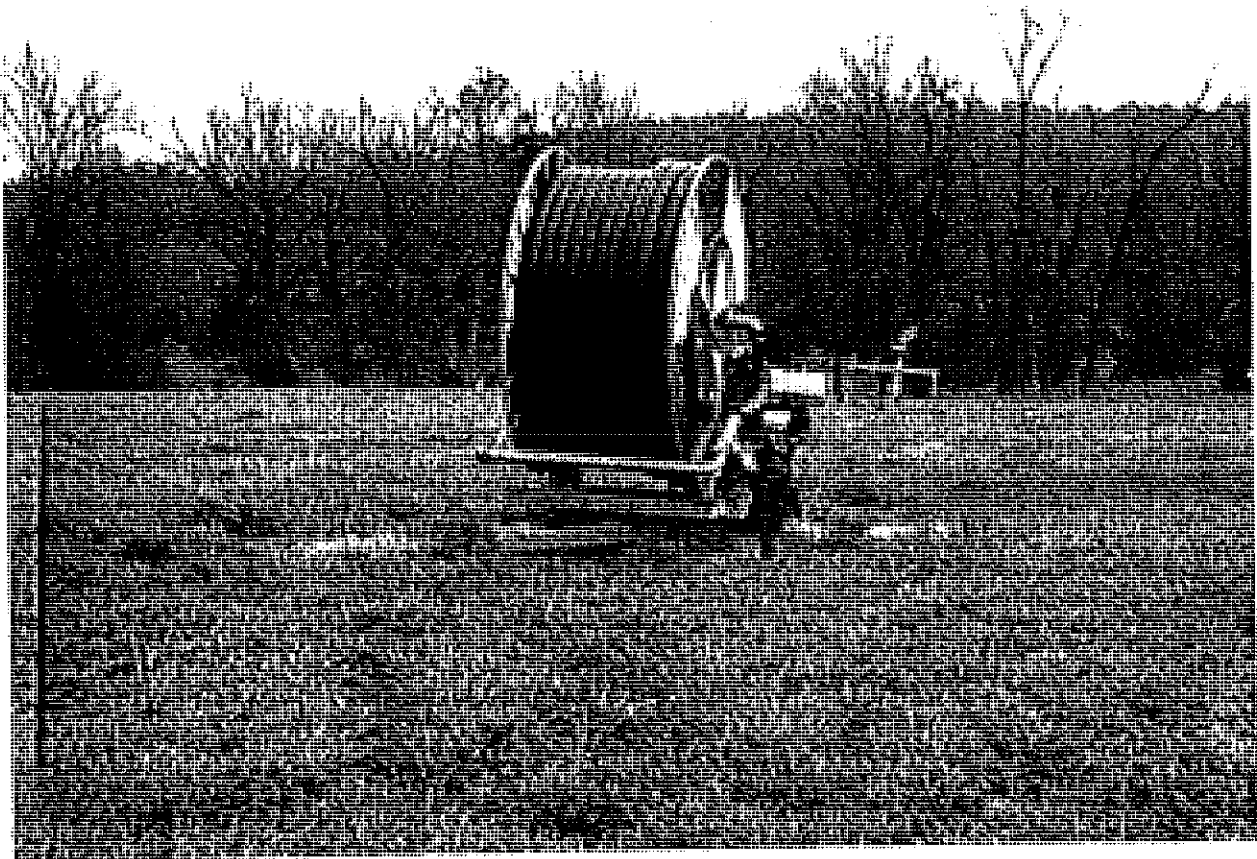
Updates to this CNMP shall be based on manure sampling and analysis from the waste storage structures.

Below is a chart that the U. of A. has compiled showing analysis test results:  
**January – April 2008 Liquid Swine Manure Analysis**  
**University of Arkansas Laboratory**  
 Provided by: University of Arkansas Cooperative Extension Service

	<b>N</b> (lb/1,000 gal)	<b>P</b> (lb/1,000 gal)	<b>P<sub>2</sub>O<sub>5</sub></b> (lb/1,000 gal)	<b>K</b> (lb/1,000 gal)	<b>K<sub>2</sub>O</b> (lb/1,000 gal)	<b>WEP</b> (lb/1,000 gal)	<b>WE/P</b>
<b>Count</b>	28	38	38	28	28	38	38
<b>Min</b>	0.99	0.53	1.22	0.48	0.58	0.40	0.16
<b>Max</b>	45.82	18.63	42.67	18.03	21.81	5.28	0.98
<b>Average</b>	17.45	6.23	14.27	6.57	7.95	2.13	0.48
<b>Median</b>	18.05	4.50	10.30	5.62	6.80	1.97	0.40
<b>Design</b>	17	6	14	7	8	2	0

## Section 5 SOIL EROSION AND PHOSPHORUS RISK

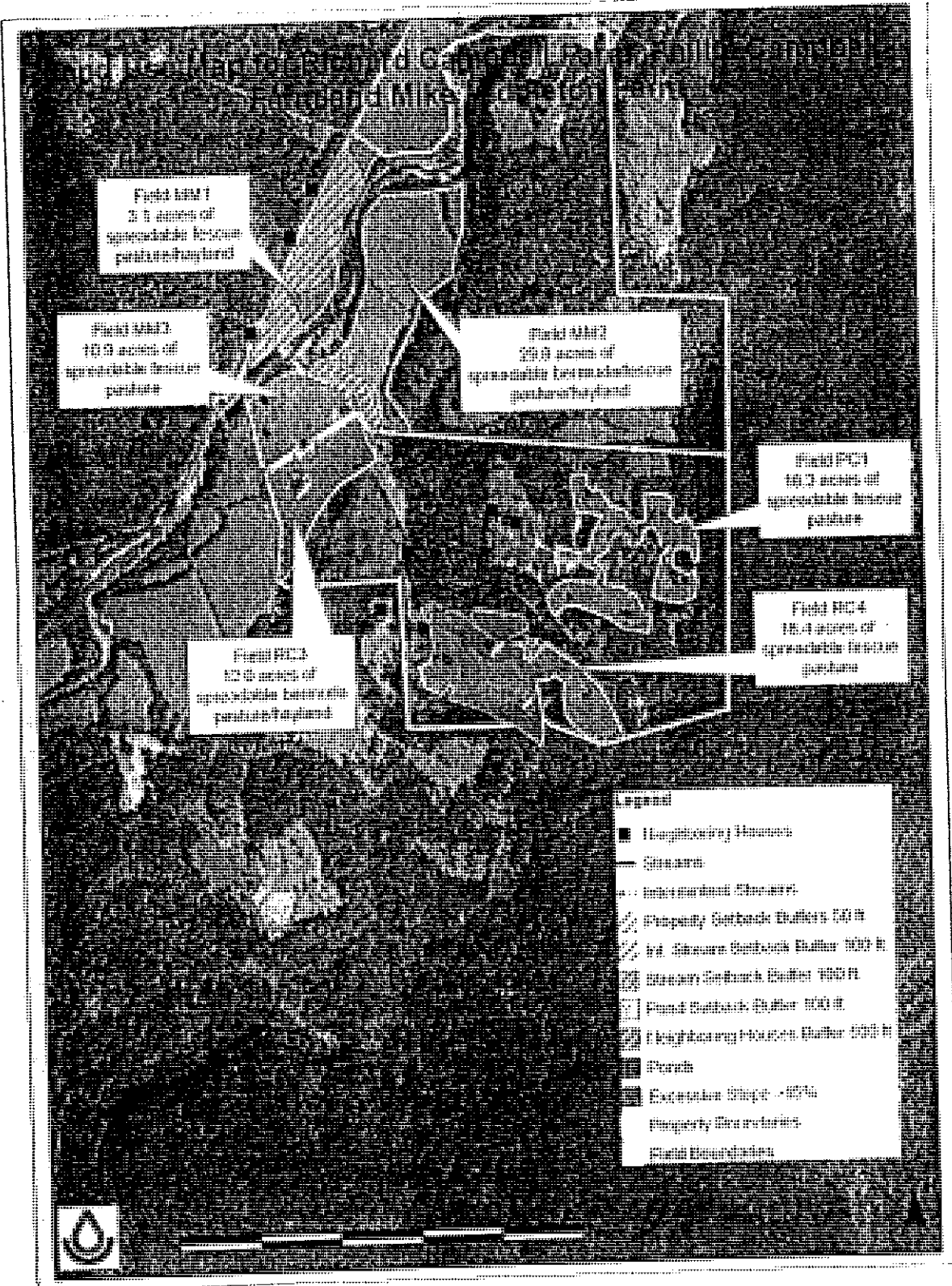
Soil Information soil maps and interpretations  
Waste analysis  
Predicted soils loss (figured in the P-Index program)  
Phosphorus index computations



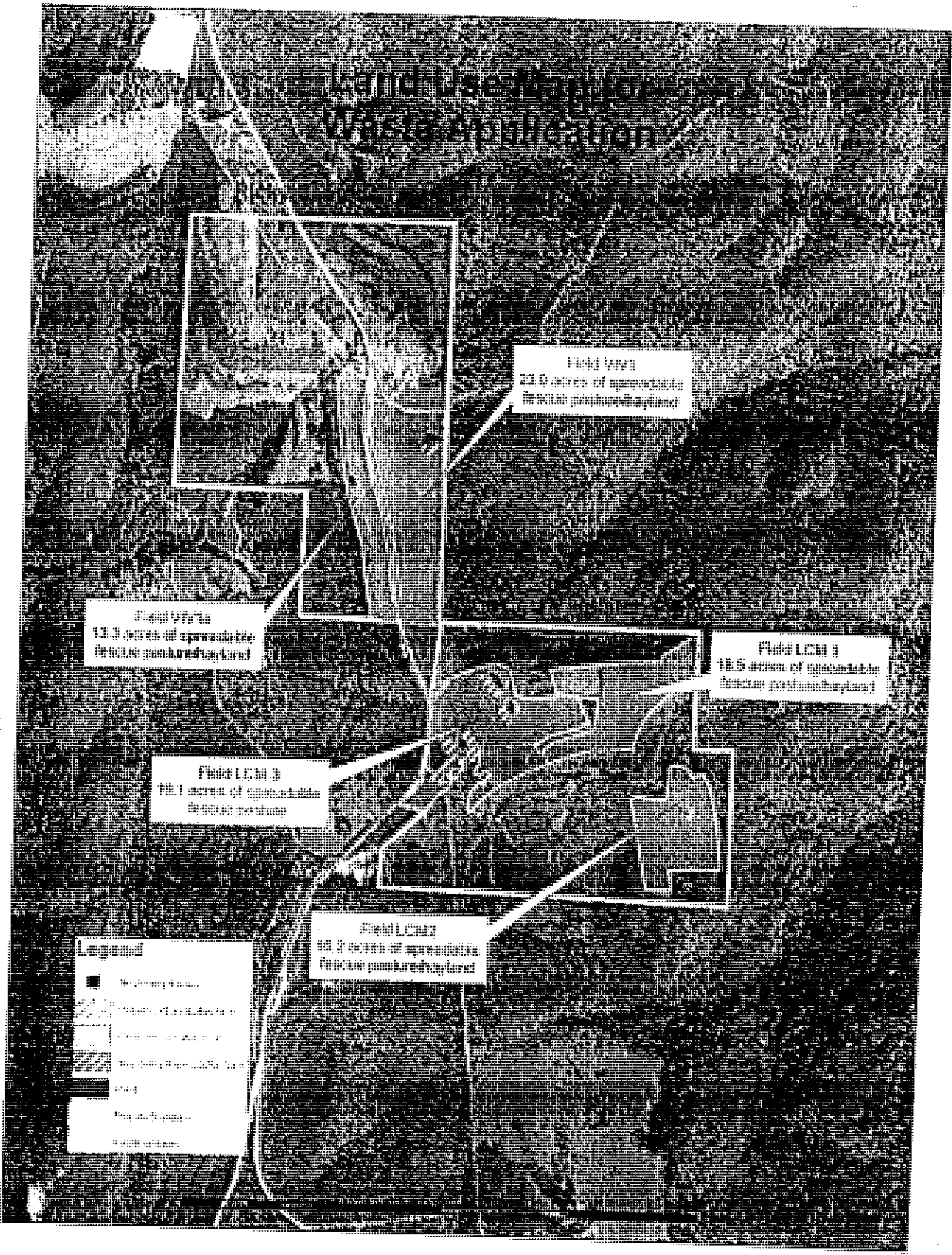
## SECTION 4 – LAND TREATMENT PRACTICES

Sites Proposed for Land Application – See Maps in Section 4 and 2

Any land treatment practices on application lands should be listed in this section. Contact your District Conservationists for applicable practices.



# Land Use Map of Watershed



**Arkansas Nutrient Management Planner with 2009 PI (ver 3/3/2010)**

**Project:** Shady Fork  
**PI Description:** Grand Old Bay

This spreadsheet is intended to assist in the development of a Nutrient Management Plan for the application of fertilizer and pesticides to agricultural land. To do this, the user must estimate the crop yield for the farm, determine the fertilizer rate by the nutrient analysis of each crop, select a fertilizer product, and determine the fertilizer application rate. The user must also estimate the amount of the fertilizer that will be lost to the environment. The user must also estimate the amount of fertilizer that will be applied to the land. The user must also estimate the amount of fertilizer that will be applied to the land. The user must also estimate the amount of fertilizer that will be applied to the land.

County Information	County
County	Madison
County	Madison
County	Madison

Nutrient Source and Detection Information										
Source	Source Type	Amount Available	N Concentration	P Concentration	K Concentration	Water Available	N Concentration	P Concentration	K Concentration	Water Available
Hydropon	Liquid Fertilizer	100	14.30	14.30	14.30	100	14.30	14.30	14.30	100
Rock	Liquid Fertilizer	100	14.30	14.30	14.30	100	14.30	14.30	14.30	100

Nutrient Loss and Flow/Washoff Factors						
Nutrient Source	N Loss		P Loss		K Loss	
	Storage Losses (%)	Appl Losses (%)	Storage Losses (%)	Appl Losses (%)	Storage Losses (%)	Appl Losses (%)
Hydropon	50%	25%	10%	10%	10%	10%
Rock						

Nutrient Flow Available Nutrients										
Nutrient Source	N		P		K		N		P	
	Concentration	Flow	Concentration	Flow	Concentration	Flow	Concentration	Flow	Concentration	Flow
Hydropon	14.30	14300 lbs	14.30	14300 lbs	14.30	14300 lbs	14.30	14300 lbs	14.30	14300 lbs
Rock	14.30	14300 lbs	14.30	14300 lbs	14.30	14300 lbs	14.30	14300 lbs	14.30	14300 lbs

Field Fertilizer Calculations												
Field	Soil Test			Soil Data (1/5)			Soil Data (1/5)			Fertilizer		
	ppm	ppm	ppm	Var	Var	Var	Used	Var	Var	Var	Used	Fertilizer
1A	15	15	15	1	1	1	1	1	1	1	1	1
1B	17	17	17	1	1	1	1	1	1	1	1	1
1C	19	19	19	1	1	1	1	1	1	1	1	1
1D	21	21	21	1	1	1	1	1	1	1	1	1
1E	23	23	23	1	1	1	1	1	1	1	1	1
1F	25	25	25	1	1	1	1	1	1	1	1	1
1G	27	27	27	1	1	1	1	1	1	1	1	1
1H	29	29	29	1	1	1	1	1	1	1	1	1
1I	31	31	31	1	1	1	1	1	1	1	1	1
1J	33	33	33	1	1	1	1	1	1	1	1	1
1K	35	35	35	1	1	1	1	1	1	1	1	1
1L	37	37	37	1	1	1	1	1	1	1	1	1
1M	39	39	39	1	1	1	1	1	1	1	1	1
1N	41	41	41	1	1	1	1	1	1	1	1	1
1O	43	43	43	1	1	1	1	1	1	1	1	1
1P	45	45	45	1	1	1	1	1	1	1	1	1

Field	Field Area (A)	D. Per (ppm)	D. Per (ppm)	App Area (A)	Theoretical Vegetation	Percent Ground Cover	Conversion Factors		D. Per (ppm)	D. Per (ppm)
							Conversion Factor	Conversion Factor		
1A	14.30			14.30	Grass	95.00	None in place	0.25	1.25	
1B	17.00			17.00	Grass	95.00	None in place	0.25	1.25	
1C	19.00			19.00	Grass	95.00	None in place	0.25	1.25	
1D	21.00			21.00	Grass	95.00	None in place	0.25	1.25	
1E	23.00			23.00	Grass	95.00	None in place	0.25	1.25	
1F	25.00			25.00	Grass	95.00	None in place	0.25	1.25	
1G	27.00			27.00	Grass	95.00	None in place	0.25	1.25	
1H	29.00			29.00	Grass	95.00	None in place	0.25	1.25	
1I	31.00			31.00	Grass	95.00	None in place	0.25	1.25	
1J	33.00			33.00	Grass	95.00	None in place	0.25	1.25	
1K	35.00			35.00	Grass	95.00	None in place	0.25	1.25	
1L	37.00			37.00	Grass	95.00	None in place	0.25	1.25	
1M	39.00			39.00	Grass	95.00	None in place	0.25	1.25	
1N	41.00			41.00	Grass	95.00	None in place	0.25	1.25	
1O	43.00			43.00	Grass	95.00	None in place	0.25	1.25	
1P	45.00			45.00	Grass	95.00	None in place	0.25	1.25	

Field	Fertilizer	Application Method	Application Time	Fertilizer Source	Application Rate	Rate (ppm)	Rate (ppm)	Rate (ppm)	Rate (ppm)	Target Value
1A	Rock	Surface Applied	Nov Feb	Rock	11.00	1000 ppm	50	High	50	50
1B	Rock	Surface Applied	Nov Feb	Rock	11.00	1000 ppm	50	High	50	50
1C	Rock	Surface Applied	Nov Feb	Rock	11.00	1000 ppm	50	High	50	50
1D	Rock	Surface Applied	Nov Feb	Rock	11.00	1000 ppm	50	High	50	50
1E	Rock	Surface Applied	Nov Feb	Rock	11.00	1000 ppm	50	High	50	50
1F	Rock	Surface Applied	Nov Feb	Rock	11.00	1000 ppm	50	High	50	50
1G	Rock	Surface Applied	Nov Feb	Rock	11.00	1000 ppm	50	High	50	50
1H	Rock	Surface Applied	Nov Feb	Rock	11.00	1000 ppm	50	High	50	50
1I	Rock	Surface Applied	Nov Feb	Rock	11.00	1000 ppm	50	High	50	50
1J	Rock	Surface Applied	Nov Feb	Rock	11.00	1000 ppm	50	High	50	50
1K	Rock	Surface Applied	Nov Feb	Rock	11.00	1000 ppm	50	High	50	50
1L	Rock	Surface Applied	Nov Feb	Rock	11.00	1000 ppm	50	High	50	50
1M	Rock	Surface Applied	Nov Feb	Rock	11.00	1000 ppm	50	High	50	50
1N	Rock	Surface Applied	Nov Feb	Rock	11.00	1000 ppm	50	High	50	50
1O	Rock	Surface Applied	Nov Feb	Rock	11.00	1000 ppm	50	High	50	50
1P	Rock	Surface Applied	Nov Feb	Rock	11.00	1000 ppm	50	High	50	50



**Arkansas Nutrient Management Planner with NRI PI (ver 3/2/18)**

Operator: **Boyd Clark** Date: **10/12/2018**  
 Field Operator: **D and D Hwy Bus**

Field	Location	Area	Field	Operator	Grassed	Forage	Repair	Reopen	Field	Total	Index
					Waterway		Work	Work	Order	Value	Page
201		28	20%							57	Medium
202		28	20%							57	Medium
203		28	20%							57	Medium
204		28	20%							57	Medium
205		28	20%							57	Medium
206		28	20%							57	Medium
207		28	20%							57	Medium
208		28	20%							57	Medium
209		28	20%							57	Medium
210		28	20%							57	Medium

**Field Nutrient Application Planning**

Per Acre Rates

Field	Nutrient Source	Application		NRI PI (lb/acre)			NRI PI (lb/acre)			Surplus (lb/acre)	
		Rate	Method	N	P2O5	K2O	N	P2O5	K2O	N	P2O5
201	Soak	11.00	11.00	100 gal	100	0	0	0	0	0	0
202	Soak	11.00	11.00	100 gal	100	0	0	0	0	0	
203	Soak	11.00	11.00	100 gal	100	0	0	0	0	0	
204	Soak	11.00	11.00	100 gal	100	0	0	0	0	0	
205	Soak	11.00	11.00	100 gal	100	0	0	0	0	0	
206	Soak	11.00	11.00	100 gal	100	0	0	0	0	0	
207	Soak	11.00	11.00	100 gal	100	0	0	0	0	0	
208	Soak	11.00	11.00	100 gal	100	0	0	0	0	0	
209	Soak	11.00	11.00	100 gal	100	0	0	0	0	0	
210	Soak	11.00	11.00	100 gal	100	0	0	0	0	0	

**Per Field Rates**

Field	Nutrient Source	Application		NRI PI (lb/acre)			NRI PI (lb/acre)			Surplus (lb/acre)	
		Rate	Method	N	P2O5	K2O	N	P2O5	K2O	N	P2O5
201	Soak	28.00	28.00	100 gal	280	0	0	0	0	0	
202	Soak	28.00	28.00	100 gal	280	0	0	0	0	0	
203	Soak	28.00	28.00	100 gal	280	0	0	0	0	0	
204	Soak	28.00	28.00	100 gal	280	0	0	0	0	0	
205	Soak	28.00	28.00	100 gal	280	0	0	0	0	0	
206	Soak	28.00	28.00	100 gal	280	0	0	0	0	0	
207	Soak	28.00	28.00	100 gal	280	0	0	0	0	0	
208	Soak	28.00	28.00	100 gal	280	0	0	0	0	0	
209	Soak	28.00	28.00	100 gal	280	0	0	0	0	0	
210	Soak	28.00	28.00	100 gal	280	0	0	0	0	0	
Total					2800	0	0	0	0	0	0



**Arkansas Nutrient Management Planner with 2008 PI (ver 03/2010)**

Project: **Stacy Oaks**  
 Date: **10/2/2010**

The user shall be responsible for the entry of the management plans for the application of nutrients to pasture and hay land. To obtain the most accurate estimates the user should refer to the user manual for the correct conversion of each field. Values within the planner are for general use only. The user should refer to the user manual for more information on the correct use of the planner. The user should refer to the user manual for more information on the correct use of the planner.

**County Information**

County	Madison
Latitude	36.0000
Longitude	-91.0000
State	AR

**Nutrient Source and Distribution Information**

Source	Source Type	N Concentration	P Concentration	K Concentration	Water Extractable P	Ammonia N
Manure	Local Manure	1.00%	0.10%	0.00%	0.00%	0.00%
Other	Other	1.00%	0.10%	0.00%	0.00%	0.00%

**Nutrient Loss and Generation Factors**

Source	N Loss	P Loss	K Loss
Manure	0.00%	0.00%	0.00%
Other	0.00%	0.00%	0.00%

**Estimated Plant Available Nutrients**

Source	N Concentration	P Concentration	K Concentration	Water Extractable P
Manure	1.00%	0.10%	0.00%	0.00%
Other	1.00%	0.10%	0.00%	0.00%

**Field P Loss Calculations**

Field	Soil Test P	Soil Map Use	Soil Loss	Soil Loss	Soil Loss	Soil Loss	Soil Loss	Soil Loss	Soil Loss	Soil Loss	Soil Loss	Soil Loss
Field 1	10	10	10	10	10	10	10	10	10	10	10	10
Field 2	10	10	10	10	10	10	10	10	10	10	10	10

**Field P Loss Calculations (continued)**

Field	Soil Test P	Soil Map Use	Soil Loss	Soil Loss	Soil Loss	Soil Loss	Soil Loss	Soil Loss	Soil Loss	Soil Loss	Soil Loss	Soil Loss
Field 3	10	10	10	10	10	10	10	10	10	10	10	10
Field 4	10	10	10	10	10	10	10	10	10	10	10	10

**Field P Loss Calculations (continued)**

Field	Soil Test P	Soil Map Use	Soil Loss	Soil Loss	Soil Loss	Soil Loss	Soil Loss	Soil Loss	Soil Loss	Soil Loss	Soil Loss	Soil Loss
Field 5	10	10	10	10	10	10	10	10	10	10	10	10
Field 6	10	10	10	10	10	10	10	10	10	10	10	10

**Arkansas Nutrient Management Planner with 2008 PI (ver 3/2/2014)**

Project: **Stacy Clark** Date: **10/2/2010**  
 Plan Description: **0 and 0 Hog Barn**

**Field Management Practices**

Field	Location	Area	Unit	Soil Strip	Grasses	Wetlands	Field #	Repar	Repar	Field	Field	Field
								Rate	Rate	Dist	P Value	Range
2010			28	205				100	100	66		Medium
2011								100	100	66		Medium
2012								100	100	66		Medium
2013								100	100	66		Medium
2014								100	100	66		Medium
2015								100	100	66		Medium
2016								100	100	66		Medium
2017								100	100	66		Medium
2018								100	100	66		Medium
2019								100	100	66		Medium
2020								100	100	66		Medium

**Field Nutrient Application Practices**

Per Acre Basis

Field	Harvest	Rate	Application	Harvest Recommendation (lb)	Harvest	Recom	Recom	Recom	Recom	Recom	Recom	Recom	Recom
				N	P2O5	K2O	S	Zn	Cu	Mn	B	Mo	Ca
2010	Soil	22.42	1100	1000 gal	480	0	1.20	4.20	5.00	1.20	0.20	0.20	1.20
2011	Soil	14.41	1100	1000 gal	480	0	1.20	4.20	5.00	1.20	0.20	0.20	1.20
2012	Soil	14.41	1100	1000 gal	480	0	1.20	4.20	5.00	1.20	0.20	0.20	1.20
2013	Soil	14.41	1100	1000 gal	480	0	1.20	4.20	5.00	1.20	0.20	0.20	1.20
2014	Soil	20.44	1100	1000 gal	480	0	1.20	4.20	5.00	1.20	0.20	0.20	1.20
2015	Soil	16.47	1100	1000 gal	480	0	1.20	4.20	5.00	1.20	0.20	0.20	1.20
2016	Soil	24.41	1100	1000 gal	480	0	1.20	4.20	5.00	1.20	0.20	0.20	1.20
2017	Soil												
2018	Soil												
2019	Soil												
2020	Soil												

Per Field Basis

Field	Harvest	Rate	Application	Harvest Recommendation (lb)	Harvest	Recom	Recom	Recom	Recom	Recom	Recom	Recom	Recom
				N	P2O5	K2O	S	Zn	Cu	Mn	B	Mo	Ca
2010	Soil	683.12	1000 gal	480	0	1.20	4.20	5.00	1.20	0.20	0.20	0.20	1.20
2011	Soil	150.41	1000 gal	480	0	1.20	4.20	5.00	1.20	0.20	0.20	0.20	1.20
2012	Soil	52.34	1000 gal	480	0	1.20	4.20	5.00	1.20	0.20	0.20	0.20	1.20
2013	Soil	150.41	1000 gal	480	0	1.20	4.20	5.00	1.20	0.20	0.20	0.20	1.20
2014	Soil	190.22	1000 gal	480	0	1.20	4.20	5.00	1.20	0.20	0.20	0.20	1.20
2015	Soil	457.41	1000 gal	480	0	1.20	4.20	5.00	1.20	0.20	0.20	0.20	1.20
2016	Soil	215.37	1000 gal	480	0	1.20	4.20	5.00	1.20	0.20	0.20	0.20	1.20
2017	Soil	247.68	1000 gal	480	0	1.20	4.20	5.00	1.20	0.20	0.20	0.20	1.20
2018	Soil												
2019	Soil												
2020	Soil												
Total		1730	434	1200	0	1.20	4.20	5.00	1.20	0.20	0.20	0.20	1.20



## **Section 6 NUTRIENT MANAGEMENT**

**Field identification specific numbers/or unique identification codes**

**Manure application setback distances**

**Soil test data**

**Manure analysis**

**Manure application calendar**

**Planned nutrient applications**

**Application equipment descriptions and methods of application**

**Estimated application amounts per acre**

**Field nutrient balance**

**Manure inventory summary**

**Fertilize material annual summary**

**Farm nutrient balance**

Land Base

There is approximately 616.5 acres of pastureland available for waste application and utilization from this operation. Approximately 25.2 of these acres are on the farm with the additional acreage being on local farms. Signed easements, with these other landowners, have been obtained to allow waste application. All waste application areas are predominantly bermudagrass/fescue hay lands and pastures. The following table summarizes the application areas:

Field No.	Owner Name	Section	Township	Range	Total Available Acres
CCGW	C & C Hog Barn	34	15 N	21 W	20.0
CC1	C & C Hog Barn	34	15 N	21 W	5.2
JG-A	John Gunter	33,34	15 N	21 W	14.0
JG-B	John Gunter	34	15 N	21 W	3.0
EC-A	Eugene Casey	4	14 N	21 W	4.8
EC-B	Eugene Casey	4	14 N	21 W	9.7
DC	Daryl Campbell	34	15 N	21 W	15.7
HB1	Harl Bohannon	30	14 N	21 W	11.1
HB2	Harl Bohannon	20,29	14 N	21 W	19.7
HB3	Harl Bohannon	28	14 N	21 W	9.9
LCM1	Lynn Carl Middleton	14,22,23	14 N	21 W	18.5
LCM2	Lynn Carl Middleton	14,22,23	14 N	21 W	16.2
LCM3	Lynn Carl Middleton	14,22,23	14 N	21 W	19.1
RM1	Robert Middleton	36	15 N	21 W	82.2
RM2	Robert Middleton	25 & 36	15 N	21 W	21.4
MM1	Mike Middleton	29	15 N	20 W	3.1
MM2	Mike Middleton	28 & 29	15 N	20 W	29.8
MM3	Mike Middleton	29	15 N	20 W	10.9
RC3	Richard Campbell	29	15 N	20 W	12.0
RC4	Richard Campbell	33	15 N	20 W	18.4
PC1	Phillip Campbell	28 & 33	15 N	20 W	18.3
CB1	Charles Burdine	21	15 N	20 W	7.2
CB2	Charles Burdine	20 & 21	15 N	20 W	33.9
CB3	Charles Burdine	21	15 N	20 W	2.1
CB4	Charles Burdine	20 & 21	15 N	20 W	16.1
CB5	Charles Burdine	20	15 N	20 W	1.8
CB6	Charles Burdine	20	15 N	20 W	13.3
CB7	Charles Burdine	20	15 N	20 W	44.0
CB8	Charles Burdine	20	15 N	20 W	6.5
CB9	Charles Burdine	19 & 20	15 N	20 W	20.2

CB10	Charles Burdine	19 & 20	15 N	20 W	30.2
CB11	Charles Burdine	20	15 N	20 W	10.7
CB12	Charles Burdine	20	15 N	20 W	4.4
CB13	Charles Burdine	19	15 N	20 W	10.1
EM1	Ed Mills	33	15 N	21 W	6.6
GD1	Gary Dotson	5	13 N	20 W	10.2
VIV1	Ricky Campbell	15	14 N	21 W	22.9
VIV1A	Ricky Campbell	15	14 N	21 W	13.3
<b>Total Acres</b>					<b>616.5</b>

**Pasture Management**

Land application areas used for waste utilization are predominantly bermudagrass/fescue fields, used for hay production and pasture. Annual soil tests shall be used to determine plant nutrient needs and fertilizer, including animal wastes, application rates.

**Mortality Management**

The planned method of mortality management is to remove dead animals from the operational site and to deliver the carcasses to a rendering facility. As a part of this CNMP, a swine composting facility should be considered to handle expected mortality. Additionally, area(s) shall be determined and shown on the maps for a catastrophic burial site(s) in case of mass mortality.

**Irrigation Water Management**

Manure and wastewater from the storage ponds is transported via liquid manure truck and applied to the fields. Calibration information for both the sprinkler system and liquid manure truck are included in this CNMP. An irrigation system may be planned in the future, to apply liquid wastes to fields where applicable.



# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity affirmative action institution

RICHARD CAMPBELL	Client ID: 8704345974
PO BOX 45	
VENDER	AR 72683
Date Processed:	6/11/2010
Field ID:	CC1
Acres	4
Lime Applied in the last 4 years:	No
Labeled in past 4 years:	No
Irrigation:	Unknown
County:	Newton
Lab Number:	75160
Sample Number:	1010408

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich 3)
	ppm	lb/acre	
P	514	1028	Above Optimum
K	83	188	Medium
Ca	980	1960	--
Mg	234	468	--
SO4-S	12	24	--
Zn	31.6	63.2	--
Fe	210	420	--
Mn	132	264	--
Cu	12.8	25.8	--
B	0.3	0.6	--
NO3-N	31	62	--

## 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	5.7	--
Soil EC (1:2 soil-water)	72	umhos/cm
Soil ECEC	11	cmolc/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silt Loam	

Estimated Base Saturation (%)				
Total	Ca	Mg	K	Na
64.1	44.0	17.5	2.1	0.5

## 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop	N	P2O5	K2O	SO4S	Zn	B	Lime
Last Crop	Hay (124)						
Crop 1	Hay - Cool-Season Grasses (MNT) - 4 ton/acre (124)						
Crop 2							4000
Crop 3							

### 4. Crop 1 Notes:

For optimum fertilizer use efficiency, divide the recommended rates of N, P, and K by the estimated number of hay harvests per year and apply fertilizer in split applications beginning at green-up and following each hay harvest.

### 5. Crop 2 Notes:

### 6. Crop 3 Notes:

# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity/affirmative action institution.

RICHARD CAMPBELL	Client ID:	8704345974
PO BOX 45		
VENDER	AR	72683
Date Processed:	6/11/2010	
Field ID:	CCGW	
Acres	28	
Lime Applied in the last 4 years:	No	
Leveled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	75161	
Sample Number:	1010409	

### 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich 3)
	ppm	lb/acre	
P	335	670	Above Optimum
K	295	590	Above Optimum
Ca	1050	2100	--
Mg	204	408	--
SO4-S	10	20	--
Zn	16.1	32.2	--
Fe	147	294	--
Mn	241	482	--
Cu	8.0	16.0	--
B	0.4	0.8	--
NO3-N	19	38	--

### 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	6.1	--
Soil EC (1:2 soil-water)	48	umhos/cm
Soil ECEC	11	cmolc/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silt Loam	

Estimated Base Saturation (%)				
Total	Ca	Mg	K	Na
72.1	48.8	15.8	7.0	0.6

### 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop	N	P2O5	K2O	SO4S	Zn	B	Lime
Last Crop	Hay (124)						
Crop 1	160	0	0	0	0	0	0
Crop 2							
Crop 3							

#### 4. Crop 1 Notes:

For optimum fertilizer use efficiency, divide the recommended rates of N, P, and K by the estimated number of hay harvests per year and apply fertilizer in split applications beginning at green-up and following each hay harvest.

#### 5. Crop 2 Notes:

#### 6. Crop 3 Notes:

# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity/affirmative action institution

RICHARD CAMPBELL PO BOX 45 VENDER	Client ID: 8704345974 AR 72683
Date Processed:	6/11/2010
Field ID:	EC
Acres:	15
Lime Applied in the last 4 years:	No
Leveled in past 4 years:	No
Irrigation:	Unknown
County:	Newton
Lab Number:	75159
Sample Number:	1010407

### 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich 3)
	ppm	lb/acre	
P	105	210	Above Optimum
K	39	78	Very Low
Ca	397	794	--
Mg	78	156	--
SO4-S	10	20	--
Zn	3.4	6.8	--
Fe	119	238	--
Mn	124	248	--
Cu	1.8	3.6	--
B	0.1	0.2	--
NO3-N	20	40	--

### 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	5.2	--
Soil EC (1:2 soil-water)	46	umhos/cm
Soil ECEC	8	cmolc/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Sandy Loam	

Estimated Base Saturation (%)				
Total	Ca	Mg	K	Na
33.6	24.0	7.8	1.2	0.6

### 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop		N	P2O5	K2O	SO4S	Zn	B	Lime
		lb/acre						
Last Crop	Pasture (203)							
Crop 1	Pasture - Cool-Season Grasses (MNT) (203)	60	0	120	0	0	0	4000
Crop 2								
Crop 3								

#### 4. Crop 1 Notes:

Apply the recommended rate of N, P, and K in late winter. For higher production apply an additional 50 lb N/Acre after every 4 to 6 weeks of grazing. For fall/winter grazing, apply 50 lbs N/Acre in late summer.

#### 5. Crop 2 Notes:

#### 6. Crop 3 Notes:

# UofA UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity/affirmative action institution

RICHARD CAMPBELL	Client ID:	8704345974
PO BOX 45		
VENDER	AR	72683
Date Processed:	6/11/2010	
Field ID:	JG	
Acres	19	
Lime Applied in the last 4 years:	No	
Leveled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	75158	
Sample Number:	1010406	

### 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (N-Min/EN-3)
	ppm	(lb/acre)	
P	205	410	Above Optimum
K	39	78	Very Low
Ca	558	1112	--
Mg	138	272	--
SO4-S	15	30	--
Zn	7.8	15.6	--
Fa	163	326	--
Mn	197	394	--
Cu	4.5	9.0	--
B	0.2	0.4	--
NO3-N	24	48	--

### 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	5.5	--
Soil EC (1:2 soil-water)	124	umhos/cm
Soil ECEC	9	cmole/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silt Loam	

#### Estimated Base Saturation (%)

Total	Ca	Mg	K	Na
47.4	32.5	13.2	1.2	0.6

### 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop		N	P2O5	K2O	SO4S	Zn	B	Lime
		lb/acre						
Last Crop	Pasture (203)							
Crop 1	Pasture - Cool-Season Grasses (MNT) (203)	60	0	120	0	0	0	4000
Crop 2								
Crop 3								

#### 4. Crop 1 Notes:

Apply the recommended rate of N, P, and K in late winter. For higher production apply an additional 50 lb N/Acre after every 4 to 6 weeks of grazing. For fall/winter grazing, apply 50 lbs N/Acre in late summer.

#### 5. Crop 2 Notes:

#### 6. Crop 3 Notes:

# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity/affirmative action institution

RICHARD CAMPBELL	Client ID:	8704345974
PO BOX 45		
VENDER	AR	72683
Date Processed:	6/11/2010	
Field ID:	DC	
Acres:	20	
Lime Applied in the last 4 years:	No	
Leveled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	75162	
Sample Number:	1010410	

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich 3)
	ppm	lb/acre	
P	84	128	Above Optimum
K	89	176	Low
Ca	673	1346	--
Mg	116	236	--
SO4-S	11	22	--
Zn	3.9	7.8	--
Fa	90	180	--
Mn	262	524	--
Cu	1.7	3.4	--
B	0.2	0.4	--
NO3-N	19	38	--

## 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	5.6	---
Soil EC (1:2 soil-water)	39	umhos/cm
Soil ECEC	9	cmolc/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silt Loam	

### Estimated Base Saturation (%)

Total	Ca	Mg	K	Na
63.6	39.0	11.4	2.6	0.5

## 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop	N	P2O5	K2O	SO4S	Zn	B	Lime
Last Crop Pasture (203)							
Crop 1 Pasture - Cool-Season Grasses (MNT) (203)	60	0	80	0	0	0	4000
Crop 2							
Crop 3							

### 4. Crop 1 Notes:

Apply the recommended rate of N, P, and K in late winter. For higher production apply an additional 50 lb N/Acre after every 4 to 6 weeks of grazing. For fall/winter grazing, apply 50 lbs N/Acre in late summer.

### 5. Crop 2 Notes:

### 6. Crop 3 Notes:

# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72380  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity/affirmative action institution

LYNN CARL MIDDLETON	Client ID:	8704285966
HC 31 BOX 166		
JASPER	AR	72641
Date Processed:	8/20/2010	
Field ID:	LCM 1	
Acres	40	
Lime Applied in the last 4 years:	No	
Leveled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	80313	
Sample Number:	1010571	

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Meilich's)
	ppm	lb/acre	
P	37	74	Optimum
K	48	96	Very Low
Ca	1837	3274	--
Mg	47	94	--
SO4-S	11	22	--
Zn	1.6	3.2	--
Fe	81	162	--
Mn	128	256	--
Cu	0.8	1.6	--
B	0.0	0.0	--
NO3-N	9	18	--

## 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	6.6	--
Soil EC (1:2 soil-water)	51	umhos/cm
Soil ECEC	12	cmole/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silt Loam - Silty Clay Loam	

Estimated Base Saturation (%)				
Total	Ca	Mg	K	Na
74.5	69.5	3.3	1.0	0.6

## 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop	N	P2O5	K2O	SO4S	Zn	B	Lime
Last Crop Pasture (203)							
Crop 1 Pasture - Cool-Season Grasses (MNT) (203)	60	0	120	0	0	0	0
Crop 2							
Crop 3							

## 4. Crop 1 Notes:

Apply the recommended rate of N, P, and K in late winter. For higher production apply an additional 50 lb N/Acre after every 4 to 6 weeks of grazing. For fall/winter grazing, apply 50 lb N/Acre in late summer.

## 5. Crop 2 Notes:

## 6. Crop 3 Notes:

# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity/affirmative action institution

LYNN CARL MIDDLETON	Client ID:	8704285966
HC 31 BOX 166		
JASPER	AR	72641
Date Processed:	8/20/2010	
Field ID:	LCM 2	
Acres	40	
Lime Applied in the last 4 years:	No	
Leveled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	80314	
Sample Number:	1010572	

### 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich 3)
	ppm	lb/acre	
P	22	44	Low
K	54	108	Very Low
Ca	823	1646	--
Mg	56	112	--
SO4-S	12	24	--
Zn	1.7	3.4	--
Fe	106	212	--
Mn	270	540	--
Cu	0.8	1.6	--
B	0.0	0.0	--
NO3-N	9	18	--

### 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	5.4	--
Soil EC (1:2 soil-water)	46	umhos/cm
Soil ECEC	9	cmole/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silt Loam	

Estimated Base Saturation (%)				
Total	Ca	Mg	K	Na
51.5	44.3	5.0	1.5	0.7

### 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop	N	P2O5	K2O	SO4S	Zn	B	Lime
Last Crop   Pasture (203)							
Crop 1   Pasture - Cool-Season Grasses (MNT) (203)	60	70	120	0	0	0	5000
Crop 2							
Crop 3							

### 4. Crop 1 Notes:

Apply the recommended rate of N, P, and K in late winter. For higher production apply an additional 50 lb N/Acre after every 4 to 6 weeks of grazing. For fall/winter grazing, apply 60 lbs N/Acre in late summer.

### 5. Crop 2 Notes:

### 6. Crop 3 Notes:

# UofA UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72380  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity affirmative action institution

LYNN CARL MIDDLETON	Client ID:	8704285966
HC 31 BOX 168		
JASPER	AR	72641
Date Processed:	8/20/2010	
Field ID:	LCM 3	
Acres	40	
Lime Applied in the last 4 years:	No	
Leveled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	80315	
Sample Number:	1010573	

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich 3)
	ppm	lb/acre	
P	27	54	Medium
K	59	116	Very Low
Ca	1191	2382	--
Mg	77	154	--
SO4-S	12	24	--
Zn	2.4	4.8	--
Fe	139	278	--
Mn	200	400	--
Cu	1.5	3.0	--
B	0.0	0.0	--
NO3-N	17	34	--

## 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	5.6	--
Soil EC (1:2 soil-water)	64	umhos/cm
Soil ECEC	11	cmolc/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silt Loam - Silty Clay Loam	

Estimated Base Saturation (%)				
Total	Ca	Mg	K	Na
60.2	52.6	5.7	1.3	0.6

## 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop		N	P2O5	K2O	SO4S	Zn	B	Lime
Last Crop	Pasture (203)							
Crop 1	Pasture - Cool-Season Grasses (MNT) (203)	60	40	120	0	0	0	4000
Crop 2								
Crop 3								

## 4. Crop 1 Notes:

Apply the recommended rate of N, P, and K in late winter. For higher production apply an additional 50 lb N/Acre after every 4 to 6 weeks of grazing. For fall/winter grazing, apply 60 lbs N/Acre in late summer.

## 5. Crop 2 Notes:

## 6. Crop 3 Notes:



# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity affirmative action institution

RICHARD CAMPBELL	Client ID:	8704345974
PO BOX 45		
VENDER	AR	72683
Date Processed:	8/10/2010	
Field ID:	MM 3	
Acres	13	
Lime Applied in the last 4 years:	No	
Leveled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	78648	
Sample Number:	1010494	

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich 3)
	ppm	lb/acre	
P	76	152	Above Optimum
K	104	208	Medium
Ca	1909	3818	--
Mg	90	180	--
SO4-S	9	18	--
Zn	9.6	19.2	--
Fe	144	288	--
Mn	156	312	--
Cu	2.5	6.0	--
B	0.1	0.2	--
NO3-N	15	30	--

## 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	6.4	--
Soil EC (1:2 soil-water)	47	umhos/cm
Soil ECEC	14	cmolc/kg
Organic Matter (Loss on ignition)		%
Estimated Soil Texture	Silt Loam - Silty Clay Loam	

Estimated Base Saturation (%)				
Total	Ca	Mg	K	Na
75.2	67.6	6.3	1.9	0.3

## 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop	Group	N	P2O5	K2O	SO4S	Zn	B	Lime
Last Crop	Pasture (203)							
Crop 1	Pasture - Cool-Season Grasses (MNT) (203)	60	0	50	0	0	0	0
Crop 2								
Crop 3								

### 4. Crop 1 Notes:

Apply the recommended rate of N, P, and K in late winter. For higher production apply an additional 50 lb N/Acre after every 4 to 6 weeks of grazing. For fall/winter grazing, apply 60 lbs N/Acre in late summer.

### 5. Crop 2 Notes:

### 6. Crop 3 Notes:

# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72380  
<http://www.uark.edu/dapts/soiltest>

*The University of Arkansas is an equal opportunity/affirmative action institution.*

RICHARD CAMPBELL PO BOX 45 VENDER	Client ID: 8704345974 AR 72683
Date Processed:	8/10/2010
Field ID:	PC 1
Acres:	25
Lime Applied in the last 4 years:	No
Leveled in past 4 years:	No
Irrigation:	Unknown
County:	Newton
Lab Number:	78647
Sample Number:	1010495

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich's)
	ppm	lb/acre	
P	85	170	Above Optimum
K	217	434	Above Optimum
Ca	1199	2398	--
Mg	154	308	--
SO4-S	18	36	--
Zn	4.6	9.0	--
Fe	143	286	--
Mn	239	478	--
Cu	1.3	2.6	--
B	0.1	0.2	--
NO3-N	45	90	--

## 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	5.5	--
Soil EC (1:2 soil-water)	59	umhos/cm
Soil ECEC	13	cmolc/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silt Loam - Silty Clay Loam	

### Estimated Base Saturation (%)

Total	Ca	Mg	K	Na
59.0	44.7	9.6	4.1	0.7

## 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop	Crop	N	P2O5	K2O	SO4S	Zn	B	Lime
		-----lb/acre-----						
Last Crop	Pasture (203)							
Crop 1	Pasture - Cool-Season Grasses (MNT) (203)	60	0	0	0	0	0	4000
Crop 2								
Crop 3								

### 4. Crop 1 Notes:

Apply the recommended rate of N, P, and K in late winter. For higher production apply an additional 50 lb N/Acre after every 4 to 6 weeks of grazing. For fall/winter grazing, apply 50 lbs N/Acre in late summer.

### 5. Crop 2 Notes:

### 6. Crop 3 Notes:

# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depta/soiltest>

The University of Arkansas is an equal opportunity affirmative action institution

RICHARD CAMPBELL	Client ID:	6704345974
PO BOX 45		
VENDER	AR	72683
Date Processed:	6/10/2010	
Field ID:	MM 1	
Acres	18	
Lime Applied in the last 4 years:	No	
Leveled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	79648	
Sample Number:	1010496	

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich 3)
	ppm	lb/acre	
P	150	300	Above Optimum
K	65	170	Low
Ca	2635	5270	-
Mg	110	220	-
SO4-S	11	22	-
Zn	10.9	21.8	-
Fe	184	368	-
Mn	281	522	-
Cu	3.7	7.4	-
B	0.5	1.0	-
NO3-N	35	70	-

## 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	6.4	-
Soil EC (1:2 soil-water)	70	umhos/cm
Soil ECEC	18	cmole/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silty Clay Loam - Clay Loam	

### Estimated Base Saturation (%)

Total	Ca	Mg	K	Na
60.4	73.7	5.1	1.2	0.3

## 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop	N	P2O5	K2O	SO4S	Zn	B	Lime
Last Crop	-----lb/acre-----						
Crop 1	60	0	80	0	0	0	0
Crop 2							
Crop 3							

### 4. Crop 1 Notes:

Apply the recommended rate of N, P, and K in late winter. For higher production apply an additional 50 lb N/Acre after every 4 to 6 weeks of grazing. For fall/winter grazing, apply 50 lbs N/Acre in late summer.

### 5. Crop 2 Notes:

### 6. Crop 3 Notes:

# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity/affirmative action institution.

RICHARD CAMPBELL PO BOX 45 VENDER	Client ID: 8704345974 AR 72683
Date Processed:	8/10/2010
Field ID:	RC 4
Acres:	29
Lime Applied in the last 4 years:	No
Leveled in past 4 years:	No
Irrigation:	Unknown
County:	Newton
Lab Number:	79649
Sample Number:	1010497

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich 3)
	ppm	lb/acre	
P	26	52	Medium
K	236	472	Above Optimum
Ca	868	1732	--
Mg	113	226	--
SO4-S	13	26	--
Zn	3.7	7.4	--
Fe	108	216	--
Mn	518	1032	--
Cu	1.1	2.2	--
B	0.1	0.2	--
NO3-N	16	32	--

## 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	6.1	--
Soil EC (1:2 soil-water)	65	umhos/cm.
Soil ECEC	9	cmolc/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silt Loam	

### Estimated Base Saturation (%)

Total	Ca	Mg	K	Na
66.4	48.5	10.6	6.8	0.5

## 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop	H	P205	K2O	SO4S	Zn	B	Lime
Last Crop Pasture (203)							
Crop 1 Pasture - Cool-Season Grasses (MNT) (203)	60	40	0	0	0	0	0
Crop 2							
Crop 3							

### 4. Crop 1 Notes:

Apply the recommended rate of N, P, and K in late winter. For higher production apply an additional 50 lb N/Acre after every 4 to 6 weeks of grazing. For fall/winter grazing, apply 50 lbs N/Acre in late summer.

### 5. Crop 2 Notes:

### 6. Crop 3 Notes:

# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity institution.

RICHARD CAMPBELL	Client ID:	8704345974
PO BOX 45		
VENDER	AR	72683
Date Processed:	8/10/2010	
Field ID:	MM 2	
Acres	33	
Lime Applied in the last 4 years:	No	
Leveled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	79650	
Sample Number:	1010498	

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich 3)
	ppm	lb/acre	
P	99	198	Above Optimum
K	109	218	Medium
Ca	2783	5566	--
Mg	112	224	--
SO4-S	12	24	--
Zn	8.1	16.2	--
Fe	207	414	--
Mn	219	438	--
Cu	2.7	5.4	--
B	0.4	0.8	--
NO3-N	31	62	--

## 2. Soil Properties

Property	Value	Unit
Soil pH (1:2 soil-water)	6.4	--
Soil EC (1:2 soil-water)	60	umhos/cm
Soil ECEC	19	cmole/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silty Clay Loam - Clay Loam	

### Estimated Base Saturation (%)

Total	Ca	Mg	K	Na
81.3	74.5	5.0	1.5	0.3

## 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop	N	P2O5	K2O	SO4S	Zn	S	Lime
Last Crop	Pasture (203)						
Crop 1	60	0	50	0	0	0	0
Crop 2							
Crop 3							

### 4. Crop 1 Notes:

Apply the recommended rate of N, P, and K in late winter. For higher production apply an additional 50 lb N/Acre after every 4 to 6 weeks of grazing. For fall/winter grazing, apply 50 lbs N/Acre in late summer.

### 5. Crop 2 Notes:

### 6. Crop 3 Notes:

# UofA UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity/affirmative action institution

RICHARD CAMPBELL	Client ID:	8704345974
PO BOX 45		
VENDER	AR	72883
Date Processed:	8/10/2010	
Field ID:	RC 3	
Acres	14	
Lime Applied in the last 4 years:	No	
Leveled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	79651	
Sample Number:	1010499	

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich 3)
	ppm	lb/acre	
P	79	158	Above Optimum
K	61	122	Low
Ca	976	1952	--
Mg	67	134	--
SO4-S	18	38	--
Zn	5.4	10.8	--
Fe	199	398	--
Mn	309	618	--
Cu	1.9	3.8	--
B	0.0	0.0	--
NO3-N	35	70	--

## 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	5.4	--
Soil EC (1:2 soil-water)	60	umhos/cm
Soil ECEC	10	cmolc/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silt Loam	

### Estimated Base Saturation (%)

Total	Ca	Mg	K	Na
55.8	47.9	5.5	1.5	0.9

## 3. Recommendations

(Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop	N	P2O5	K2O	SO4S	Zn	B	Lime
Least Crop	----- lb/acre -----						
Crop 1	Pasture (207)	60	0	110	0	0	5000
Crop 2	Warm-Season Grasses (MNT) (207)						
Crop 3							

### 4. Crop 1 Notes:

Apply the recommended rates of N, P, and K, in spring when night temperatures are > 60 degrees F for 1 week. For higher production, topdress an additional 60 lb N/Acre after every 4 to 8 weeks of grazing. For fall grazing apply 50 lb N/Acre in early August. Do not apply N after September 1.

### 5. Crop 2 Notes:

### 6. Crop 3 Notes:

# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity affirmative action institution.

RICHARD CAMPBELL	Client ID:	8704345974
PO BOX 45		
VENDER	AR	72883
Date Processed:	8/10/2010	
Field ID:	RM 2	
Acres	38	
Lime Applied in the last 4 years:	No	
Leveled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	70652	
Sample Number:	1010500	

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich 3)
	ppm	lb/acre	
P	124	248	Above Optimum
K	171	342	Optimum
Ca	1131	2262	--
Mg	162	324	--
SO4-S	14	28	--
Zn	8.6	17.0	--
Fe	234	468	--
Mn	263	526	--
Cu	1.5	3.0	--
B	0.2	0.4	--
NO3-N	23	46	--

## 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	6.2	---
Soil EC (1:2 soil-water)	68	umho/cm
Soil ECEC	10	cmole/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silt Loam	

### Estimated Base Saturation (%)

Total	Ca	Mg	K	Na
71.4	54.0	12.9	4.2	0.3

## 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop		N	P2O5	K2O	SO4S	Zn	B	Lime
Last Crop	Pasture (212)							
Crop 1	Mixed Cool and Warm-Season Grasses for Pasture (212)	60	0	40	0	0	0	0
Crop 2								
Crop 3								

### 4. Crop 1 Notes:

To favor cool-season grasses, apply N in late winter. To favor warm-season grasses, do not apply N until May 1. For higher production, topdress 50 lb N/Acre after every 4-6 weeks of grazing or as needed.

### 5. Crop 2 Notes:

### 6. Crop 3 Notes:

# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity affirmative action institution.

RICHARD CAMPBELL	Client ID:	8704345974
PO BOX 45		
VENDER	AR	72683
Date Processed:	8/10/2010	
Field ID:	RM 1	
Acres	109	
Lime Applied in the last 4 years:	No	
Leveled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	79653	
Sample Number:	1010501	

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich 3)
	ppm	lb/acre	
P	12	24	Very Low
K	197	394	Above Optimum
Ca	687	1374	--
Mg	88	176	--
SO4-S	10	20	--
Zn	2.0	4.0	--
Fa	99	198	--
Mn	446	892	--
Cu	0.7	1.4	--
B	0.1	0.2	--
NO3-N	25	50	--

## 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	6.1	--
Soil EC (1:2 soil-water)	65	umhos/cm
Soil ECEC	6	cmolc/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silt Loam	

### Estimated Base Saturation (%)

Total	Ca	Mg	K	Na
61.1	44.6	9.5	6.6	0.5

## 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop	N	P2O5	K2O	SO4S	Zn	B	Lime
Last Crop	Pasture (203)						
Crop 1	60	100	0	0	0	0	0
Crop 2							
Crop 3							

### 4. Crop 1 Notes:

Apply the recommended rate of N, P, and K in late winter. For higher production apply an additional 50 lb N/Acre after every 4 to 6 weeks of grazing. For fall/winter grazing, apply 50 lbs N/Acre in late summer.

### 5. Crop 2 Notes:

### 6. Crop 3 Notes:



# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity affirmative action institution

RICHARD CAMPBELL	Client ID:	8704345974
PO BOX 45		
VENDER	AR	72683
Date Processed:	9/8/2010	
Field ID:	H81	
Acres	17	
Lime Applied in the last 4 years:	No	
Leveled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	81752	
Sample Number:	1010937	

### 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich 3)
	ppm	lb/acre	
P	23	45	Low
K	84	168	Low
Ca	1345	2690	--
Mg	84	168	--
SO4-S	18	36	--
Zn	3.8	7.2	--
Fe	108	212	--
Mn	332	664	--
Cu	1.3	2.6	--
B	0.0	0.0	--
NO3-N	1	2	--

### 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	6.2	--
Soil EC (1:2 soil-water)	50	umhos/cm
Soil ECEC	11	cmolc/kg
Organic Matter (Loss on ignition)		%
Estimated Soil Texture	Silt Loam	

Estimated Base Saturation (%)				
Total	Ca	Mg	K	Na
71.8	62.9	6.6	2.0	0.4

### 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop		N	P2O5	K2O	SO4S	Zn	B	Lime
		lb/acre						
Last Crop	Pasture (203)							
Crop 1	Pasture - Cool-Season Grasses (MNT) (203)	60	70	80	0	0	0	0
Crop 2								
Crop 3								

#### 4. Crop 1 Notes:

Apply the recommended rate of N, P, and K in late winter. For higher production apply an additional 50 lb N/Acre after every 4 to 6 weeks of grazing. For fall/winter grazing, apply 50 lbs N/Acre in late summer.

#### 5. Crop 2 Notes:

#### 6. Crop 3 Notes:

# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity affirmative action institution.

RICHARD CAMPBELL	Client ID:	8704345974
PO BOX 45		
VENDER	AR	72683
Date Processed:	9/8/2010	
Field ID:	H82	
Acres	33	
Lime Applied in the last 4 years:	No	
Labeled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	81753	
Sample Number:	1010638	

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich 3)
	ppm	lb/acre	
P	18	36	Low
K	112	224	Medium
Ca	569	1178	--
Mg	78	156	--
SO4-S	18	36	--
Zn	3.0	6.0	--
Fe	119	238	--
Mn	132	264	--
Cu	0.9	1.8	--
B	0.0	0.0	--
NO3-N	1	2	--

## 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	5.5	--
Soil EC (1:2 soil-water)	33	umhos/cm
Soil ECEC	8	cmole/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silt Loam	

### Estimated Base Saturation (%)

Total	Ca	Mg	K	Na
46.5	35.0	7.7	3.4	0.4

## 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop	N	P2O5	K2O	SO4S	Zn	B	Lime
Last Crop Pasture (203)							
Crop 1 Pasture - Cool-Season Grasses (MNT) (203)	60	70	50	0	0	0	4000
Crop 2							
Crop 3							

### 4. Crop 1 Notes:

Apply the recommended rate of N, P, and K in late winter. For higher production apply an additional 50 lb N/Acre after every 4 to 6 weeks of grazing. For fall/winter grazing, apply 50 lbs N/Acre in late summer.

### 5. Crop 2 Notes:

### 6. Crop 3 Notes:

# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity affirmative action institution.

RICHARD OAMPBELL	Client ID:	8704345974
PO BOX 45		
VENDER	AR	72683
Date Processed:	9/8/2010	
Field ID:	HB 3	
Acres	16	
Lime Applied in the last 4 years:	No	
Leveled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	81764	
Sample Number:	1010639	

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich's)
	ppm	lb/acre	
P	26	52	Medium
K	72	144	Low
Ca	352	704	--
Mg	60	120	--
SO4-S	23	46	--
Zn	3.2	6.4	--
Fe	101	202	--
Mn	216	432	--
Cu	0.8	1.6	--
B	0.0	0.0	--
NO3-N	1	2	--

## 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	5.2	--
Soil EC (1:2 soil-water)	35	umhos/cm
Soil ECEC	8	cmole/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Sandy Loam	

### Estimated Base Saturation (%)

Total	Ca	Mg	K	Na
31.1	22.0	6.3	2.3	0.5

## 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop	N	P2O5	K2O	SO4S	Zn	B	Lime
Last Crop Pasture (203)							
Crop 1 Pasture - Cool-Season Grasses (MNT) (203)	60	40	80	0	0	0	4000
Crop 2							
Crop 3							

### 4. Crop 1 Notes:

Apply the recommended rate of N, P, and K in late winter. For higher production apply an additional 50 lb N/Acre after every 4 to 6 weeks of grazing. For fall/winter grazing, apply 60 lbs N/Acre in late summer.

### 5. Crop 2 Notes:

### 6. Crop 3 Notes:

# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity affirmative action institution

CHARLES BURDINE	Client ID:	8704345592
HC 72 BOX 70		
VENDER	AR	72683
Date Processed:	9/8/2010	
Field ID:	CB1	
Acres	30	
Lime Applied in the last 4 years:	No	
Leveled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	81758	
Sample Number:	1010615	

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich 3)
	ppm	lb/acre	
P	127	254	Above Optimum
K	68	138	Low
Ca	722	1444	--
Mg	73	148	--
SO4-S	22	44	--
Zn	5.1	10.2	--
Fe	151	302	--
Mn	311	622	--
Cu	1.3	2.8	--
B	0.0	0.0	--
NO3-N	27	54	--

## 2. Soil Properties

Property	Value	Units		
Soil pH (1:2 soil-water)	5.7	--		
Soil EC (1:2 soil-water)	92	umhos/cm		
Soil ECEC	8	cmole/kg		
Organic Matter (Loss on Ignition)		%		
Estimated Soil Texture	Silt Loam			
<b>Estimated Base Saturation (%)</b>				
Total	Ca	Mg	K	Na
52.6	42.8	7.2	2.1	0.6

## 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop	N	P2O5	K2O	SO4S	Zn	B	Lime
Last Crop Pasture (212)	-----lb/acre-----						
Crop 1 Mixed Cool and Warm-Season Grasses for Pasture (212)	60	0	100	0	0	0	4000
Crop 2							
Crop 3							

### 4. Crop 1 Notes:

To favor cool-season grasses, apply N in late winter. To favor warm-season grasses, do not apply N until May 1. For higher production, topdress 50 lb N/Acre after every 4-6 weeks of grazing or as needed.

### 5. Crop 2 Notes:

### 6. Crop 3 Notes:

# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity/affirmative action institution

CHARLES BURDINE	Client ID:	8704345692
HC 72 BOX 70		
VENDER	AR	72683
Date Processed:	9/8/2010	
Field ID:	CB2	
Acres	40	
Lime Applied in the last 4 years:	No	
Leveled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	81759	
Sample Number:	1010816	

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich 3)
	ppm	lb/acre	
P	265	530	Above Optimum
K	252	504	Above Optimum
Ca	1144	2288	--
Mg	157	314	--
SO4-S	27	54	--
Zn	12.4	24.8	--
Fe	173	346	--
Mn	224	448	--
Cu	1.5	3.0	--
B	0.0	0.0	--
NO3-N	80	160	--

## 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	5.6	--
Soil EC (1:2 soil-water)	222	umhos/cm
Soil ECEC	12	cmolc/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silt Loam - Silty Clay Loam	
<b>Estimated Base Saturation (%)</b>		
Total	Ca	Mg
63.2	46.7	10.7
	K	Na
	5.3	0.5

## 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop		N	P2O5	K2O	SO4S	Zn	B	Lime
Last Crop	Pasture (212)	..... lb/acre .....						
Crop 1	Mixed Cool and Warm-Season Grasses for Pasture (212)	60	0	0	0	0	0	4000
Crop 2								
Crop 3								

### 4. Crop 1 Notes:

To favor cool-season grasses, apply N in late winter. To favor warm-season grasses, do not apply N until May 1. For higher production, topdress 60 lb N/Acre after every 4-6 weeks of grazing or as needed.

### 6. Crop 2 Notes:

### 6. Crop 3 Notes:

# UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72380  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity/affirmative action institution

CHARLES BURDINE	Client ID:	8704345692
HC 72 BOX 70		
VENDER	AR	72683
Date Processed:	9/8/2010	
Field ID:	CB3	
Acres	9	
Lime Applied in the last 4 years:	No	
Leveled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	81760	
Sample Number:	1010817	

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich 3)
	ppm	lb/acre	
P	271	542	Above Optimum
K	230	460	Above Optimum
Ca	1388	2772	--
Mg	177	354	--
SO4-S	28	52	--
Zn	11.0	22.0	--
Fe	148	292	--
Mn	308	618	--
Cu	1.7	3.4	--
B	0.0	0.0	--
NO3-N	50	100	--

## 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	6.3	--
Soil EC (1:2 soil-water)	148	umhos/cm
Soil ECEC	12	cmolc/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silt Loam	

### Estimated Base Saturation (%)

Total	Ca	Mg	K	Na
75.1	57.5	12.2	4.9	0.5

## 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop	N	P2O5	K2O	SO4S	Zn	B	Lime
Last Crop	Pasture (212)						
Crop 1	60	0	0	0	0	0	0
Crop 2							
Crop 3							

### 4. Crop 1 Notes:

To favor cool-season grasses, apply N in late winter. To favor warm-season grasses, do not apply N until May 1. For higher production, topdress 50 lb N/Acre after every 4-6 weeks of grazing or as needed.

### 5. Crop 2 Notes:

### 6. Crop 3 Notes:

# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity/affirmative action institution

CHARLES BURDINE	Client ID:	8704345592
HC 72 BOX 70		
VENDER	AR	72683
Date Processed:	9/8/2010	
Field ID:	CB4	
Acres	18	
Lime Applied in the last 4 years:	No	
Leveled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	81781	
Sample Number:	1010618	

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich 3)
	ppm	lb/acre	
P	163	326	Above Optimum
K	84	168	Low
Ca	916	1830	--
Mg	92	184	--
SO4-S	18	36	--
Zn	7.2	14.4	--
Fe	199	398	--
Mn	209	418	--
Cu	1.7	3.4	--
B	0.0	0.0	--
NO3-N	15	30	--

## 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	5.4	--
Soil EC (1:2 soil-water)	53	umhos/cm
Soil ECEC	10	cmolc/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silt Loam	

### Estimated Base Saturation (%)

Total	Ca	Mg	K	Na
55.5	45.3	7.6	2.1	0.6

## 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop	N	P2O5	K2O	SO4S	Zn	B	Lime
Last Crop Pasture (212)							
Crop 1 Mixed Cool and Warm-Season Grasses for Pasture (212)	60	0	100	0	0	0	5000
Crop 2							
Crop 3							

### 4. Crop 1 Notes:

To favor cool-season grasses, apply N in late winter. To favor warm-season grasses, do not apply N until May 1. For higher production, topdress 50 lb N/Acro after every 4-6 weeks of grazing or as needed.

### 5. Crop 2 Notes:

### 6. Crop 3 Notes:

**U of A UNIVERSITY OF ARKANSAS**  
**DIVISION OF AGRICULTURE**

Cooperative Extension Service  
 Soil Analysis Report  
 Soil Testing And Research Laboratory  
 Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

*The University of Arkansas is an equal opportunity affirmative action institution*

CHARLES BURDINE	Client ID:	6704345562
HC 72 BOX 70		
VENDER	AR	72683
Date Processed:	9/8/2010	
Field ID:	CB5	
Acres	4	
Lime Applied in the last 4 years:	No	
Leveled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	81762	
Sample Number:	1010619	

**1. Nutrient Availability Index**

Nutrient	Concentration		Soil Test Level (Mehlich 3)
	ppm	lb/acre	
P	123	246	Above Optimum
K	141	282	Optimum
Ca	1651	3302	--
Mg	165	330	--
SO4-S	19	38	--
Zn	7.6	15.2	--
Fe	170	340	--
Mn	183	366	--
Cu	2.0	4.0	--
B	0.0	0.0	--
NO3-N	39	78	--

**2. Soil Properties**

Property	Value	Units		
Soil pH (1:2 soil-water)	5.8	--		
Soil EC (1:2 soil-water)	78	umhos/cm		
Soil ECEC	15	cmolc/kg		
Organic Matter (Loss on Ignition)		%		
Estimated Soil Texture	Silty Clay Loam - Clay Loam			
<b>Estimated Base Saturation (%)</b>				
Total	Ca	Mg	K	Na
68.8	54.8	9.1	2.4	0.4

**3. Recommendations** (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop	N	P2O5	K2O	SO4S	Zn	B	Lime
Last Crop   Pasture (212)	----- lb/acre -----						
Crop 1   Mixed Cool and Warm-Season Grasses for Pasture (212)	60	0	40	0	0	0	0
Crop 2							
Crop 3							

**4. Crop 1 Notes:**

To favor cool-season grasses, apply N in late winter. To favor warm-season grasses, do not apply N until May 1. For higher production, topdress 50 lb N/Acre after every 4-8 weeks of grazing or as needed.

**5. Crop 2 Notes:**

**6. Crop 3 Notes:**



# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity affirmative action institution.

CHARLES BURDINE	Client ID:	8704345592
HC 72 BOX 70		
VENDER	AR	72683
Date Processed:	9/8/2010	
Field ID:	C88	
Acres	15	
Lime Applied in the last 4 years:	No	
Leveled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	81763	
Sample Number:	1010620	

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich's)
	ppm	lb/acre	
P	183	386	Above Optimum
K	49	88	Very Low
Ca	1630	3260	--
Mg	88	176	--
SO4-S	20	40	--
Zn	6.0	12.0	--
Fe	168	336	--
Mn	175	350	--
Cu	1.9	3.8	--
B	0.0	0.0	--
NO3-N	23	46	--

## 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	5.5	---
Soil EC (1:2 soil-water)	58	umhos/cm
Soil ECEC	15	cmole/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silty Clay Loam - Clay Loam	

Estimated Base Saturation (%)				
Total	Ca	Mg	K	Na
60.2	54.0	4.9	0.8	0.5

## 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop	N	P2O5	K2O	SO4S	Zn	B	Lime
Last Crop	Pasture (212)						
Crop 1	60	0	160	0	0	0	5000
Crop 2							
Crop 3							

### 4. Crop 1 Notes:

To favor cool-season grasses, apply N in late winter. To favor warm-season grasses, do not apply N until May 1. For higher production, topdress 50 lb N/Acre after every 4-6 weeks of grazing or as needed.

### 5. Crop 2 Notes:

### 6. Crop 3 Notes:

# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity affirmative action institution

CHARLES BURDINE	Client ID:	8704345592
HC 72 BOX 70		
VENDER	AR	72683
Date Processed:	9/8/2010	
Field ID:	CB7	
Acres	55	
Lime Applied in the last 4 years:	No	
Leveled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	81764	
Sample Number:	1010821	

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich 3)
	ppm	lb/acre	
P	313	626	Above Optimum
K	365	730	Above Optimum
Ca	1402	2804	--
Mg	169	338	--
SO4-S	30	60	--
Zn	13.1	26.2	--
Fe	215	430	--
Mn	128	256	--
Cu	1.7	3.4	--
B	0.1	0.2	--
NO3-N	105	210	--

## 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	6.0	--
Soil EC (1:2 soil-water)	121	umhos/cm
Soil ECEC	13	cmolc/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silt Loam - Silty Clay Loam	

Estimated Base Saturation (%)				
Total	Ca	Mg	K	Na
72.9	54.2	10.9	7.2	0.8

## 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop		N	P2O5	K2O	SO4S	Zn	B	Lime
		lb/acre						
Last Crop	Pasture (212)							
Crop 1	Mixed Cool and Warm-Season Grasses for Pasture (212)	60	0	0	0	0	0	0
Crop 2								
Crop 3								

## 4. Crop 1 Notes:

To favor cool-season grasses, apply N in late winter. To favor warm-season grasses, do not apply N until May 1. For higher production, topdress 50 lb N/Acre after every 4-6 weeks of grazing or as needed.

## 5. Crop 2 Notes:

## 6. Crop 3 Notes:

# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity affirmative action institution

CHARLES BURDINE HC 72 BOX 70 VENDER	Client ID: 6704345592 AR 72683
Date Processed:	9/8/2010
Field ID:	CB8
Acres:	10
Lime Applied in the last 4 years:	No
Leveled in past 4 years:	No
Irrigation:	Unknown
County:	Newton
Lab Number:	81765
Sample Number:	1010622

### 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich's)
	ppm	lb/acre	
P	220	440	Above Optimum
K	250	500	Above Optimum
Ca	1487	2934	--
Mg	139	278	--
SO4-S	30	60	--
Zn	13.5	27.0	--
Fe	239	478	--
Mn	124	248	--
Cu	1.7	3.4	--
B	0.0	0.0	--
NO3-N	80	160	--

### 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	5.6	--
Soil EC (1:2 soil-water)	175	umhos/cm
Soil ECEC	14	cmolc/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silt Loam - Silty Clay Loam	

Estimated Base Saturation (%)				
Total	Ca	Mg	K	Na
67.1	53.6	8.5	4.7	0.4

### 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop	N	P2O5	K2O	SO4S	Zn	B	Lime
Last Crop: Pasture (212)	-----lb/acre-----						
Crop 1: Mixed Cool and Warm-Season Grasses for Pasture (212)	60	0	0	0	0	0	4000
Crop 2:							
Crop 3:							

#### 4. Crop 1 Notes:

To favor cool-season grasses, apply N in late winter. To favor warm-season grasses, do not apply N until May 1. For higher production, topdress 50 lb N/Acre after every 4-6 weeks of grazing or as needed.

#### 5. Crop 2 Notes:

#### 6. Crop 3 Notes:

# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
http://www.uark.edu/depts/soiltest

The University of Arkansas is an equal opportunity/affirmative action institution

CHARLES BURDINE	Client ID:	8704345592
HC 72 BOX 70		
VENDER	AR	72683
Date Processed:	9/8/2010	
Field ID:	CB9	
Acres	21	
Lime Applied in the last 4 years:	No	
Leveled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	81768	
Sample Number:	1010823	

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich 3)
	ppm	lb/acre	
P	188	396	Above Optimum
K	258	518	Above Optimum
Ca	1462	2924	--
Mg	160	320	--
SO4-S	25	50	--
Zn	13.0	26.0	--
Fe	341	682	--
Mn	63	126	--
Cu	3.3	6.6	--
B	0.0	0.0	--
NO3-N	34	68	--

## 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	5.6	--
Soil EC (1:2 soil-water)	103	umhos/cm
Soil ECEC	14	cmolc/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silt Loam - Silty Clay Loam	

### Estimated Base Saturation (%)

Total	Ca	Mg	K	Na
67.7	52.4	9.6	4.7	1.0

## 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop		N	P2O5	K2O	SO4S	Zn	B	Lime
		lb/acre						
Last Crop	Pasture (212)							
Crop 1	Mixed Cool and Warm-Season Grasses for Pasture (212)	60	0	0	0	0	0	4000
Crop 2								
Crop 3								

### 4. Crop 1 Notes:

To favor cool-season grasses, apply N in late winter. To favor warm-season grasses, do not apply N until May 1. For higher production, topdress 50 lb N/Acre after every 4-6 weeks of grazing or as needed.

### 5. Crop 2 Notes:

### 6. Crop 3 Notes:

# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity/affirmative action institution.

CHARLES BURDINE	Client ID:	8704345592
HC 72 BOX 70		
VENDER	AR	72683
Date Processed:	9/8/2010	
Field ID:	CB10	
Acres	32	
Lime Applied in the last 4 years:	No	
Labeled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	81767	
Sample Number:	1010824	

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich 3)
	ppm	lb/acre	
P	86	172	Above Optimum
K	152	304	Optimum
Ca	972	1944	--
Mg	113	226	--
SO4-S	20	40	--
Zn	5.3	10.6	--
Fa	180	360	--
Mn	123	246	--
Cu	1.4	2.8	--
B	0.0	0.0	--
NO3-N	27	54	--

## 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	5.5	--
Soil EC (1:2 soil-water)	103	umhos/cm
Soil ECEC	11	cmolc/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silt Loam	

### Estimated Base Saturation (%)

Total	Ca	Mg	K	Na
58.2	45.2	8.8	3.6	0.6

## 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop		N	P2O5	K2O	SO4S	Zn	B	Lime
		lb/acre						
Last Crop	Pasture (212)							
Crop 1	Mixed Cool and Warm-Season Grasses for Pasture (212)	60	0	40	0	0	0	4000
Crop 2								
Crop 3								

### 4. Crop 1 Notes:

To favor cool-season grasses, apply N in late winter. To favor warm-season grasses, do not apply N until May 1. For higher production, topdress 50 lb N/acre after every 4-6 weeks of grazing or as needed.

### 5. Crop 2 Notes:

### 6. Crop 3 Notes:

# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity affirmative action institution

CHARLES BURDINE	Client ID:	8704345592
HC 72 BOX 70		
VENDER	AR	72883
Date Processed:	9/8/2010	
Field ID:	CB11	
Acres	12	
Lime Applied in the last 4 years:	No	
Leveled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	81768	
Sample Number:	1010825	

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich's)
	ppm	lb/acre	
P	87	134	Above Optimum
K	180	320	Optimum
Ca	4279	8568	--
Mg	164	328	--
SO4-S	18	38	--
Zn	7.1	14.2	--
Fe	181	322	--
Mn	77	154	--
Cu	2.3	4.6	--
B	0.2	0.4	--
NO3-N	16	32	--

## 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	6.2	--
Soil EC (1:2 soil-water)	121	umhos/cm
Soil ECEC	27	cmolc/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Clay	

### Estimated Base Saturation (%)

Total	Ca	Mg	K	Na
86.9	80.0	5.1	1.5	0.3

## 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop	N	P2O5	K2O	SO4S	Zn	B	Lime
Last Crop	Pasture (203)						
Crop 1	60	0	0	0	0	0	0
Crop 2							
Crop 3							

### 4. Crop 1 Notes:

Apply the recommended rate of N, P, and K in late winter. For higher production apply an additional 50 lb N/Acre after every 4 to 6 weeks of grazing. For fall/winter grazing, apply 50 lbs N/Acre in late summer.

### 5. Crop 2 Notes:

### 6. Crop 3 Notes:

# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

*The University of Arkansas is an equal opportunity affirmative action institution*

CHARLES BURDINE HC 72 BOX 70 VENDER	Client ID: 8704345692 AR 72683
Date Processed:	9/8/2010
Field ID:	CB12
Acres	6
Lime Applied in the last 4 years:	No
Leveled in past 4 years:	No
Irrigation:	Unknown
County:	Newton
Lab Number:	81755
Sample Number:	1010628

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (McHCHC's)
	ppm	lb/acre	
P	75	150	Above Optimum
K	93	186	Medium
Ca	1697	3394	--
Mg	136	272	--
SO4-S	16	36	--
Zn	5.1	10.2	--
Fe	200	400	--
Mn	84	168	--
Cu	1.2	2.4	--
B	0.0	0.0	--
NO3-N	15	30	--

## 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	5.4	--
Soil EC (1:2 soil-water)	90	umhos/cm
Soil ECEC	16	cmolc/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silty Clay Loam - Clay Loam	

Estimated Base Saturation (%)				
Total	Ca	Mg	K	Na
62.4	53.2	7.1	1.5	0.5

## 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop		N	P2O5	K2O	SO4S	Zn	B	Lime
		lb/acre						
Last Crop	Pasture (203)							
Crop 1	Pasture - Cool-Season Grasses (MNT) (203)	60	0	50	0	0	0	6000
Crop 2								
Crop 3								

### 4. Crop 1 Notes:

Apply the recommended rate of N, P, and K in late winter. For higher production apply an additional 50 lb N/Acre after every 4 to 6 weeks of grazing. For fall/winter grazing, apply 50 lbs N/Acre in late summer.

### 5. Crop 2 Notes:

### 6. Crop 3 Notes:

# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uaik.edu/depts/soiltest>

The University of Arkansas is an equal opportunity/affirmative action institution

CHARLES BURDINE	Client ID:	8704345592
HC 72 BOX 70		
VENDER	AR	72683
Date Processed:	9/8/2010	
Field ID:	CB13	
Acres	11	
Lime Applied in the last 4 years:	No	
Leveled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	81756	
Sample Number:	1010627	

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich 3)
	ppm	lb/acre	
P	48	82	Optimum
K	59	118	Vary Low
Ca	868	1738	--
Mg	68	132	--
SO4-S	18	32	--
Zn	3.4	6.8	--
Fe	203	406	--
Mn	78	152	--
Cu	1.0	2.0	--
B	0.0	0.0	--
NO3-N	1	2	--

## 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	5.4	--
Soil EC (1:2 soil-water)	33	umhos/cm
Soil ECEC	10	cmolc/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silt Loam	

### Estimated Base Saturation (%)

Total	Ca	Mg	K	Na
53.1	45.3	5.7	1.6	0.5

## 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop	N	P2O5	K2O	SO4S	Zn	B	Lime
Last Crop	Pasture (212)						
Crop 1	60	30	160	0	0	0	5000
Crop 2							
Crop 3							

### 4. Crop 1 Notes:

To favor cool-season grasses, apply N in late winter. To favor warm-season grasses, do not apply N until May 1. For higher production, topdress 50 lb N/Acre after every 4-6 weeks of grazing or as needed.

### 5. Crop 2 Notes:

### 6. Crop 3 Notes:



# UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity/affirmative action institution

RICHARD CAMPBELL	Client ID:	8704345974
PO BOX 45		
VENDER	AR	72683
Date Processed:	1/27/2011	
Field ID:	VIV 1	
Acres	40	
Lime Applied in the last 4 years:	No	
Leveled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	32675	
Sample Number:	1010758	

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich 3)
	ppm	lb/acre	
P	24	48	Low
K	48	96	Very Low
Ca	433	866	--
Mg	28	56	--
SO4-S	13	26	--
Zn	0.8	1.6	--
Fe	159	318	--
Mn	53	106	--
Cu	0.3	0.6	--
B	0.2	0.4	--
NO3-N	8	16	--

## 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	5.6	--
Soil EC (1:2 soil-water)	24	umhos/cm
Soil ECEC	7	cmole/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Sandy Loam	

Estimated Base Saturation (%)				
Total	Ca	Mg	K	Na
39.2	32.9	3.5	1.9	0.9

## 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop		N	P2O5	K2O	SO4S	Zn	B	Lime
Last Crop	Pasture (203)							
Crop 1	Pasture - Cool-Season Grasses (MNT) (203)	60	70	120	0	0	0	3000
Crop 2								
Crop 3								

### 4. Crop 1 Notes:

Apply the recommended rate of N, P, and K in late winter. For higher production apply an additional 50 lb N/Acre after every 4 to 8 weeks of grazing. For fall/winter grazing, apply 50 lbs N/Acre in late summer.

### 5. Crop 2 Notes:

### 6. Crop 3 Notes:

# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity/affirmative action institution

RICHARD CAMPBELL	Client ID:	8704345974
PO BOX 45		
VENDER	AR	72683
Date Processed:	1/27/2011	
Field ID:	GD 1	
Acres	10	
Lime Applied in the last 4 years:	No	
Leveled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	32676	
Sample Number:	1010759	

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mahlich's)
	ppm	lb/acre	
P	18	36	Low
K	149	298	Optimum
Ca	595	1190	--
Mg	145	290	--
SO4-S	16	32	--
Zn	1.5	3.0	--
Fe	97	194	--
Mn	393	786	--
Cu	0.5	1.0	--
B	0.3	0.6	--
NO3-N	14	28	--

## 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	6.0	--
Soil EC (1:2 soil-water)	42	umhos/cm
Soil ECEC	8	cmolc/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silt Loam	

### Estimated Base Saturation (%)

Total	Ca	Mg	K	Na
60.8	38.9	15.8	5.0	1.0

## 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop	N	P2O5	K2O	SO4S	Zn	B	Lime
Last Crop	Pasture (203)						
Crop 1	60	70	0	0	0	0	0
Crop 2							
Crop 3							

### 4. Crop 1 Notes:

Apply the recommended rate of N, P, and K in late winter. For higher production apply an additional 50 lb N/Acre after every 4 to 6 weeks of grazing. For fall/winter grazing, apply 50 lbs N/Acre in late summer.

### 5. Crop 2 Notes:

### 6. Crop 3 Notes:

# U of A UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service  
Soil Analysis Report  
Soil Testing And Research Laboratory  
Marianna, AR 72360  
<http://www.uark.edu/depts/soiltest>

The University of Arkansas is an equal opportunity affirmative action institution.

MARVIN ED MILLS	Client ID:	8704285334
HC 31 BOX 147		
JASPER	AR	72641
Date Processed:	2/1/2011	
Field ID:	P	
Acres	40	
Lime Applied in the last 4 years:	No	
Leveled in past 4 years:	No	
Irrigation:	Unknown	
County:	Newton	
Lab Number:	36185	
Sample Number:	1010924	

## 1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich 3)
	PPM	lb/acre	
P	7	14	Very Low
K	117	234	Medium
Ca	815	1630	--
Mg	214	428	--
SO4-S	12	24	--
Zn	2.6	5.6	--
Fe	106	212	--
Mn	304	608	--
Cu	0.5	1.0	--
B	0.0	0.0	--
NO3-N	81	162	--

## 2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	4.8	--
Soil EC (1:2 soil-water)	114	umhos/cm
Soil ECEC	13	cmole/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silt Loam	

### Estimated Base Saturation (%)

Total	Ca	Mg	K	Na
48.9	32.0	14.0	2.4	0.6

## 3. Recommendations (Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop	Crop	N	P2O5	K2O	SO4S	Zn	B	Lime
Last Crop	General Garden (301)							
Crop 1	General Garden (Garden with no Legumes) (301)	1	1	1	0	0.25	0	92
Crop 2	Mixed Cool and Warm-Season Grasses for Pasture (212)	60	120	60	0	0	0	6000
Crop 3								

### 4. Crop 1 Notes:

Apply lime as far in advance of planting as possible.

Apply 8 lb of 13-13-13/1000 square ft or, a fertilizer with a ratio close to 1:1:1 before planting. At flowering, if needed to stimulate growth, apply 1.5 lb ammonium nitrate or 1 lb urea/1000 square ft and water thoroughly.  
Apply 1 lb granulated zinc sulfate/1000 square ft before planting.

### 5. Crop 2 Notes:

To favor cool-season grasses, apply N in late winter. To favor warm-season grasses, do not apply N until May 1. For higher production, topdress 50 lb N/Acre after every 4-8 weeks of grazing or as needed.

### 6. Crop 3 Notes:

AGRICULTURAL DIAGNOSTIC LABORATORY  
UNIVERSITY OF ARKANSAS - FAYETTEVILLE  
LIQUID MANURE FOR FERTILIZER ANALYSIS (report for AGRI-429)

Name: <u>C &amp; C FARMS</u>	Received in lab: <u>8/04/2010</u>
Address: <u>P.O. BOX 45</u>	Mailed: <u>7/07/2010</u>
City: <u>VENDER</u>	State, Zip: <u>AR 72683</u>
County: <u>NEWTON</u>	Check #: <u>0217 partial payment</u>

Lab. No.	<u>M100841</u>	<u>M100842</u>				
Sample I.D.	<u>6-11-V 1</u>	<u>Salids 2</u>				
ID, continued	<u>swine</u>	<u>swine</u>				
	<u>none given</u>	<u>none given</u>				
Bedding type	<u>none</u>	<u>none</u>				
Manure type	<u>pond liquid</u>	<u>pond sludge</u>				
Sample date	<u>8/02/2010</u>	<u>8/02/2010</u>				
Age of manure	<u>none given</u>	<u>none given</u>				
pH	<u>8.0</u>	<u>7.2</u>				
EC(umhos/cm)	<u>8250</u>	<u>9150</u>				
% Solids	<u>0.39</u>	<u>3.02</u>				

	-mg/l on as-is basis-					
Total N	<u>794</u>	<u>1720</u>				
Total P	<u>102</u>	<u>801</u>				
Total K	<u>887</u>	<u>1181</u>				
Total Ca	<u>36</u>	<u>980</u>				
NH4-N	<u>762</u>	<u>967</u>				
NO3-N						
Water Extractable P	<u>81</u>	<u>239</u>				

	-lbs/1000 gal on as-is basis-					
Total N	<u>6.6</u>	<u>14.3</u>				
TOTAL P AS						
"P2O5"	<u>1.9</u>	<u>15.3</u>				
TOTAL K AS						
"K2O"	<u>8.9</u>	<u>11.8</u>				
Total Ca	<u>0.3</u>	<u>8.2</u>				
NH4-N	<u>6.3</u>	<u>8.2</u>				
NO3-N						

Water Extractable P 0.7 2.0

\*lbs/1000gal P2O5 = mg/l Total P on "as-is" basis multiplied by 2.29\*0.00833

\*lbs/1000gal K2O = mg/l Total K on "as-is" basis multiplied by 1.2\*0.00833

\*Water Extractable P: 1:100 solids to H2O ratio, 1 hr shake, centrifuged, acidified, analysis by ICP

**Water Budget: (1,000 cu.ft.)**

<b>Month</b>	<b>Runoff</b>	<b>Withdrawal or Pumpdown</b>	<b>Waste Volume (1,000 cu.ft.)</b>	<b>Precipitation less Evaporation (1,000 cu.ft.)</b>	<b>Cumulative Storage Volume (1,000 cu.ft.)</b>
January	0		2.43	0.84	7.27
February	0		2.27	1.10	10.64
March	0	Yes	2.43	1.67	14.74
April	0		2.35	1.14	3.49
May	0		2.43	1.43	7.35
June	0		2.35	0.56	10.25
July	0	Yes	2.43	0.24	12.92
August	0		2.43	0.22	2.65
September	0		2.35	1.31	6.30
October	0		2.43	1.05	9.79
November	0	Yes	2.35	1.57	13.71
December	0		2.43	1.57	4.00

## SECTION 6 – MANURE SAMPLING

### Collecting Samples

When collecting a manure sample from the settling basin or holding ponds, the most important thing to keep in mind is to collect a sample representative of what will be land applied to the crop. The settling basin 1, settling basin 2, and the holding pond should be sampled separately, and records should be maintained for each storage structure.

### Settling Basins and Holding Pond

The settling basins and holding pond should be sampled immediately before or during land application. The sample should be as close as possible to the condition of the structures during land application.

If the structures are agitated and well mixed prior to application, one sample should be representative of the entire volume.

If the basins/pond are not agitated and well mixed prior to application, then three samples should be collected for each structure. In this case a sample should be collected at the beginning, middle and end of the application. Samples should be taken directly from the structure, the outlet line on a pump, or from the application equipment.

In either situation, a one-pint sample should be taken and sent to the lab in a well-sealed container. A wide mouthed plastic bottle works well.

### Sample Transfer

The sample should be mailed or taken to the lab on the day of collection to reduce sample degradation with time. Do not send samples that will not be delivered within one or two business days. The sample should be analyzed for total nitrogen, ammonical nitrogen, phosphorus, potassium and total solids. Contact the lab prior to sending a sample to receive all needed paperwork to submit with the sample.

## SECTION 6 – APPLICATION EQUIPMENT CALIBRATION

### Appendix 13A

### Calibrating Manure Spreading

The use of animal manure as a cropland fertilizer is economically and environmentally important. However, farmers cannot simply spread manure. They must know the nutrient quality of the manure and control the quantity and uniformity of the manure spread to ensure that the entire crop receives the nutrients.

The nutrient content of the manure is estimated from laboratory tests, and the quantity to apply is determined through computations of crop need. Farmers can receive this information from their county Extension office or other nutrient management planners. In practice, farmers often do not know exactly how much or how uniformly manure has been applied. Manure spreader calibration provides this important information.

Manure spreaders can discharge manure at varying rates, depending on forward travel speed, PTO speed, gear box settings, discharge opening, width of spread, overlap patterns, and other parameters. Calibration defines the combination of settings and travel speed needed to apply manure at a desired rate. Following is a description of the measurement methods used to determine manure application rates and ensure uniform application.

#### Calibration techniques

Calibration requires the measurement of the quantity of manure applied to the soil under different conditions. There are two calibration techniques: the *load-area* method, which involves measuring the amount of manure in a loaded spreader and then calculating the number of spreader loads required to cover a known land area; and the *weight-area* method, which requires weighing manure spread over a small surface and computing the quantity of manure applied per acre.

The calibration method to use depends on the type of manure spreader. Soil-injection, liquid manure spreaders must be calibrated using the load-area method because soil-injected manure cannot be collected. Liquid manure surface applied through a tank spreader is also best measured by the load-area method because of the difficulty in collecting the liquid manure, but it can be measured with the weight-area method. Solid and semisolid manure also can be measured with either method.

#### Load-area calibration

Load-area calibration requires measuring the quantity of manure (tons or gallons) held in a spreader load; spreading a number of identical loads at a constant speed, spreader setting and overlap; measuring the total area of the spread; and computing the quantity of manure applied per acre. After completing the following steps, record the calculations on Worksheet 1, Manure Spreader Capacity and Worksheet 2, Load-Area Calibration.

**Step 1. Determine the capacity of the manure spreader.** The capacity of the manure spreader must be expressed in units compatible with the units used for the nutrient analysis and recommended application rate. In some cases, the manufacturer provides the appropriate information; in other instances, the manufacturer's information must be converted.

**Liquid manure.** Liquid manure analysis is expressed in pounds of nutrient per gallon and the application rate is provided in gallons per acre; therefore, use gallons to express the capacity of a liquid manure spreader. Manufacturers specify liquid manure spreaders by gallons of volumetric capacity. This information can be found in the owner's manual.

**Solid and semisolid manure.** Solid and semisolid manure analysis is expressed in pounds of nutrient per ton and the application rate is provided in tons per acre; therefore, solid and semisolid manure spreader capacity must be expressed in tons of manure.

Solid and semisolid manures of different moisture content have different weights; thus, the weight capacity of the spreader changes according to the kind of manure held. The most direct and accurate method of determining the weight of a load of manure is to actually weigh the spreader load on farm scales. If scales are not available, use the procedure in the next section to convert the volumetric capacity of the spreader to weight capacity for the particular manure held. Record your calculations on Worksheet 1, Manure Spreader Capacity.

**Converting volumetric capacity to weight capacity.** The volumetric capacity of box-type and open-tank or barrel spreaders for solid and semisolid manure is expressed in cubic feet. The manufacturer provides this information in the owner's manual. Two capacities

are usually provided: heaped load (manure piled higher than the sides of the box) and struck load (the volume contained within the box). The capacity of older spreaders is sometimes designated in bushels; multiply the bushel capacity by 1.24 to determine capacity in cubic feet.

Multiply the volumetric capacity in cubic feet by the bulk density of the manure (in pounds per cubic foot) and convert it to tons. Bulk density depends on the amount of water, solids and air in the manure and can be measured by weighing a known standard volume of manure. A 5-gallon bucket has a volume of 2/3 cubic foot and can be used as a standard volume as follows:

1. Weigh the empty bucket and write the weight on the side of the bucket. This establishes the bucket's tare weight (the container weight subtracted from the gross weight to determine the weight of the manure).
2. Fill the bucket with manure from the loaded spreader. Use all the space in the bucket and pack the manure to the same density as in the spreader.
3. Weigh the full bucket and subtract the tare weight. The result is the manure weight in pounds.
4. Multiply the manure weight by 3 and then divide the product by 2. This gives the manure bulk density in pounds per cubic foot of volume.
5. Multiply the manure bulk density (in pounds per cubic foot) by the spreader capacity (in cubic feet) to get the weight of the spreader load in pounds. Divide by 2,000 to get tons.
6. Repeat this procedure at least three times. Sample the manure at different places and in different spreader loads. Average the values to obtain a representative composite of the manure.

**Step 2. Spread manure on a selected field.** Spread at least three full loads of manure on a field. Maintain the same speed and spreader setting for each load. Choose spreader path spacing to achieve what appears to be the most uniform coverage. Try to spread in a rectangle or square for easy calculation.

**Step 3. Measure the area of the spread.** Place flags at the corners of the spread area. Measure the width and length between the flags in feet using a measuring tape, measuring wheel, or consistent pace. Multiply the length by the width and divide that product by 43,560 to determine the area in acres.

**Step 4. Compute the application rate.** Multiply the number of loads spread by the number of tons or gallons per load to determine the total amount of manure applied to the area. Divide the total amount of manure by the area of the spread in acres to determine the application rate in tons per acre or gallons per acre.

The load-area method should be repeated at different speeds and spreader settings until the desired application rate is obtained. Maintain a record of the application rates at different settings to avoid recalibrating the spreader each season.

### Weight-area calibration

Spreader calibration by weight-area requires laying out a ground sheet of known dimensions on the soil; spreading manure over it at a selected speed, spreader setting and overlap; retrieving the ground sheet and the manure deposited on it; weighing the manure retrieved; and computing the quantity of manure applied per acre. The weight-area method does not require measuring the amount of manure in the spreader. As you complete the following steps, record your calculations on Worksheet 3, Weight-Area Calibration.

**Step 1. Select a manure collection surface.** A ground sheet can be a cloth or plastic (6 mil) sheet of at least 100 square feet (10 feet by 10 feet) in area. Multiply the length of the sheet by the width to determine its area in square feet.

Liquid manure may run off a flat ground sheet; shallow plastic or metal pans are more useful. The pans should have a minimum area of 1 square foot each. Multiply the length of one pan by its width to determine the area of one pan. Multiply the area of one pan by the number of pans used to determine the total collection area in square feet. For handling and cleaning convenience, place the pan inside a plastic garbage bag for each field test so that the bag and manure can be discarded leaving the pan clean. Six or more pans are necessary for a test.



Weigh the ground sheet or pan and record the weights for use as a tare weight in calculations. Dirty sheets and pans can be used for multiple tests only after major manure deposits have been removed. Dirty sheets and pans must be weighed before each test so that any manure residue is included in the new tare weight.

**Step 2. Secure the collection surface in the field.** Lay the ground sheet out fully extended. Lay the sheet on the ground so that as the sheet is removed from the field the manure applied over the surface can be collected easily in its folds. If dirty sheets are being used for additional tests turn the dirty side up so that any manure residue included in the tare weight is not lost. Weights of stone metal or earth clods will be required to hold the ground sheet on the soil surface. A small breeze can easily fold the sheet or tractor wheels and forceful applications of manure can move it.

Pans are not as easily affected by wind, but may be moved by forceful streams from side outlet manure spreaders. Evenly space pans in a row perpendicular to the spreader's path. Pans are easily crushed by tires; allow for wheel tracks and adhere to the path provided. Placing flags at designated wheel tracks helps avoid pan damage.

**Step 3. Spread manure over the collection area.** Spread manure over and near the ground sheet or pans in a manner that best duplicates the spreading pattern you plan for the field. With rear outlet spreaders, make three passes: the first pass directly over the center of the collection area and the remaining two passes on the opposite sides of the first pass with an overlap. With side outlet spreaders, locate a first pass off of, but along one edge of, the collection area. Follow with subsequent passes farther away from the collection area and at the intended overlap until manure no longer reaches the surface.

In all cases, start spreading manure far enough before the collection area to ensure that the spreader is functioning. If a ground sheet is folded or a pan is moved during a spread pass, investigate its condition before continuing with the test. Folded edges can be straightened without major loss of accuracy. If more than one-fourth of the surface has moved and did not receive manure, the test should be conducted again with a newly weighed sheet. Pans that have been crushed but retain the applied manure can still be used. Return moved pans to their original position.

**Step 4. Collect and weigh the manure.** Remove weights used to hold the ground sheet in place. Fold the ground sheet and manure in short sections from all sides and corners inward to avoid losing any manure. A 10-foot by 10-foot sheet folded with wet manure may weigh as much as 150 pounds and tends to slip around when carried; place it in a feed tub or other container for easier handling.

Pans are easy to handle and will usually weigh less than 4 pounds each. Careful handling is required to avoid spilling liquid manure.

Select scales capable of accurately weighing the type and quantity of manure collected. A single pan may collect from 2 ounces to 4 pounds and can be weighed with a kitchen scale. A ground sheet may collect from 10 to 50 pounds with application rates of less than 10 tons per acre. A ground sheet can be weighed with spring-tension or milk scales. A ground sheet with application rates greater than 10 tons per acre will require a platform balance with a capacity of 50 to 150 pounds or greater.

The weight indicated on the scale will include the tare weight of the ground sheet or pan as well as that of any container used to hold the ground sheet or pan during weighing. Subtract the tare weights from the total weight to determine the net weight of the manure collected.

**Step 5. Compute the application rate.** The number of steps and the procedure used to compute the application rate depend on the method of collection and the units per acre.

**Ground sheet to tons per acre.** Divide the net pounds of manure collected by the area of the ground sheet to obtain the manure application rate in pounds of manure per square foot. Multiply the result by 43,560 and then divide by 2,000 to convert to tons per acre.

**Pans to tons per acre.** Add the net weights of manure collected in individual pans to determine the total weight of manure collected. Divide the total manure weight by the total collection area to obtain pounds of manure per square foot. Multiply the result by 43,560 and divide by 2000 to obtain tons per acre.

**Pans to gallons per acre.** If working with weight from pans to determine liquid applications in gallons per acre, make an additional measurement to calculate the weight per gallon of manure. Fill a 5-gallon bucket with liquid manure of the same consistency of that applied. Weigh the bucket of manure and subtract the tare weight of the bucket to determine the net weight of 5 gallons of manure. Divide the result by 5 to determine the weight in pounds per gallon. Follow the procedure for "Pans to tons per acre" through obtaining pounds of manure per square foot. Then multiply by 43,560 and divide by pounds per gallon to obtain gallons per acre.

### Uniformity testing

The results of nonuniform manure spreading are often indicated by the lush, green growth within the spreader paths and the not-so-lush growth between spreader paths. This occurs because more manure was deposited in and near the spreader path than farther away from the path. Uniform application can be obtained by adjusting the application overlap. The amount of overlap necessary can be determined by a uniformity test. As you complete the steps in this uniformity test, record your calculations on Worksheet 4, Uniformity Testing.

The test procedure is identical to the weight-area calibration method, using pans or a series of 24-inch by 24-inch ground sheet sheets laid out with equal spacing across two spreader path widths. After the manure is applied, each pan or sheet is compared with the others. Uniformity can be recorded when manure is spread to determine the application rate.

If all containers collect about the same amount of manure during a test, the application is uniform; if some collect more than others, the overlap should be adjusted. High application in the center of paths and low application between paths indicate a need to increase the overlap by decreasing the path spacing. Higher application between paths than within paths indicates a need to decrease overlap by increasing path spacing.

### Shortcuts

Developing a range of application rates for different manure spreader speeds can be simplified if the spreader is PTO-powered and the tractor or truck is equipped with a groundspeed indicator. Conduct one test at low groundspeed and one at high groundspeed, maintaining the same spreader setting and PTO speed for both tests. Plot these two application rates on a graph of groundspeed versus application and draw a straight line connecting the two points. The application rate available at intermediate groundspeeds can then be estimated from the graph. Conducting additional high-low tests at different settings or at different PTO speeds will define a full range of available application rates.

If solid or semisolid manure changes moisture content from season to season, the weight capacity in the spreader and the application rate by weight will change. Adjust previously calibrated spreader conditions for these changes by determining the bulk density of the new manure. To estimate the field application rate for the new manure for a particular speed and spreader setting, multiply the old application rate by the new bulk density and then divide by the old bulk density. This calculation eliminates the need to repeat the field test every time manure properties change.

### Summary

By measuring the application rate and uniformity of manure spreading, a farmer can be sure of the amount of manure nutrients applied to a crop. This measurement, called calibration, can be accomplished with a little time and a few dollars. For further information, contact your county Extension office.

*Source—Adapted from Calibrating Manure Spreaders, Fact Sheet 419, Cooperative Extension Service, University of Maryland System, H.L. Brodke, extension agricultural engineer, and G.L. Smith, extension agricultural engineer, Department of Agricultural Engineering, University of Maryland at College Park, Published 1985-86, revised 1990-91.*

**Worksheet 13A-1—Manure Spreader Capacity****A. Description of spreader.**

Manufacturer \_\_\_\_\_ Model \_\_\_\_\_

Type:  box  open-tank  liquid-tank

Capacity: This information is available from your dealer or owner's manual.

Older models: bushels x 1.24 = cubic feet

Box or open-tank: \_\_\_\_\_ ft<sup>3</sup> struck load \_\_\_\_\_ ft<sup>3</sup> heaped load

Liquid-tank: \_\_\_\_\_ gal

**B. For open-tank and box spreaders, determine the pounds per cubic foot of manure and the weight capacity of the spreader.**Type of manure:  solid  semisolid**1. Determine manure density using a 5-gallon bucket.**

	Trial 1	Trial 2	Trial 3	
a. Empty bucket weight or tare weight	_____	_____	_____	lb
b. Bucket filled with manure	_____	_____	_____	lb
c. Net weight of manure (b - a)	_____	_____	_____	lb
d. Manure density [(c x 3) ÷ 2]	_____	_____	_____	lb/ft <sup>3</sup>
e. Average of three trials	_____ lb/ft <sup>3</sup>			

**2. Weight capacity of the spreader.**

	Struck load	Heaped load
Spreader capacity	_____ ft <sup>3</sup>	_____ ft <sup>3</sup>
x	x	x
Manure density	_____ lb/ft <sup>3</sup>	_____ lb/ft <sup>3</sup>
=	=	=
Load weight	_____ lb	_____ lb
+	+	+
2,000	_____ tons	_____ tons

**Worksheet 13A-2—Load-Area Calibration****Liquid-Tank Spreaders (Liquid Manure)**

1. Determine the capacity of the manure spreader. \_\_\_\_\_ gal
2. Spread at least three full loads at the desired speed, spreader setting and overlap.
3. Measure the area of the spread.
  - a. Spread manure area width \_\_\_\_\_ ft
  - b. Spread manure area length \_\_\_\_\_ ft
  - c. Spread area (a x b) \_\_\_\_\_ ft<sup>2</sup>
  - d. Spread area in acres (c ÷ 43,560) \_\_\_\_\_ acres
4. Compute the application rate.
  - e. Number of loads spread \_\_\_\_\_
  - f. Capacity per load \_\_\_\_\_ gal
  - g. Total manure spread (e x f) \_\_\_\_\_ gal
  - h. Application rate (g ÷ d) \_\_\_\_\_ gal/acre

**Box and Open-Tank Spreaders (Solid and Semisolid Manure)**

1. Determine the capacity of the manure spreader. \_\_\_\_\_ tons
2. Spread at least three full loads at the desired speed, spreader setting and overlap.
3. Measure the area of the spread.
  - a. Spread manure area width \_\_\_\_\_ ft
  - b. Spread manure area length \_\_\_\_\_ ft
  - c. Spread area (a x b) \_\_\_\_\_ ft<sup>2</sup>
  - d. Spread area in acres (c ÷ 43,560) \_\_\_\_\_ acres
4. Compute the application rate.
  - e. Number of loads spread \_\_\_\_\_
  - f. Capacity per load \_\_\_\_\_ tons
  - g. Total manure spread (e x f) \_\_\_\_\_ tons
  - h. Application rate (g ÷ d) \_\_\_\_\_ tons/acre

Nutrient application = tons/acre x pounds of nutrient per ton  
or gallons/acre x pounds of nutrient per gallon

**Worksheet 13A-3—Weight-Area Calibration**

## 1. Select a manure collection surface.

## a. Determine collection area

Ground sheet:

width \_\_\_\_\_ ft x length \_\_\_\_\_ ft = area \_\_\_\_\_ ft<sup>2</sup>

Pans:

pan width \_\_\_\_\_ inch x pan length \_\_\_\_\_ inch ÷ 144 = pan area \_\_\_\_\_ ft<sup>2</sup>pan area \_\_\_\_\_ x number of pans \_\_\_\_\_ = collection area \_\_\_\_\_ ft<sup>2</sup>

## 2. Secure ground sheet or pans.

## 3. Spread manure over the collection area.

	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
Forward speed, gear or throttle setting	_____	_____	_____	_____	_____
PTO speed	_____	_____	_____	_____	_____
Spreader setting	_____	_____	_____	_____	_____

## 4. Collect and weigh the manure and compute the application rate.

a. Tare weight of sheet or pan and weighing container	_____	_____	_____	_____	_____ lb
b. Gross weight of sheet or pan, collected manure and weighing container	_____	_____	_____	_____	_____ lb
c. Net weight of manure (b - a)	_____	_____	_____	_____	_____ lb
d. Area of sheet or pans	_____	_____	_____	_____	_____ ft <sup>2</sup>
e. Application rate (c ÷ d)	_____	_____	_____	_____	_____ lb/ft <sup>2</sup>

Ground sheet or pans to tons per acre.

f. Application rate [(c × 43,560) ÷ 2,000]	_____	_____	_____	_____	_____ ton/ac
--	-------	-------	-------	-------	--------------

Pans to gallons per acre.

g. Tare weight of a 5-gallon bucket	_____	_____	_____	_____	_____ lb
h. Weight of a 5-gallon bucket full of manure	_____	_____	_____	_____	_____ lb
i. Net weight of 1 gallon of manure [(h - g) ÷ 5]	_____	_____	_____	_____	_____ lb/gal
j. Application rate [(e × 43,560) ÷ g]	_____	_____	_____	_____	_____ gal/ac

Nutrient application = tons/acre x pounds of nutrient per ton  
or gallons/acre x pounds of nutrient per gallon.

**Worksheet 13A-4—Uniformity Testing**

1. Layout a line of small ground sheet sheets or pans of equal size, equally spaced across two spreader path widths

- a. Determine the pan or sheet area.

width \_\_\_\_\_ Inch x length \_\_\_\_\_ Inch + 144 = area \_\_\_\_\_ ft<sup>2</sup>

2. Spread manure over the collection area.

Forward speed, gear or  
throttle setting \_\_\_\_\_

PTO speed \_\_\_\_\_

Spreader setting \_\_\_\_\_

	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Area 7	
a. Tare weight of sheet or pan and weighing container	_____	_____	_____	_____	_____	_____	_____	lb
b. Gross weight of sheet or pan, collected manure and weighing container	_____	_____	_____	_____	_____	_____	_____	lb
c. Net weight of manure (b - a)	_____	_____	_____	_____	_____	_____	_____	lb
d. Area of sheet or pans	_____	_____	_____	_____	_____	_____	_____	ft <sup>2</sup>
e. Application rate (c ÷ d)	_____	_____	_____	_____	_____	_____	_____	lb/ft <sup>2</sup>

Uniformity is achieved when all pans or sheets collect the same amount of manure. To improve uniformity, adjust spreader paths to increase or decrease overlap.

Published 1985-80  
Revised 1990-91

## SECTION 6 – DETERMINING EFFLUENT APPLICATION RATE

**Maximum Hourly Application Rate** – The maximum hourly application rate is determined by the texture of the soil layer with the lowest permeability within the upper 24 inches of the predominant soil in each field. *The hourly application rate must be low enough to avoid runoff and/or ponding.* The following table shows the estimated permeability rates for the predominant soil type in each field.

Field	Predominant Soil Type	Average Permeability in the upper 24 inches (inches/hour)	Minimum Application Time based on recommended application rate (minutes/acre)
CCGW	Linker-Mountainburg complex	0.6 – 2.0	29
CC1	Nella-Steprock complex	0.6 – 2.0	15
JG-A	Linker-Mountainburg complex	0.6 – 2.0	19
JG-B	Linker-Mountainburg complex	0.6 – 2.0	19
EC-A	Linker loam	0.6 – 2.0	19
EC-B	Nella-Enders stony loam	0.6 – 2.0	19
DC	Linker-Mountainburg complex	0.6 – 2.0	19
HB1	Enders-Leesburg stony loam	0.6 – 2.0	19
HB2	Enders-Leesburg stony loam	0.6 – 2.0	19
HB3	Nella-Enders stony loam	0.6 – 2.0	19
LCM1	Enders stony loam	0.6 – 2.0	19
LCM2	Nella-Enders stony loam	0.6 – 2.0	19
LCM3	Linker-Mountainburg complex	0.6 – 2.0	19
RM1	Noark very cherty silt loam	0.6 – 2.0	19
RM2	Spradra loam	0.6 – 2.0	19
MM1	Razort loam	0.6 – 2.0	19
MM2	Razort loam	0.6 – 2.0	19
MM3	Razort loam.	0.6 – 2.0	19
RC3	Razort loam	0.6 – 2.0	19
RC4	Noark very cherty silt loam	0.6 – 2.0	19
PC1	Nella-Enders stony loam	0.6 – 2.0	19
CB1	Noark very cherty silt loam	2.0 – 6.0	19
CB2	Noark very cherty silt loam	2.0 – 6.0	19
CB3	Noark very cherty silt loam	0.2 – 0.6	19
CB4	Razort loam	0.2 – 0.6	19
CB5	Razort loam	0.6 – 2.0	19
CB6	Razort loam	0.6 – 2.0	19
CB7	Noark very cherty silt loam	0.6 – 2.0	19
CB8	Enders stony loam	0.2 – 0.6	19
CB9	Nella-Enders stony loam	0.6 – 2.0	19
CB10	Noark very cherty silt loam	0.6 – 2.0	19
CB11	Eden-Newnata complex	2.0 – 6.0	19
CB12	Eden-Newnata complex	0.6 – 2.0	19
CB13	Nella-Enders stony loam	0.6 – 2.0	19
EM1	Nella-Enders stony loam	0.6 – 2.0	19
GD1	Nella-Enders stony loam	0.6 – 2.0	19

VIV1	Linker-Mountainburg complex	0.6 - 2.0	19
VIVA	Linker-Mountainburg complex	0.6 - 2.0	19

**Maximum One-time Application Rate** – The maximum amount of effluent that can be applied to a field at any one time is the amount that will bring the top 24 inches of the soil to its available water holding capacity, which is the amount of water that may be held in by the soil, against the forces of gravity. The available water holding capacity (AWC) of the upper 24 inches of the predominant soil type in each field should be used. *The AWC for each soil type will greatly exceed the recommended application amount based on the Phosphorus Index, and the recommended rate should be used.*

Field	Predominant Soil Type	Available Water Holding Capacity in Top 24 Inches of Soil (AWC) (inches)	Recommended Application Rate (inches/acre)
CCGW	Linker-Mountainburg complex	3.72	0.63
CC1	Nella-Steprock complex	2.76	0.33
JG-A	Linker-Mountainburg complex	3.72	0.41
JG-B	Linker-Mountainburg complex	3.72	0.41
EC-A	Linker loam	3.72	0.41
EC-B	Nella-Enders stony loam	2.76	0.41
DC	Linker-Mountainburg complex	3.72	0.41
HB1	Enders-Leesburg stony loam	3.60	0.41
HB2	Enders-Leesburg stony loam	3.60	0.41
HB3	Nella-Enders stony loam	2.76	0.41
LCM1	Enders stony loam	3.60	0.41
LCM2	Nella-Enders stony loam	3.72	0.41
LCM3	Linker-Mountainburg complex	3.72	0.41
RM1	Noark very cherty silt loam	2.64	0.41
RM2	Spradra loam	3.84	0.41
MM1	Razort loam	4.20	0.41
MM2	Razort loam	4.20	0.41
MM3	Razort loam	4.20	0.41
RC3	Razort loam	4.20	0.41
RC4	Noark very cherty silt loam	2.64	0.41
PC1	Nella-Enders stony loam	2.76	0.41
CB1	Noark very cherty silt loam	2.64	0.41
CB2	Noark very cherty silt loam	2.64	0.41
CB3	Noark very cherty silt loam	2.64	0.41
CB4	Razort loam	4.20	0.41
CB5	Razort loam	4.20	0.41
CB6	Razort loam	4.20	0.41
CB7	Noark very cherty silt loam	2.64	0.41
CB8	Enders stony loam	3.60	0.41
CB9	Nella-Enders stony loam	2.76	0.41
CB10	Noark very cherty silt loam	2.64	0.41
CB11	Eden-Newnata complex	2.52	0.41
CB12	Eden-Newnata complex	2.52	0.41



CB13	Nella-Enders stony loam	2.76	0.41
EM1	Nella-Enders stony loam	2.76	0.41
GD2	Nella-Enders stony loam	2.76	0.41
VIV1	Linker-Mountainburg complex	3.72	0.41
VIV1A	Linker-Mountainburg complex	3.72	0.41

**Determining Existing Soil Moisture** – The following table shall be used to determine the existing soil AWC, prior to waste application, to prevent application in excess of the soil AWC. A soils probe or shovel will be required to test the upper 24 inches of soil.

<b>Available Moisture in the soil</b>	<b>Fine Sandy Loam</b>	<b>Silt Loam</b>
<b>0% Soil Moisture</b>	Dry and loose. Flows through fingers.	Powdery dry; in places slightly crusted but breaks down to powder easily.
<b>Soil Depth</b> <b>Amount to Reach AWC</b>	<u>0 – 24"</u> 1.2"	<u>0 – 24"</u> 3.6"
<b>50% or Less Soil Moisture</b>	Appears to be dry; does not form a ball under pressure.	Somewhat crumbly but holds together under pressure.
<b>Soil Depth</b> <b>Amount to Reach AWC</b>	<u>0 – 24"</u> 0.9"	<u>0 – 24"</u> 2.7"
<b>50% Soil Moisture</b>	Balls under pressure but seldom holds together.	Forms a ball under pressure; somewhat plastic; slicks slightly under pressure.
<b>Soil Depth</b> <b>Amount to Reach AWC</b>	<u>0 – 24"</u> 0.6"	<u>0 – 24"</u> 1.8"
<b>75% Soil Moisture</b>	Forms a weak ball that breaks easily, does not stick.	Forms ball; very pliable; sticks readily if relatively high in clay.
<b>Soil Depth</b> <b>Amount to Reach AWC</b>	<u>0 – 24"</u> 0.3"	<u>0 – 24"</u> 0.9"
<b>100% Soil Moisture</b>	On squeezing, no free water appears on soil, but wet outline of ball on hand.	On squeezing, no free water appears on soil, but wet outline of ball on hand.
<b>Soil Depth</b> <b>Amount to Reach AWC</b>	<u>0 – 24"</u> 0.0"	<u>0 – 24"</u> 0.0"
<b>Above Field Capacity</b>	Free water is released with kneading.	Free water can be squeezed out.

### Application Rates:

The amount of nutrients and manure applied on this farm and additional land application areas will be based on the soils tests and analysis of the liquids in the holding ponds. Any additional commercial fertilizer applied on this farm will be land applied according to the recommendation provided by the soil test. A phosphorus index assessment will be made to determine the controlling nutrient to be used to determine application quantities.

### Interpreting P Index Values:

<b>Range Class</b>	<b>Interpretation</b>
<b>Low (&lt;33)</b>	Low potential for P movement from site. Apply nutrients based on crop needs, normally nitrogen. However, if P is applied above crop needs, P build up will take place over time.
<b>Medium (33-66)</b>	Medium potential for P movement from site. Evaluate the index and determine any areas that could cause long-term concerns. Consider adding conservation practices or reduced P application to maintain the risk at 66 or less. Apply nutrients based on crop needs, normally nitrogen. If P is applied above crop requirements, soil P levels will accumulate over time.
<b>High (67-100)</b>	High potential for P movement from site. Evaluate the index and determine elevation cause. Add appropriate conservation practices and/or reduce soluble P application. The immediate planning target is a PI value of 66 or less. If this cannot be achieved with realistic conservation practices and/or reduced P rates in the short term, then a progressive plan needs to be developed with a long term goal of a PI less than 66. Apply nutrients to meet crop phosphorus needs according to NRCS Nutrient Management Standard (590).
<b>Very High (&gt;100)</b>	Very high potential for P movement from site. Add conservation practices to decrease this value below 1.8 in the short term and develop a progressive conservation plan that would reduce the PI to a lower risk category, with a long term goal of a PI of less than 66.

**Soil Test Recommendations and PI Index Results:**

Field	Soil Test Recommendations			PI Index	Apply to Meet
	N (lbs/ac)	P <sub>2</sub> O <sub>5</sub> (lbs/ac)	K <sub>2</sub> O (lbs/ac)		
CCGW	160	0	0	46	Soil Test Recommendations
CCI	160	0	180	65	Soil Test Recommendations
JG-A	160	0	120	48	Soil Test Recommendations
JG-B	160	0	120	61	Soil Test Recommendations
EC-A	160	0	120	39	Soil Test Recommendations
EC-B	160	0	120	39	Soil Test Recommendations
DC	160	0	80	39	Soil Test Recommendations
HB1	160	70	80	46	Soil Test Recommendations
HB2	160	70	50	45	Soil Test Recommendations
HB3	160	40	80	36	Soil Test Recommendations
LCM1	160	0	120	34	Soil Test Recommendations
LCM2	160	70	120	40	Soil Test Recommendations
LCM3	160	40	120	33	Soil Test Recommendations
RM1	160	100	0	28	Soil Test Recommendations
RM2	160	0	40	61	Soil Test Recommendations
MM1	160	0	80	65	Soil Test Recommendations
MM2	160	0	50	51	Soil Test Recommendations
MM3	160	0	50	55	Soil Test Recommendations
RC3	160	0	110	54	Soil Test Recommendations
RC4	160	40	0	31	Soil Test Recommendations
PC1	160	0	0	37	Soil Test Recommendations

Field	Soils Test/Recommendations			P Index	Apply to Meet
	N (lbs/ac)	P <sub>2</sub> O <sub>5</sub> (lbs/ac)	K <sub>2</sub> O (lbs/ac)		
CB1	160	0	100	39	Soil Test Recommendations
CB2	160	0	0	53	Soil Test Recommendations
CB3	160	0	0	53	Soil Test Recommendations
CB4	160	0	100	53	Soil Test Recommendations
CB5	160	0	40	54	Soil Test Recommendations
CB6	160	0	160	57	Soil Test Recommendations
CB7	160	0	0	57	Soil Test Recommendations
CB8	160	0	0	57	Soil Test Recommendations
CB9	160	0	0	48	Soil Test Recommendations
CB10	160	0	40	36	Soil Test Recommendations
CB11	160	0	0	52	Soil Test Recommendations
CB12	160	0	50	53	Soil Test Recommendations
CB13	160	30	160	48	Soil Test Recommendations
EM1	160	120	60	27	Soil Test Recommendations
GD1	160	70	0	31	Soil Test Recommendations
VIV1	160	70	120	36	Soil Test Recommendations
VIV1A	160	70	120	46	Soil Test Recommendations

**Planned Application Rates: Maximum Per year Allowed**

Field	Acres	Source	Time	Application Rate (1,000 gal/ac.)	Application Rate (inches/ac.)	Total Application (gallons)
CCGW	20.0	Holding Pond	Jan.-Dec.	17	0.63	340,000
CC1	5.2	Settling Basin	Jan.-Dec.	9	0.33	46,800
JG-A	14.0	Settling Basin	Jan.-Dec.	11	0.41	154,000
JG-B	3.0	Settling Basin	Jan.-Dec.	11	0.41	33,000
EC-A	4.8	Settling Basin	Jan.-Dec.	11	0.41	52,800
EC-B	9.7	Settling Basin	Jan.-Dec.	11	0.41	106,700
DC	15.7	Settling Basin	Jan.-Dec.	11	0.41	172,700
HB1	11.1	Settling Basin	Jan.-Dec.	11	0.41	122,100
HB2	19.7	Settling Basin	Jan.-Dec.	11	0.41	216,700
HB3	9.9	Settling Basin	Jan.-Dec.	11	0.41	108,900
LCM1	18.5	Settling Basin	Jan.-Dec.	11	0.41	203,500
LCM2	16.2	Settling Basin	Jan.-Dec.	11	0.41	178,200
LCM3	19.6	Settling Basin	Jan.-Dec.	11	0.41	215,600
RM1	82.2	Settling Basin	Jan.-Dec.	11	0.41	904,200
RM2	21.4	Settling Basin	Jan.-Dec.	11	0.41	235,400
MM1	3.1	Settling Basin	Jan.-Dec.	11	0.41	34,100
MM2	29.8	Settling Basin	Jan.-Dec.	11	0.41	327,800
MM3	10.9	Settling Basin	Jan.-Dec.	11	0.41	119,900
RC3	12.0	Settling Basin	Jan.-Dec.	11	0.41	132,000
RC4	18.4	Settling Basin	Jan.-Dec.	11	0.41	202,400

Field	Acres	Source	Time	Application Rate (1,000 gal/ac.)	Application Rate (inches/ac.)	Total Application (gallons)
PC1	18.3	Settling Basin	Jan.-Dec.	11	0.41	201,300
CB1	7.2	Settling Basin	Jan.-Dec.	11	0.41	79,200
CB2	33.9	Settling Basin	Jan.-Dec.	11	0.41	372,900
CB3	2.1	Settling Basin	Jan.-Dec.	11	0.41	23,100
CB4	16.1	Settling Basin	Jan.-Dec.	11	0.41	177,100
CB5	1.8	Settling Basin	Jan.-Dec.	11	0.41	19,800
CB6	13.3	Settling Basin	Jan.-Dec.	11	0.41	146,300
CB7	44.0	Settling Basin	Jan.-Dec.	11	0.41	484,000
CB8	6.5	Settling Basin	Jan.-Dec.	11	0.41	71,500
CB9	21.2	Settling Basin	Jan.-Dec.	11	0.41	233,200
CB10	30.2	Settling Basin	Jan.-Dec.	11	0.41	332,200
CB11	10.7	Settling Basin	Jan.-Dec.	11	0.41	117,700
CB12	4.5	Settling Basin	Jan.-Dec.	11	0.41	49,500
CB13	10.1	Settling Basin	Jan.-Dec.	11	0.41	111,100
EM1	6.6	Settling Basin	Jan.-Dec.	11	0.41	72,600
GD1	10.2	Settling Basin	Jan.-Dec.	11	0.41	112,200
VIV1	22.9	Settling Basin	Jan.-Dec.	11	0.41	251,900
VIV1A	13.3	Settling Basin	Jan.-Dec.	11	0.41	146,300

**Nutrient Balance:**

Field	Acres	Nutrients Applied (lbs/ac)			Surplus / Deficit (lbs/ac)		
		N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
CCGW	20.0	51	27	129	-109	27	129
CC1	5.2	129	138	106	-31	138	-74
JG-A	14.0	157	168	130	-3	168	10
JG-B	3.0	157	168	130	-3	168	10
EC-A	4.8	157	168	130	-3	168	10
EC-B	9.7	157	168	130	-3	168	10
DC	15.7	157	168	130	-3	168	10
HB1	11.1	157	168	130	-3	98	50
HB2	19.7	157	168	130	-3	98	50
HB3	9.9	157	168	130	-3	128	50
LCM1	18.5	157	168	130	-3	168	10
LCM2	16.2	157	168	130	-3	98	10
LCM3	19.6	157	168	130	-3	128	10
RM1	82.2	157	168	130	-3	68	130
RM2	21.4	157	168	130	-3	168	90
MM1	3.1	157	168	130	-3	168	50
MM2	29.8	157	168	130	-3	168	80
MM3	10.9	157	168	130	-3	168	80
RC3	12.0	157	168	130	-3	168	20
RC4	18.4	157	168	130	-3	128	130
PC1	18.3	157	168	130	-3	168	130
CB1	7.2	157	168	130	-3	168	30
CB2	33.9	157	168	130	-3	168	130
CB3	2.1	157	168	130	-3	168	130
CB4	16.1	157	168	130	-3	168	30
CB5	1.8	157	168	130	-3	168	90
CB6	13.3	157	168	130	-3	168	-30
CB7	44.0	157	168	130	-3	168	130
CB8	6.5	157	168	130	-3	168	130
CB9	21.2	157	168	130	-3	168	130
CB10	30.2	157	168	130	-3	168	90
CB11	10.7	157	168	130	-3	168	130
CB12	4.5	157	168	130	-3	168	80
CB13	10.1	157	168	130	-3	138	-30
EM1	6.6	157	168	130	-3	48	70
GD1	10.2	157	168	130	-3	98	130
VIV1	22.9	157	168	130	-3	98	10
VIV1A	13.3	157	168	130	-3	98	10

**Supplemental Fertilizer Needs:**

Field	Acres	Supplemental Nutrients (lbs/ac)			Supplemental Nutrients (lbs)		
		N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
CCGW	20.0	109	0	0	2,180	0	0
CC1	5.2	31	0	74	1,61	0	384
JG-A	14.0	3	0	0	42	0	0
JG-B	3.0	3	0	0	9	0	0
EC-A	4.8	3	0	0	14	0	0
EC-B	9.7	3	0	0	29	0	0
DC	15.7	3	0	0	47	0	0
HB1	11.1	3	0	0	33	0	0
HB2	19.7	3	0	0	59	0	0
HB3	9.9	3	0	0	29	0	0
LCM1	18.5	3	0	0	55	0	0
LCM2	16.2	3	0	0	48	0	0
LCM3	19.6	3	0	0	58	0	0
RM1	82.2	3	0	0	246	0	0
RM2	21.4	3	0	0	64	0	0
MM1	3.1	3	0	0	9	0	0
MM2	29.8	3	0	0	89	0	0
MM3	10.9	3	0	0	32	0	0
RC3	12.0	3	0	0	36	0	0
RC4	18.4	3	0	0	55	0	0
PC1	18.3	3	0	0	54	0	0
CB1	7.2	3	0	0	21	0	0
CB2	33.9	3	0	0	101	0	0
CB3	2.1	3	0	0	6	0	0
CB4	16.1	3	0	0	48	0	0
CB5	1.8	3	0	0	5	0	0
CB6	13.3	3	0	30	39	0	399
CB7	44.0	3	0	0	132	0	0
CB8	6.5	3	0	0	19	0	0
CB9	21.2	3	0	0	63	0	0
CB10	30.2	3	0	0	90	0	0
CB11	10.7	3	0	0	32	0	0
CB12	4.5	3	0	0	13	0	0
CB13	10.1	3	0	30	30	0	303
EM1	6.6	3	0	0	19	0	0
GD1	10.2	3	0	0	30	0	0
VIV1	22.9	3	0	0	68	0	0
VIV1A	13.3	3	0	0	39	0	0



## Section 7 FEED MANAGEMENT

Nutrient Management Tech. Note No. 3



## SECTION 7 – FEED MANAGEMENT

USDA United States  
Department of  
Agriculture

 NRCS  
Natural  
Resources  
Conservation  
Service

Ecological  
Sciences  
Division

October 2003

Nutrient Management Technical Note No. 3

# Feed and Animal Management for Swine (Growing and Finishing Pigs)

### Introduction

Swine operations may include a complete farrow to finishing unit, or various combinations of separate units for feeder pig production, including nursery units, grower-finishing pigs, or the breeding herd. Each stage of the life cycle requires distinctly different diets, resulting in great differences in the volume and nutrient composition of the manure produced.

This technical note briefly highlights some factors affecting nutrient excretion. These factors include potential dietary adjustments that can be used to minimize excess nutrient excretion from growing-finishing pigs.

Selected nutrient requirements for pigs of different sizes, as listed in the National Research Council's (NRC) publication *Nutrient Requirements of Swine* (10th revised edition, 1998), are given in table 1. Reference to these guidelines is important for a thorough evaluation of all swine diets, including the breeding herd, on a commercial operation.

**Table 1** Selected nutrient requirements for grower-finisher pigs<sup>1</sup>

Nutrient (% or unit/kg of diet, 90% dry matter)	Pig wt. 7-11 lb	Pig wt. 11-22 lb	Pig wt. 22-44 lb	Pig wt. 44-110 lb	Pig wt. 110-175 lb	Pig wt. 175-265 lb
Crude Protein, %	26.00	23.70	20.90	18.00	15.50	13.20
Lysine, %	1.50	1.35	1.15	0.95	0.75	0.60
Lysine, % true ileal dig.	1.34	1.19	1.01	0.83	0.66	0.52
Calcium, %	0.90	0.80	0.70	0.60	0.50	0.45
Phosphorus, % total	0.70	0.65	0.60	0.50	0.45	0.40
Phosphorus, % available	0.55	0.40	0.32	0.23	0.19	0.15
Potassium, %	0.30	0.28	0.26	0.23	0.19	0.17
Sodium, %	0.25	0.20	0.15	0.10	0.10	0.10
Copper, mg/kg	6.00	6.00	6.00	4.00	3.50	3.00
Zinc, mg/kg	100.00	100.00	80.00	60.00	50.00	50.00

This is the third in a series of nutrient management technical notes on feeding management.

Series was prepared by Dr. Alan Sutton, professor of Animal Science at Purdue University, West Lafayette, Indiana, and Charles H. Lander, national agronomist, NRCS, Washington, DC. This series was developed from material published by the Federation of Animal Science Societies (FASS), Savoy, Illinois.

<sup>1</sup> Adapted from tables 10-1 and 10-5 in *Nutrient Requirements of Swine*, revised edition, 1998, National Research Council (NRC), National Academy of Sciences, National Academy Press, 2101 Constitution Avenue, Washington, DC 20148 (G.L. Cromwell, chair, Subcommittee on Swine Nutrition).

### Diet formulation

Feeding diets that are higher in crude protein or phosphorus (P) than required by swine result in manure with more concentrated N and P. Producers should feed diets that meet the requirements of their animals without having excess overages.

**Phase feeding.** Dividing the growth period of the pigs into several periods with a small spread in body weight allows producers to provide diets that more closely meet the pig's nutrient requirements. Feeding three or four diets during the grow-finish (G-F) period, compared with feeding only two diets during this period, would reduce N and P excretion by at least 6 to 10 percent.

**Split-sex feeding.** Gilts require more protein and amino acids than barrows. Penning barrows separate from gilts allows the feeding of lower protein and amino acid levels to barrows without compromising the growth and performance efficiency of gilts. It also reduces nutrient waste, and can reduce N excretion by at least 6 to 10 percent.

**Formulate diets on an available nutrient basis.** A high proportion (65-80%) of the P in cereal grains and oilseed meals occurs as phytate. Phosphorus in this form is not well utilized by pigs because they lack sufficient intestinal phytase, the enzyme needed to remove the phosphate from the phytate molecule. Therefore, supplemental P is added to the diet to meet the pig's phosphorus requirements for growth and bone formation. The indigestible phytate P and any excess P in the diet are excreted in the feces.

Supplementing the diet with the enzyme phytase is one of the most effective means of increasing the breakdown of phytate P in the digestive tract and reducing P excreted in the feces. Using phytase allows a lower level of supplemental inorganic P in the diet because a portion (35%) of the unavailable phytate P in the grains is released and made available by the phytase enzyme to help meet the pig's P needs. Inclusion of phytase increases the availability of P in a corn-soy diet by threefold, from approximately 16 percent up to 46 percent, and results in reduced P excretion of 20 to 30 percent.

Because some feedstuffs are high in phytate and because there is some endogenous phytase in certain small grains (wheat, rye, triticale, barley), the bioavailability of P in feed ingredients varies widely. For example, the P in corn is only 12 to 16 percent available, while the P in wheat is 60 percent available.

The P in dehulled soybean meal is more available than the P in cottonseed meal (23% vs. 1%), but neither source of P is as highly available as the P in meat and bonemeal (90%), fishmeal (93%), or dicalcium phosphate (95%). To reduce excretion levels, diets should be formulated on an available P basis according to NRC (1998) recommendations, making any adjustments needed for farm-specific pig performance.

Some feed manufacturers formulate swine feeds on an ideal protein basis. An ideal protein is one in which the amino acids closely match the animal's requirements for lean tissue protein synthesis and maintenance. One way of doing this is to reduce the crude protein level in the diet and supplement with synthetic amino acids. Although nutritionists cannot prepare perfect amino acid balances from natural feed ingredients, using computers and an array of many different ingredients and synthetic amino acids allows them to produce feeds that have reduced amino acid excesses. Reducing the crude protein in the diet by 3 to 4 percent and supplementing with synthetic amino acids (generally, lysine, methionine, threonine, and tryptophan) have shown a 20 to 40 percent reduction in N excretion.

### Feed management

Controlling feed wastage improves herd feed conversion and reduces nutrient losses. Feed wasted in the manure pit can add considerably to the nutrients that need to be applied to the land. Check and adjust feeders often to reduce wastage.

Wet-dry feeding systems can significantly reduce feed and water wastage. Some research has shown that manure volume per pig was reduced by 30 to 50 percent by using wet-dry feeding systems. However, the nutrient concentrations in the manure from a wet-dry feeding system generally are significantly higher. Therefore, routine manure analyses are needed to adjust application rates of such manure to cropland.

The mineral content of the water supply should be considered with regard to the total intake of dietary minerals. Depending on the quality of the water supply available, water intake may make a substantial contribution to daily mineral intake, particularly with regard to sulfur and, in some areas of the country, salt. Routine water sampling can help the nutritionist formulate properly for the amount of minerals that need to be added to the diet to meet the animal's actual requirements.

Maintaining pigs under comfortable environmental temperature and humidity conditions improves feed utilization and can reduce nutrient excretion. Cold temperatures increase caloric requirements for body maintenance, and, therefore, increase feed intake and nutrient excretion. Likewise, extremely hot temperatures reduce feed intake, decrease growth rate, and increase time to market, thereby ultimately increasing nutrient excretion.

Raising genetically lean pigs (rather than fat ones), controlling diseases and parasites, and using good management practices are further examples of how one can improve feed conversion efficiency and reduce nutrient excretion.

Fine grinding (600 to 700 microns is most desirable) and pelleting feed are also effective ways in improving feed utilization and decreasing dry matter manure volume. Dry matter manure volume may be reduced by 15 percent, and nutrient excretion, especially N, by about 5 percent. By reducing the particle size, the surface area of the grain particles is increased, allowing greater interaction with digestive enzymes. Addition of enzymes, such as phytase, amylase, protease, and glucanase, may release nutrients that will enhance nutrient retention and reduce excretion. This is especially true in corn-soybean meal diets.

### Summary

The National Research Council's *Nutrient Requirements for Swine*, 1998 edition, is a key reference to evaluate all swine diets, including the breeding herd, on a commercial operation.

Also, consult qualified nutritionists to accurately evaluate current or planned diet compositions during the development of conservation plans, particularly Comprehensive Nutrient Management Plans (CNMPs).

Using multiple strategies in the formulation of swine diets and techniques to improve feed use efficiency can significantly reduce the nutrient content of excreted manure. The potential for these strategies to impact manure nutrient content is shown in table 2.

The actual impact of a feed management strategy or strategies on a swine operation can only be determined by analysis of the manure after the strategy has been implemented. During the development of CNMPs, the potential impact of a strategy or strategies can be estimated using the values in table 2. In using data from this table, planners are encouraged to be

conservative in their selection of factors. Also, it is important to remember that the impact of using multiple strategies in a single diet is not likely to be additive for each single strategy being used. Rather, it is more likely to be something greater than the value for the strategy with the smallest impact, but less than the sum of values for all the individual strategies being used.

During the development of CNMPs, it is better to underestimate the potential impact of feed management than to overestimate it. Later, the plan can be modified based upon data accumulated from the actual production operation.

**Table 2** Potential for feed management to impact the nutrient content of swine manure <sup>1</sup>

Strategy	Nitrogen reduction %	Phosphorus reduction %
Formulate diet closer to requirement	10-15	10-15
Reduced protein/AA supplementation	20-40	n/a <sup>2</sup>
Use highly digestible feeds	5	5
Phytase/low phosphorus diet	2-5	20-30
Selected enzymes	2-5	5
Growth promotants	5	5
Phase feeding	5-10	5-10
Split-sex feeding	5-8	n/a <sup>2</sup>

<sup>1</sup> Adapted from the Federation of Animal Science Societies (FASS) publication, *Dietary Adjustments to Minimize Nutrient Excretion from Livestock and Poultry*, January 2001.

<sup>2</sup> Not applicable.

### Glossary

**Available nutrient basis.** Formulating a diet based on the bioavailability of the nutrients from the feed ingredients in the diet for the intended production purposes.

**Bioavailability of nutrients.** The amount of nutrient in the diet that is released in the digestion process and that can be absorbed in a form that can be used in the body for normal metabolic functions of the nutrient.

**Crude protein.** A measure of dietary protein that is based on the assumption that the average amino acid in a protein contains 16 percent nitrogen. Thus, total chemically determined nitrogen  $\times 6.25$  ( $100 \div 16$ ) = crude protein.

## Feed and Animal Management for Swine

---

**Diet formulation.** The process of combining an assortment of feed ingredients into a diet that will meet the nutrient and energy requirements of the animal for the intended purpose for which the animal is produced.

**Digestibility.** The relative amount of nutrients released from the digestion process.

**Endogenous.** Nutrients within the animal that may be produced or synthesized. Excretion of endogenous nutrients may occur from the recycling of nutrients and normal cellular metabolic processes.

**Endogenous phytase.** The enzyme naturally derived within the animal or from microbial sources within the animal that degrades phytate and releases phosphorus.

**Ideal protein basis.** Formulation of a diet based on the concept that the protein content of the diet has a balance of amino acids that exactly meet an animal's amino acid requirements.

**Phase feeding.** Changing the nutrient concentrations in a series of diets formulated to meet an animal's nutrient requirements more precisely at a particular stage of growth or production.

**Phytase.** An enzyme that degrades phytate, making phosphorus available to nonruminants.

**Phytate phosphorus.** A complex, organic form of phosphorus that is bound to the phytate molecule and is not readily digested by nonruminant animals.

**Split sex feeding.** A feeding and housing program that divides animals by gender and formulates diets to meet the specific nutrient requirements of each sex more precisely.

**Wet-dry feeding systems.** Feeding systems designed to introduce water with dry feeds either at prescribed periods or on demand by the animal. Introducing water at the time of feeding also reduces the potential for water spillage and dust from feed sources.

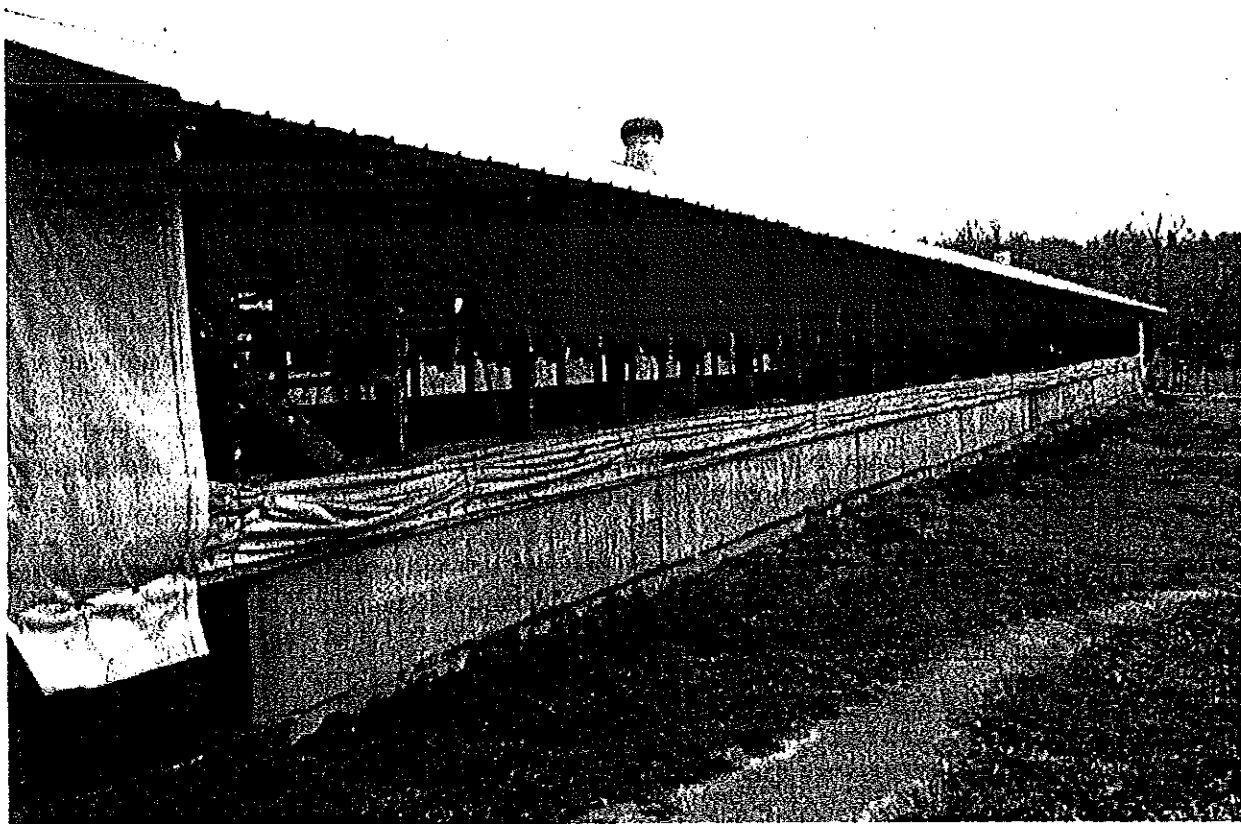
• • • • •

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-6964 (voice and TDD). USDA is an equal opportunity provider and employer.

## Section 8 RECORDKEEPING FORMS

Manure application record  
Soil test not more than five years old  
Results of annual manure analysis  
Other nutrients applied (commercial, chicken litter)  
Weather conditions (footnote on application records)  
General soil conditions at time of application (footnote on application records)  
Actual crop and yield harvest from application sites  
Record of internal inspections for system components  
Record of any spills  
Record of manure exports to land-use contract farms  
Manure imports to farm (if any)  
Internal imports of manures and wastewater (if any)  
Inspection/Monitoring records of the facility  
Closure plan



## **SECTION 8 – RECORD KEEPING**

It is important to document and demonstrate implementation activities associated with this CNMP. This documentation provides valuable information that can be used to adjust the CNMP to meet production and natural resource conservation objectives.

It is the responsibility of the owner/operator to maintain records that document the implementation and management of the CNMP.

### **ARKANSAS RECORD KEEPING AND EDUCATIONAL REQUIREMENTS**

The Arkansas Department of Environmental Quality (ADEQ) requires that the following test results and records be submitted to them annually by May 30<sup>th</sup> from any person operating a liquid waste management and disposal system. All sampling and analysis shall be in accordance with the University of Arkansas Cooperative Extension Service guidelines.

1. Records shall be kept on all waste/wastewater applications. A log shall be kept at the facility showing dates, volumes or weights, destinations and acreage over which the wastes are applied.
2. A representative sample of the waste/wastewater shall be collected once per year and analyzed for the following parameters: pH, total nitrogen, ammonia nitrogen, potassium, phosphorous, water extractable phosphorous (WEP), and percent solids. The results shall be included in the final yearly report.
3. The soils of each field where liquid waste has been applied shall be sampled annually and analyzed in the spring, prior to application of wastes, for the following parameters: pH, potassium, phosphorous and nitrates. The results shall be included in the final yearly report.
4. All managing owners or managing operators of waste management systems must provide certification of satisfactory completion of a minimum of 4 hours of individualized training and educational requirements. The certification is to be submitted with the permit application or within one year of the effective date of the issued permit. An operator must also provide certification that he/she had an annual refresher course in the areas of waste management and odor control. The courses will be developed under supervision of the Cooperative Extension Service which will provide certification to the Department.

It should be noted that these are ADEQ requirements and any failure to produce or obtain the reports and/or educational requirements shall be deemed a violation of Regulation No. 5 and the permit.

The following tables may be used for record keeping.









**Record of any spills:**

**Manure imports onto farm (broiler litter, other swine waste):**

**Internal transfers of manures:**

**Inspection monitoring dates:**

**Forage yields on various fields:**

## SECTION 8 – CLOSURE PLAN

If this operation ceases to function for animal confinement and manure storage, it shall be closed as follows. Manure and wastewater will be agitated and pumped to the extent that conventional pumping will allow. Clean water shall be added, as necessary, to facilitate agitation and sludge removal. Remaining solids in the settling basins and holding pond shall be removed. Wastewater conveyances from the animal storage facilities to the waste storage facilities shall be removed or capped to prevent additional waste streams entering the closed impoundments. The removed wastes shall be utilized in accordance with NRCS conservation practice standard, Nutrient Management (Code 590), and applied in accordance with the recommended application rates as indicated in this CNMP, Section 6.

**Land Reclamation.** Impoundments with embankments, when cleaned, may be breached such that they will no longer impound water. Excavated impoundments, when cleaned, may be backfilled so that these areas may be utilized for other purposes. Contact the Harrison NRCS Office before beginning the clean-out and closure of these structures. NRCS will provide plans for backfilling or conversion to fresh water impoundments for these structures. NRCS will also provide certification that these structures were cleaned out and reclaimed in accordance with NRCS specifications, as this is a condition of permit closure.

- **For Conversion to Fresh Water Impoundments:** NRCS will provide technical assistance to insure that the converted pond meets the NRCS Pond Specification (378). This will include side slope and spillway requirements.
- **For Backfilled Impoundments:** NRCS will calculate the volume of earthfill required to backfill the impoundment, including a 10% overfill for settling, and will provide a vegetation plan for all disturbed areas.

**Protection.** All disturbed areas shall be vegetated in accordance with the NRCS conservation practice standard, Critical Area Planting, Code 342.

## **Section 9 REFERENCES**

**Documentation of compliance (permits, certificates, letter to neighbors, notification to health department, disclosure statements)**  
**Operation and maintenance requirements**

### **REFERENCES:**

**NRCS NATIONAL PLANNING PROCEDURES HANDBOOK**

**NRCS NATIONAL ENGINEERING MANUAL**

**NRCS NATIONAL AGRONOMY MANUAL**

**NRCS ENVIRONMENTAL COMPLIANCE HANDBOOK**

**NRCS CULTURAL RESOURCES HANDBOOK**

# ADEQ

ARKANSAS  
Department of Environmental Quality

May 18, 2000

Richard E. Campbell  
C & C Hog Barn  
P.O. Box 45  
Vendor, AR 72683

RE: CSN NO. 51-0020, PERMIT NO. 3540-WR-4

Dear Mr. Campbell:

The Department has received your request for a state water permit transfer due to a change of ownership of the referenced facility. As a result, the Department has administratively transferred the permit to your name. The enclosed permit is your authority to operate and maintain the waste disposal system. Please carefully review the requirements of the permit conditions and waste management plan. The waste disposal system or its operation may not be changed without prior approval from the Department.

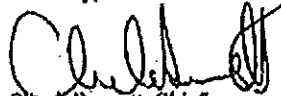
The waste management plan for this facility lists the sites approved for waste application under the referenced permit. (Please contact the previous permittee or the Natural Resources Conservation Service to obtain a copy of the waste management plan.) The approved sites were either owned by or contracted to the previous permittee for waste application.

Only those sites included in the waste management plan may be used for waste application. If any new waste application site(s) are to be added to this permit, a site management plan for each site must be submitted to the Department along with an application for permit modification.

Records must be kept for all land applied waste (see Permit Condition No. 28). For your convenience, two waste application log sheets are included. You may use these sheets (please make additional copies as needed) or other means of documentation for recording and reporting your waste applications. In addition, two copies of the annual report form are enclosed. Please complete and submit the annual report to the Department by to May 30 of each year.

Please write the above referenced Permit and CSN numbers on all documents you submit to the Department. If you have any questions, please contact the State Permits Branch at (501) 682-0648.

Sincerely,



Chuck Bennett, Chief  
Water Division

Enclosures

cc: Dan Morgan, ADEQ District Field Inspector  
Keith E. Karmel, ADEQ Engineer  
Margaret Lonadler, District Conservationist, NRCS  
Shenel Sandidge, PC&E Commission Office  
Permit File



**PERMIT**  
ISSUED BY  
**STATE OF ARKANSAS**  
**DEPARTMENT OF ENVIRONMENTAL QUALITY**  
8001 NATIONAL DRIVE, P.O. BOX 8913  
LITTLE ROCK, ARKANSAS 72219-8913



CSN No. 51-0020

Effective Date 05/23/2000

Permit No. 3540-WR-4

Expiration Date N/A

TO:

Richard E. Campbell  
C & C Hog Barn  
P.O. Box 45  
Vendor, AR 72683

This permit is your authority to operate and maintain the waste disposal system in Section 34, Township 15 north, Range 21 West, in Newton County as set forth in your application received April 3, 2000. This permit is issued subject to provisions of the Arkansas Water and Air Pollution Control Act (A.C.A. Sec. 8-4-10) et seq.) and the following thirty-six (36) conditions:

1. The waste management system shall be constructed and operated in accordance with the Waste Management Plan as approved by the Department of Environmental Quality.
2. Failure to begin construction within 6 months of the effective date may result in termination of this permit if a request for an extension is not submitted to the Department in a timely manner.
3. The disposal system shall be operated by qualified personnel and maintained in good operating condition at all times.
4. Bypassing of the disposal system is prohibited and will result in revocation of this permit and/or other appropriate enforcement action by the Department.
5. There must be no increase in the volume or strength of the waste being treated by the disposal system except within design limits covered by the waste management plan approved by the Department.
6. This permit may be revoked or modified at any such time the Department considers necessary, in order to prevent or abate pollution of any waters of the state.
7. Nothing contained herein must be construed as releasing the permittee from any liability for damage to persons or property by reason of the installation, maintenance or operation of the disposal system.
8. This permit is issued in reliance upon the statements and representations made in the application and the Waste Management Plan, and the Department has no responsibility for the adequacy or proper functioning of the disposal system.
9. The Department may issue authorization for the operation of the facility after having received an inspection report from the consultant verifying that the facility was constructed according to the Waste Management Plan prepared by the consultant and approved by the Department. If conditions prohibit construction according to the approved design, then the consultant shall submit a modified Waste Management Plan to the Department for approval.
10. **OPERATION SHALL NOT COMMENCE FOR NEW OR MODIFIED WASTE DISPOSAL FACILITIES UNTIL THE PERMITTEE HAS OBTAINED A LETTER OF APPROVAL FROM THE DEPARTMENT.**

PLEASE NOTE ADDITIONAL CONDITIONS ON THE ATTACHED SHEETS.

ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY

By:

  
Cheryl D. Smith  
Chief, Water Division

5/23/00  
Date

**ADDITIONAL CONDITIONS FOR DRAFT PERMIT NO. 3540-WR-4 AND CSN NO. 51-0020:**

11. **This Permit is for the Operation of a 312 sow/200 pig swine facility. WASTE MUST NOT BE DISCHARGED FROM THIS OPERATION TO THE WATERS OF THE STATE OR ONTO THE LAND IN ANY MANNER WHICH MAY RESULT IN RUNOFF TO THE WATERS OF THE STATE.**
12. The permittee must comply with all applicable permit fee requirements for state permits as described in ADEQ Regulation No. 9, Fee System for Environmental Permits, as amended. Failure to promptly remit all required fees shall be grounds for the Director to initiate action to terminate this permit under the provisions of ADEQ Regulation No. 8, as amended.
13. The permittee will be responsible for assuring that the land owners of all waste application sites and the waste applicator abide by the conditions of this permit. The permittee will not be responsible for any waste that has been removed from this facility and land applied by a separately permitted waste applicator.
14. The permittee must satisfy all initial and annual training requirements as specified in ADEQ Regulation No. 5.
15. The Department reserves the right to require additional measures to eliminate public nuisance conditions.
16. The permittee must take all reasonable and necessary measures to minimize obnoxious and offensive odors.
17. Dead animal disposal must be in accordance with the waste management plan approved by the Department.
18. Appropriate waste handling equipment must be available for effective operation of the system.
19. Freeboard on settling basins must not be less than 12 inches.
20. Freeboard on the waste storage basin/treatment lagoon must not be less than the required design freeboard shown in the waste management plan approved by the Department.
21. Solid material accumulated in the waste storage basins must be removed in order to maintain the basin design volume.
22. Waste storage basin liners must be maintained to prevent leakage or seepage. Any leaks or seeps shall be reported to the Department and appropriately corrected. Any discharge from the waste storage system such as an overflow, broken pipe, etc., must be reported to the Department immediately.
23. Waste must be evenly distributed over application sites at the rates specified in the waste management plan.
24. Waste must not be land applied when soil is saturated, frozen or covered with ice or snow.
25. Waste must not be land applied during the 24-hour period preceding a precipitation event or during the precipitation event itself.
26. Waste must not be applied on slopes with a grade of more than 15% or in any manner that will allow waste to enter the waters of the State or to run onto adjacent property.
27. Waste must not be land applied within 100 feet of streams including intermittent streams, ponds, lakes, springs, sinkholes, rock outcrops, wells and water supplies; or 300 feet of extraordinary resource waters as defined by the Department's Regulation No. 2, Water Quality Standards for Surface Waters of the State of Arkansas, as amended. Buffer distances for streams, ponds and lakes shall be measured from the ordinary high water mark.



28. Waste must not be land applied within 50 feet of property lines or 500 feet of neighboring occupied buildings existing as of the date of the permit. The restrictions regarding property lines or neighboring buildings may be waived if the adjoining property is also approved as a land application site under a permit issued by the Department or if the adjoining property owner consents in writing.
29. No waste may be land applied in areas prohibited by Arkansas Department of Health regulations for the protection of public water supplies.
30. Records must be kept of all land applied waste and must include, at a minimum, the following: date of application, weight and/or volume applied, waste destination and number of acres over which the waste was applied. All records and logs shall be kept at the facility and provided to the Department upon request.
31. A representative sample of the waste to be land applied must be collected periodically, at a minimum of once each year, and analyzed for the following parameters: pH, Total Nitrogen, Ammonium Nitrogen, Potassium, Phosphorus and percent solids. The analysis must be performed by a laboratory that is certified by the Department.
32. Prior to the application of wastes, the soils of each waste application site must be sampled and analyzed annually for the following parameters: pH, Potassium, Phosphorus and Nitrates.
33. Methods and timing of sampling and analysis described in this permit must be in accordance with the University of Arkansas Cooperative Extension Service guidelines.
34. Annual reports for the previous year must be submitted to the Department prior to May 30 of each year and must include the following: waste analyses conducted under Permit Condition No. 32.; soils analyses conducted under Permit Condition No. 33.; and the location, volume of waste applied, nitrogen application rate, method of waste application and type of crop(s) grown for each waste application site. Reports must be submitted on forms provided by the Department.
35. The addition of waste application sites to this permit must be approved by the Department prior to use and may require a permit modification.
36. Should the facility covered by this permit cease operations, the permittee shall submit to the Department a closure plan for the liquid waste system storage/treatment structure(s) within sixty (60) days of the final day of operation.

STATEMENT OF BASIS

THIS IS A STATE WATER PERMIT FOR A NO-DISCHARGE OPERATION UNDER PERMIT NUMBER 3540-WR-4 AND CSN (FILE) NUMBER 51-0020. WASTE MUST NOT BE DISCHARGED FROM THIS FACILITY TO THE WATERS OF THE STATE OR ONTO LAND IN ANY MANNER WHICH MAY RESULT IN RUNOFF TO THE WATER OF THE STATE.

ISSUING OFFICE:

May 18, 2000

Arkansas Department of Environmental Quality  
Water Division, State Permit Branch  
8001 National Drive  
Post Office Box 8913  
Little Rock, Arkansas 72219

ADEQ EVALUATING ENGINEER: Keith E. Karmel

APPLICANT:

Richard E. Campbell  
C & C Hog Barn  
P.O. Box 45  
Vendor, AR 72683

870-434-5974

1. FACILITY INFORMATION

SIC Code: 0213

Facility Type and Size: 312 sow/200 pig swine facility

Waste Storage/Treatment Component(s): Holding pond

Freeboard Information: 19 inches

Washwater Source: Recycled

Waste Application Method: Liquid manure spreader

Total Available Acreage: 125

Minimum Acreage Required: 37

Dead Animals Will Be Disposed By: Burial

Stream Segment: 4J Nearest Stream: Shop Creek-East Fork

Nearest Community: Deer County: Newton

Section: 34 Township: 15 north Range: 21 West

Latitude: 35° 54' 43" Longitude: 93° 12' 09"

Road Location Description: Approx. 2 miles north of Hwy. 16/Hwy. 7 intersection on Smith Mountain Rd.

Additional Site Information: Ownership transferred; Previous permittee Harl Bohannon

List of all Land Application Sites:

Site No.	Owner Name	Section	Township	Range	Total Available Acres
1	Richard Campbell	34	15 North	21 West	30
2	Harl Bohannon	20, 29	15 North	21 West	21
3	Harl Bohannon	28	15 North	21 West	8
4	Harl Bohannon	30	15 North	21 West	10
5	Darryl Campbell	34	15 North	21 West	13
6	Eugene Casey	4	15 North	21 West	31
7	John Gunter	33	15 North	21 West	12
Total Acres:					125

2. GENERAL REQUIREMENTS

The storage volume required for the waste generated is based on the size of the facility and the amount of waste produced. The waste storage facility must be designed to handle manure, washwater and rainwater minus evaporation for at least 120 days. This will provide for temporary storage of wastes. The management of the waste storage facility requires that specific freeboard be provided at all times. This freeboard is to provide storage for rainfall from a 25-year, 24-hour design storm event plus the minimum design freeboard of 12 inches. Freeboard for settling basins must be maintained at not less than 12 inches.

Solid material accumulated in all waste storage basins shall be removed as necessary to maintain the basin's design volume. Storage basin liners shall be maintained to prevent leakage or seepage. Any leaks or seeps shall be reported to the Department and appropriately corrected. Any discharge from the waste storage system such as an overflow, broken pipe, etc., must be reported to the Department immediately.

Frequent pump-down of the waste storage facility, especially a total pump-down prior to winter, is necessary in order to reduce the likelihood of overtopping the embankments. Wastes should not be applied to dormant pastures or crops. The storage facility shall not be cut, breached or have a spillway of any type.

Based on estimates of nitrogen uptake of specific crops in the form of Plant Available Nitrogen (PAN) a minimum number of acres, excluding buffer zones, must be available as per the management plan.

As required by Regulation No. 5, the permittee must submit a report to the Department prior to May 30 of each year (Annual Report Form will be provided by the Department). The annual report must include the copy of soil analysis for each field and waste analysis. The waste analysis must include pH (su), Total Nitrogen, Ammonia Nitrogen, Total Potassium (lbs/ac), Total Phosphorus (lbs/ac), and Percent Solid. The soil analysis must include pH(su), Potassium (lbs/ac), Phosphorus (lbs/ac), and Nitrates (lbs/ac).

3. BASIS FOR PERMIT CONDITIONS

The Arkansas Department of Environmental Quality has made a tentative determination to issue a permit for the no-discharge facility as described in the application and waste management plan. Permit requirements and conditions are based on Regulation No. 5 and regulations pursuant to the Arkansas Water and Air Pollution Control Act (Act 472 of 1949, as amended, Ark. Code Ann. 8-4-101 et. seq.).

4. SOURCES FOR DOCUMENT DEVELOPMENT

- A. Regulation No. 5, Liquid Animal Waste Management Systems.
- B. Regulation No. 2, Water Quality Standards for Surface Waters of the State of Arkansas, as amended.

- C. Regulation No. 8, Administrative Procedure, as amended.
- D. Regulation No. 9, Fee System for Environmental Permits, as amended.
- E. USDA Natural Resources Conservation Service (NRCS) Publications
  - (1) Field Office Technical Guide.
  - (2) Animal Waste Management Field Manual.
  - (3) Technical Note 716, Lining Requirements.
  - (4) Technical Note 102 Supplementing Nutrient and Pest Management Practice Standards.
- F. Act 165 of 1993, Public Notice Requirements.
- G. ACT 472 of 1949, Arkansas Water and Air Pollution Control Act, as amended.

5. ADDITIONAL INFORMATION

For additional information, contact:

Doug Szenher, Information Officer  
Arkansas Department of Environmental Quality  
8001 National Drive  
P.O. Box 8913  
Little Rock, Arkansas 72219-8913

Insert a copy of the producers permit from A.D.E.Q.

I've been inserting a copy of the letter to the Health Department that was generated when the permit was issued, finding a copy may be a problem.

Insert a copy of the disclosure statement if it can be found

Insert application to A.D.E.Q. go to their web site for the application, caution they have lots of applications, get the right one liquid animal waste.

LAND USE CONTRACT

I, Wilma Middleton, agree to allow C & L Hog Farm  
Name of Landowner Name of Operation/Owner  
to land apply waste from his/her Swine operation located in the E 1/2 of  
Type of Animal 1/2 Section  
Section 34 in Township 15N and Range 21W in  
Section Township Range  
Newton County to 103.6 acres of my property located in  
County of Operation Total Acreage Available  
Newton County. A description of the areas to be used as waste  
County of Application Site  
application sites are as follows:

Long. 93° 09' 20"  
Lat. 35° 54' 46"

Site No.	1/4 Section	Section	Township	Range	Available Acreage
RM 2	SE, NE	36	15N	21W	82.2
RM 2	SE, NE	25+36	15N	21W	21.4

\*Available acreage is the total acreage minus buffer zone areas.

I am also aware that the land applicator or the owner of the operation is to apply waste according to the management plan developed and submitted by the Natural Resource Conservation Service or a registered professional engineer or an Arkansas Natural Resources District Water Quality Technician and as per guidelines and conditions set forth by the Arkansas Department of Environmental Quality. In addition to these guidelines, the following requirements must also be satisfied when applying waste to my land:

---



---



---



---

Robert/Wilma Middleton Farm

Robert Cooper 4-15-11  
Operation Owner Signature Date

Wilma Middleton 4-15-11  
Landowner Signature Date

**LAND USE CONTRACT**

I, Harl Behannon, Landowner, agree to allow C + C New Farm, Operation Owner, to land apply waste from his/her Swim operation located in the E 1/2 1/4 of Section 24 in Township 15N and Range 21W in Newton County to 40.7 acres of my property located in Newton County. A description of the areas to be used as land application sites are as follows:

Site No.	1/4 Section	Section	Township	Range	Latitude	Longitude	Available Acreage
H01	E 1/2	30	14N	21W	25°50'38"	93°14'31"	11.1
H02	SW NW	20, 29	14N	21W	25°50'48"	93°14'05"	19.7
H03	SW	28	14N	21W	25°50'01"	93°13'19"	9.9

\*Available acreage is the total acreage minus buffer zone areas.

I am also aware that the land applicator or the owner of the operation is to apply waste according to the management plan and guidelines and conditions set forth by the Arkansas Department of Environmental Quality.

In addition to these guidelines, the following requirements must also be satisfied when applying waste to my land:

---



---



---

Richard Lippman 4-15-11 Operation Owner Signature Date Harl Behannon 4-15-11 Landowner Signature Date

**LAND USE CONTRACT**

I, Charles Bursier Landowner, agree to allow C + C Hog Farm Operator of Operation to land apply waste from his/her Swine operation located in the E 1/2 1/4 of Section 34 in Township 15N and Range 21W in Newton County to 200.5 acres of my property located in Newton County. A description of the areas to be used as land application sites are as follows:

Site No.	1/4 Section	Section	Township	Range	Latitude	Longitude	Available Acreage*
LOB-1	E 1/2 1/4	21 + 14	15N	21W	35° 56' 32"	93° 06' 51"	200.5
LOB-2	W 1/2 1/4						
	20 ac						
	NE 1/4 of 20						

\* Available acreage is the total acreage minus buffer zone areas.

I am also aware that the land applicator or the owner of the operation is to apply waste according to the management plan and guidelines and conditions set forth by the Arkansas Department of Environmental Quality.

In addition to these guidelines, the following requirements must also be satisfied when applying waste to my land:

---



---



---



---

Richard Campbell Operation Owner Signature      1-13-11 Date  
Charles Bursier Landowner Signature      1-13-11 Date



LAND USE CONTRACT

I, Wallace E. Caspy, agree to allow C & C Hog Farm  
Name of Landowner Name of Operation Owner  
to land apply waste from his/her Swine operation located in the E 1/2 of  
Type of Animal % Section  
Section 24 in Township 15N and Range 21W in  
Section Township Range  
Newton County to 14.5 acres of my property located in  
County of Operation Total Acreage Available  
Newton County. A description of the areas to be used as waste  
County of Application Site  
application sites are as follows: Long. 93° 12' 26"  
Latitude 35° 54' 10"

Site No.	% Section	Section	Township	Range	Available Acreage <sup>1</sup>
ECA	NE	4	14N	21W	4.8
ECB	NE	4	14N	21W	9.7

<sup>1</sup> Available acreage is the total acreage minus buffer zone areas.

I am also aware that the land applicator or the owner of the operation is to apply waste according to the management plan developed and submitted by the Natural Resource Conservation Service or a registered professional engineer or an Arkansas Natural Resources District Water Quality Technician and as per guidelines and conditions set forth by the Arkansas Department of Environmental Quality. In addition to these guidelines, the following requirements must also be satisfied when applying waste to my land:

---



---



---



---

Richard Campbell 4-15-11  
Operation Owner Signature Date

Wallace E. Caspy 4-15-11  
Landowner Signature Date

LAND USE CONTRACT

I, Daryl Campbell, agree to allow C & C Hay Farm  
Name of Landowner Name of Operation Owner  
 to land apply waste from his/her Swine operation located in the E 1/2 of  
Type of Animal 1/2 Section  
 Section 34 in Township 15N and Range 21W in  
Section Township Range  
Newton County to 15.7 acres of my property located in  
County of Operation Total Acreage Available  
Newton County. A description of the areas to be used as waste  
County of Application Site  
 application sites are as follows: Long. 93° 12' 01"  
 Lat. 35° 54' 52"

Site No.	1/4 Section	Section	Township	Range	Available Acreage*
DC	N 1/2	34	15N	21W	15.7

\*Available acreage is the total acreage minus buffer zone areas.

I am also aware that the land applicator or the owner of the operation is to apply waste according to the management plan developed and submitted by the Natural Resource Conservation Service or a registered professional engineer or an Arkansas Natural Resources District Water Quality Technician and as per guidelines and conditions set forth by the Arkansas Department of Environmental Quality. In addition to these guidelines, the following requirements must also be satisfied when applying waste to my land:

---



---



---



---



---

Richard Campbell 4-15-11  
Operation Owner Signature Date

Daryl Campbell 4-15-11  
Landowner Signature Date

**LAND USE CONTRACT**

I, Gracy Dotson Landowner, agree to allow C & L Hay Farm Operation Owner  
 to land apply waste from his/her Swine operation located in the E 1/2 1/4 of  
 Section 24 in Township 15N and Range 21W in  
Newton County to 10.2 acres of my property located in  
Newton County. A description of the areas to be used as land  
 application sites are as follows:

Site No.	1/4 Section	Section	Township	Range	Latitude	Longitude	Available Acreage
G-D1	SW	5	13N	21W	35° 49' 30"	93° 08' 39"	10.2

\* Available acreage is the total acreage minus buffer zone areas.

I am also aware that the land applicator or the owner of the operation is to apply waste according to the management plan and guidelines and conditions set forth by the Arkansas Department of Environmental Quality.

In addition to these guidelines, the following requirements must also be satisfied when applying waste to my land:

---



---



---

Richard English 6-15-11  
 Operation Owner Signature Date

[Signature]  
 Landowner Signature Date

LAND USE CONTRACT

I, John Gerner, Name of Landowner, agree to allow C & L Hog Farm, Name of Operating Owner, to land apply waste from his/her Swine, Type of Animal, operation located in the E 1/2 of Section 24 in Township 15N and Range 21W in Newton County to 17 acres of my property located in Newton County. A description of the areas to be used as waste application sites are as follows:

Lat. 35° 45' 10"  
 Long. 93° 12' 25"

Site No.	% Section	Section	Township	Range	Available Acreage
36-A	NE	33	15N	21W	14.0
36-B	NW	34	15N	21W	3.0

\*Available acreage is the total acreage minus buffer zone areas.

I am also aware that the land applicator or the owner of the operation is to apply waste according to the management plan developed and submitted by the Natural Resource Conservation Service or a registered professional engineer or an Arkansas Natural Resources District Water Quality Technician and as per guidelines and conditions set forth by the Arkansas Department of Environmental Quality. In addition to these guidelines, the following requirements must also be satisfied when applying waste to my land:

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Richard Chapman  
 Operation Owner Signature      Date 4-15-11

John Gerner  
 Landowner Signature      Date 4-15-11

**LAND USE CONTRACT**

I, Lynn C. Middleton, Landowner, agree to allow C & L Hay Farm, Operation Owner, to land apply waste from his/her Swine operation located in the E 1/2 1/4 of Section 34 in Township 15N and Range 21W in Newton County to 53.8 acres of my property located in Newton County. A description of the areas to be used as land application sites are as follows:

Site No.	1/4 Section	Section	Township	Range	Latitude	Longitude	Available Acreage
LCM1	SW 1/4	14, 22, 23	14N	21W	35° 51' 37"	93° 11' 22"	18.5
LCM2	NE 1/4	14, 22, 23	14N	21W	5	5	16.2
LCM3	NW 1/4	14, 22, 23	14N	21W	5	5	19.1

\* Available acreage is the total acreage minus buffer zone areas.

I am also aware that the land applicator or the owner of the operation is to apply waste according to the management plan and guidelines and conditions set forth by the Arkansas Department of Environmental Quality.

In addition to these guidelines, the following requirements must also be satisfied when applying waste to my land:

---



---



---

Richard Lophal      4-15-11      Lynn C. Middleton      10-30-10  
 Operation Owner Signature      Date      Landowner Signature      Date

**LAND USE CONTRACT**

I, Michael P. Brattle, Landowner, agree to allow C & C Hog Farm, Operation Owner, to land apply waste from his/her Swine operation located in the E 1/2 Section 29 in Township 15N and Range 21 W in Newton County to 43.8 acres of my property located in Newton County. A description of the areas to be used as land application sites are as follows:

Site No.	1/4 Section	Section	Township	Range	Latitude	Longitude	Available Acreage*
MM1	E 1/2	29	15N	20 W	35°55'20"	93°07'15"	3.1
MM2	E 1/2 W 1/2	28, 29	15N	20 W	35°55'20"	93°07'15"	29.8
MM3	<del>W 1/2</del> E 1/2	<del>28, 29</del> 29	15N	20 W	35°55'20"	93°07'15"	10.9

\*Available acreage is the total acreage minus buffer zone areas.

I am also aware that the land applicator or the owner of the operation is to apply waste according to the management plan and guidelines and conditions set forth by the Arkansas Department of Environmental Quality.

In addition to these guidelines, the following requirements must also be satisfied when applying waste to my land:

---



---



---

Richard Conaway 1-13-11 Michael P. Brattle 1-1-10  
 Operation Owner Signature Date Landowner Signature Date

LAND USE CONTRACT

I, Margaret E Mills, agree to allow Richard Campbell C&C Hog Farm  
Name of Landowner Name of Operation Owner  
 to land apply waste from his/her Swine operation located in the E 1/2 of  
Type of Animal 1/2 Section  
 Section 34 in Township 15N and Range 21W in  
Section Township Range  
Newton County to 73.66 acres of my property located in  
County of Operation Total Acreage Available  
Newton County. A description of the areas to be used as waste  
County of Application Site  
 application sites are as follows: Long 93° 12' 26"  
 Lat. 35° 54' 34"

Site No.	1/4 Section	Section	Township	Range	Available Acreage*
EM1	NW/SE	33	T15N	R21W	6.6
<del>2</del>	<del>SW/SE</del>	<del>33</del>	<del>15N</del>	<del>R21W</del>	<del>6.6</del>

\*Available acreage is the total acreage minus buffer zone areas.

I am also aware that the land applicator or the owner of the operation is to apply waste according to the management plan developed and submitted by the Natural Resource Conservation Service or a registered professional engineer or an Arkansas Natural Resources District Water Quality Technician and as per guidelines and conditions set forth by the Arkansas Department of Environmental Quality. In addition to these guidelines, the following requirements must also be satisfied when applying waste to my land:

---



---



---



---

Richard Campbell 4-15-11 Margaret Mills 3/24/11  
Operation Owner Signature Date Landowner Signature Date

**LAND USE CONTRACT**

I, Phillip Campbell Landowner agree to allow C & L Hog Barn Operation Owner E 1/2 to land apply waste from his/her Swine Type of Operation operation located in the SW 1/4 of Section 28 in Township 15N and Range 2100W in Newton County to 18.3 acres of my property located in Newton County. A description of the areas to be used as land application sites are as follows:

Site No.	1/4 Section	Section	Township	Range	Latitude	Longitude	Available Acreage
PC1	SW/4	28/33	15N	20W	93°55'12"	93°01'10"	18.3

\*Available acreage is the total acreage minus buffer zone areas.

I am also aware that the land applicator or the owner of the operation is to apply waste according to the management plan and guidelines and conditions set forth by the Arkansas Department of Environmental Quality.

In addition to these guidelines, the following requirements must also be satisfied when applying waste to my land:

---



---



---



---

Richard Gonzalez 1-13-11  
Operation Owner Signature Date

Phillip Campbell 1-13-11  
Landowner Signature Date



LAND USE CONTRACT

Attachment 2

I, Ricky Campbell, Name of Landowner, agree to allow C+E Hog Farm, Name of Operation Owner, to land apply waste from his/her Swine, Type of Animal, operation located in the E 1/2 1/2 of Section 34, Section, in Township 15N, Township, and Range 21W, Range, in Newton, County, to 76.2 Total Acreage Available acres of my property located in Newton, County. A description of the areas to be used as waste application sites are as follows:

Long. 93° 11' 30"  
Lat. 35° 52' 13"

Site No.	1/4 Section	Section	Township	Range	Available Acreage*
YIV1	NE	15	14N	21W	22.9
YIV2A	NE	15	14N	21W	13.3

\*Available acreage is the total acreage minus buffer zone areas.

I am also aware that the land applicator or the owner of the operation is to apply waste according to the management plan developed and submitted by the Natural Resource Conservation Service or a registered professional engineer or an Arkansas Natural Resources District Water Quality Technician and as per guidelines and conditions set forth by the Arkansas Department of Environmental Quality. In addition to these guidelines, the following requirements must also be satisfied when applying waste to my land:

---



---



---



---

Ricky Campbell  
Operation Owner Signature      4-15-11  
Date

Ricky Campbell  
Landowner Signature      4-15-11  
Date

**To: Adjacent Landowners**

**January 5, 2011**

**From: C and C Farms  
Richard Campbell  
PO Box 45  
Vendor, AR 72683  
870-434-5974**

**Please be aware that I am requesting that Gary Dotson Farm be included in my spreading acreage. This request is being made to A.D.E.Q in Little Rock, AR (phone number 501-682-0045).**

**The original permit application only allows spreading on my pastures located near my 320 head swine farm (located at T 15 N R 21W section 34) and other farms that are adjacent to Swine farm operation. Part of the liquid waste permit regulations require that I give notice to adjacent land owners when I request a permit modification to add acreage to my spreading acreage. Please contact myself Richard Campbell if you have any questions. Hopefully you will not have any objections to adding this acreage to my spread area that is designated in our liquid waste permit. Waste and liquid spreading on this acreage will be seasonal, not on a day to day basis.**

**Brief legal description of the location of the property: T 13 N R 20 W Section 5**

**Letters have been sent to or by personnel contact to the following individuals:**

**Roger Bohannon  
USFS  
Bill Easter**

**To: Adjacent Landowners**

**January 5, 2011**

**From: C and C Farms  
Richard Campbell  
PO Box 45  
Vendor, AR 72683  
870-434-5974**

**Please be aware that I am requesting that Ricky Campbell Farm be included in my spreading acreage. This request is being made to A.D.E.Q in Little Rock, AR (phone number 501-682-0045).**

**The original permit application only allows spreading on my pastures located near my 320 head swine farm (located at T 15 N R 21W section 34) and other farms that are adjacent to Swine farm operation. Part of the liquid waste permit regulations require that I give notice to adjacent land owners when I request a permit modification to add acreage to my spreading acreage. Please contact myself Richard Campbell if you have any questions. Hopefully you will not have any objections to adding this acreage to my spread area that is designated in our liquid waste permit. Waste and liquid spreading on this acreage will be seasonal, not on a day to day basis.**

**Brief legal description of the location of the property: T 14 N R 21 W Section 15**

**Letters have been sent to or by personnel contact to the following individuals:**

**Lazy Apple Lodge  
USFS  
Lynn Carl Middleton**

**To: Adjacent Landowners**

**January 5, 2011**

**From: C and C Farms  
Richard Campbell  
PO Box 45  
Vendor, AR 72683  
870-434-5974**

**Please be aware that I am requesting that Wilma/Robert Middleton Farm be included in my spreading acreage. This request is being made to A.D.E.Q in Little Rock, AR (phone number 501-682-0045).**

**The original permit application only allows spreading on my pastures located near my 320 head swine farm (located at T 15 N R 21W section 34) and other farms that are adjacent to Swine farm operation. Part of the liquid waste permit regulations require that I give notice to adjacent land owners when I request a permit modification to add acreage to my spreading acreage. Please contact myself Richard Campbell if you have any questions. Hopefully you will not have any objections to adding this acreage to my spread area that is designated in our liquid waste permit. Waste and liquid spreading on this acreage will be seasonal, not on a day to day basis.**

**Brief legal description of the location of the property: T 15 N R 20 W Sections 30 and 31  
T 15 N R 21 W Sections 25 and 26**

**Letters have been sent to or by personnel contact to the following individuals:**

**Mac Ewing  
Bill Perry  
Micheal Ewing  
Jackie Smith**

**To: Adjacent Landowners**

**January 5, 2011**

**From: C and C Farms  
Richard Campbell  
PO Box 45  
Vendor, AR 72683  
870-434-5974**

**Please be aware that I am requesting that Mike Middleton Farm be included in my spreading acreage. This request is being made to A.D.E.Q in Little Rock, AR (phone number 501-682-0045).**

**The original permit application only allows spreading on my pastures located near my 320 head swine farm (located at T 15 N R 21W section 34) and other farms that are adjacent to Swine farm operation. Part of the liquid waste permit regulations require that I give notice to adjacent land owners when I request a permit modification to add acreage to my spreading acreage. Please contact myself Richard Campbell if you have any questions. Hopefully you will not have any objections to adding this acreage to my spread area that is designated in our liquid waste permit. Waste and liquid spreading on this acreage will be seasonal, not on a day to day basis.**

**Brief legal description of the location of the property: T 13 N R 20 W Sections 28 and 29**

**Letters have been sent to or by personnel contact to the following individuals:**

**Bradley Middleton  
Doyle Royce  
Richard Campbell**

**To: Adjacent Landowners**

**January 5, 2011**

**From: C and C Farms  
Richard Campbell  
PO Box 45  
Vendor, AR 72683  
870-434-5974**

**Please be aware that I am requesting that Charles Burdine Farm be included in my spreading acreage. This request is being made to A.D.E.Q in Little Rock, AR (phone number 501-682-0045).**

**The original permit application only allows spreading on my pastures located near my 320 head swine farm (located at T 15 N R 21W section 34) and other farms that are adjacent to Swine farm operation. Part of the liquid waste permit regulations require that I give notice to adjacent land owners when I request a permit modification to add acreage to my spreading acreage. Please contact myself Richard Campbell if you have any questions. Hopefully you will not have any objections to adding this acreage to my spread area that is designated in our liquid waste permit. Waste and liquid spreading on this acreage will be seasonal, not on a day to day basis.**

**Brief legal description of the location of the property: T 15 N R 20 W Sections 19,20 and 21**

**Letters have been sent to or by personnel contact to the following individuals:**

**Scott Hankins  
Bernie Finch  
RL Burdine  
Rex Middleton  
Robby Smith  
Edward Smith  
Glen Smith  
Ricky Smith**

**To: Adjacent Landowners**

**January 5, 2011**

**From: C and C Farms  
Richard Campbell  
PO Box 45  
Vendor, AR 72683  
870-434-5974**

**Please be aware that I am requesting that Phillip Campbell's Farm be included in my spreading acreage. This request is being made to A.D.E.Q in Little Rock, AR (phone number 501-682-0045).**

**The original permit application only allows spreading on my pastures located near my 320 head swine farm (located at T 15 N R 21W section 34) and other farms that are adjacent to Swine farm operation. Part of the liquid waste permit regulations require that I give notice to adjacent land owners when I request a permit modification to add acreage to my spreading acreage. Please contact myself Richard Campbell if you have any questions. Hopefully you will not have any objections to adding this acreage to my spread area that is designated in our liquid waste permit. Waste and liquid spreading on this acreage will be seasonal, not on a day to day basis.**

**Brief legal description of the location of the property: T 15 N R 20 W Section 28,29 and 33**

**Letters have been sent to or by personnel contact to the following individuals:**

**Mike Middleton  
Nancy Villines  
Doyle Royce**

**To: Adjacent Landowners**

**January 5, 2011**

**From: C and C Farms  
Richard Campbell  
PO Box 45  
Vendor, AR 72683  
870-434-5974**

**Please be aware that I am requesting that Richard Campbell's Farms be included in my spreading acreage. This request is being made to A.D.E.Q in Little Rock, AR (phone number 501-682-0045).**

**The original permit application only allows spreading on my pastures located near my 320 head swine farm (located at T 15 N R 21 W section 34) and other farms that are adjacent to Swine farm operation. Part of the liquid waste permit regulations require that I give notice to adjacent land owners when I request a permit modification to add acreage to my spreading acreage. Please contact myself Richard Campbell if you have any questions. Hopefully you will not have any objections to adding this acreage to my spread area that is designated in our liquid waste permit. Waste and liquid spreading on this acreage will be seasonal, not on a day to day basis.**

**Brief legal description of the location of the property: T 13 N R 20 W Section 28,29 and 33**

**Letters have been sent to or by personnel contact to the following individuals:**

**Bradley Middleton  
Tom Niswonger  
Carl Smith  
Nancy Villines  
Ellis Campbell**



**To: Adjacent Landowners**

**January 5, 2011**

**From: C and C Farms  
Richard Campbell  
PO Box 45  
Vendor, AR 72683  
870-434-5974**

**Please be aware that I am requesting that Lynn Carl Middleton Farm be included in my spreading acreage. This request is being made to A.D.E.Q in Little Rock, AR (phone number 501-682-0045).**

**The original permit application only allows spreading on my pastures located near my 320 head swine farm (located at T 15 N R 21W section 34) and other farms that are adjacent to Swine farm operation. Part of the liquid waste permit regulations require that I give notice to adjacent land owners when I request a permit modification to add acreage to my spreading acreage. Please contact myself Richard Campbell if you have any questions. Hopefully you will not have any objections to adding this acreage to my spread area that is designated in our liquid waste permit. Waste and liquid spreading on this acreage will be seasonal, not on a day to day basis.**

**Brief legal description of the location of the property: T 14 N R 21 W Sections 14, 22 & 23**

**Letters have been sent to or by personnel contact to the following individuals:**

**Stephen Word  
USFS  
Joe Cowell**

April 21, 2011

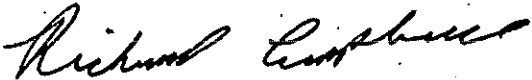
Arkansas Department of Health and Human Services  
Engineering Division, Slot #37  
4815 West Markham Avenue  
Little Rock, AR 72205

To Whom It May Concern,

I am making application to the Arkansas Department of Environmental Quality for a No-Discharge Water Pollution Control Permit Modification. I am operating an existing 312 sow farrowing swine operation. I am planning to modify my permit by adding additional land application sites to my permit.

Please find the attached map package showing the facility location and the waste application sites.

Sincerely,



Richard Campbell  
C and C Hog Barn

WARRANTY DEED  
WITH RELINQUISHMENT OF DOWERY & CURTESY

KNOW ALL MEN BY THESE PRESENTS:

THAT we, Harl W. Bohannon & Linda E. Bohannon, H&W and  
Tod A. Barnard & Melinda E. Barnard, H&W  
hereinafter called GRANTOR(S), for and in  
consideration of the sum of TEN DOLLARS, in hand paid  
by Richard E. Campbell & Mary L. Campbell, H&W the  
receipt of which is hereby acknowledged, do hereby grant  
bargain, sell and convey unto  
Richard E. Campbell & Mary L. Campbell, H&W

hereinafter called GRANTEE(S), and unto their heirs and  
assigns forever, the following lands lying in  
County, Arkansas, to-wit:

A part of the NE 1/4 of the SE 1/4 of S33, T15N, R21W, being all that part lying East of the County  
Road, containing 19 acres, more or less.

A part of the SW 1/4 of the NW 1/4 of S34, T15N, R21W, being all that part of said forty lying North  
of County Road as it now exists, containing 35 acres, more or less.

The NW 1/4 of the SW 1/4 of S34, T15N, R21W, containing 40 acres, more or less.

ALSO, part of the SW 1/4 of the NW 1/4 of S34, T15N, R21W, being all that  
part of said forty lying South of the County Road as it now exists, containing 3 acres, more or  
less.

To have and to hold the same unto the said GRANTEE(S), and unto their heirs and assigns  
forever, with all appurtenances thereunto belonging.

And we, Harl W. Bohannon & Linda E. Bohannon and Tod A. Barnard & Melinda E. Barnard hereby  
covenant with said GRANTEE(S) that we will forever warrant and defend the title to the said  
lands against all claims whatever.

And we, Harl W. Bohannon & Linda E. Bohannon and Tod A. Barnard & Melinda E. Barnard, in  
consideration of the sum of money, do hereby release and relinquish unto the said  
Richard E. Campbell & Mary L. Campbell GRANTEE(S) all our rights of dowery and curtesy and  
homestead in and to the said lands.

Witness our hands and seals on this 27 day of February, 2000

Harl W. Bohannon  
Harl W. Bohannon

Linda E. Bohannon  
Linda E. Bohannon

Tod A. Barnard  
Tod A. Barnard

Melinda E. Barnard  
Melinda E. Barnard

STATE OF Arkansas  
COUNTY OF Newton Pope

ACKNOWLEDGEMENT

SS.

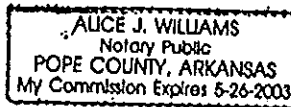
Be IT REMEMBERED, That on this day came before the undersigned, a notary public within and for  
the County aforesaid, duly commissioned and acting, Harl W. Bohannon & Linda E. Bohannon and Tod  
A. Barnard & Melinda E. Barnard and to me well known or proven as the Grantors in the foregoing  
Deed and stated that they had executed the same for the consideration and purposes therein and  
set forth.

Witness my and seal as such notary public this \_\_\_\_\_ day of \_\_\_\_\_

My Commission expires:

5-26-2003

Alice J. Williams  
NOTARY PUBLIC



FILED  
OFFICE OF THE CIRCUIT CLERK  
NEWTON COUNTY ARKANSAS  
FEB 28 2000 P.M.  
A.M. 2:35 P.M.  
BOOK 947 PAGE 204  
HUBERT ROBERSON  
I certify under penalty of false swearing that at  
least the legally correct amount of documentary  
stamps have been placed on this instrument.  
GRANTEE Richard Campbell  
ADDRESS P.O. Box 45  
Vendee, Ar 72683  
SEAL OF CIRCUIT COURT  
NEWTON COUNTY, ARKANSAS

665



**PRIORITY MAIL**

UNITED STATES POSTAL SERVICE®

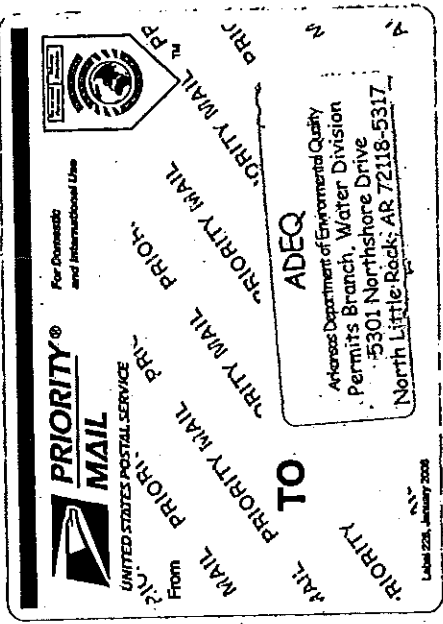
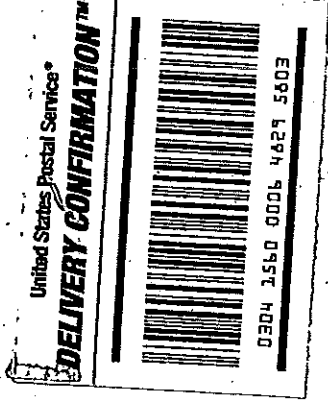
WWW.USPS.COM

72683-9998



POSTAGE WILL BE PAID BY ADDRESSEE  
DOMESTIC USE ONLY

Richard Campbell  
C & C Hog Barn  
P.O. Box 45  
Vendor, AR 72683



**HOW TO USE:**



**1. COMPLETE ADDRESS LABEL AREA**  
Type or print required return address and addressee information in customer block (white area) or on label (if provided).



**2. PAYMENT METHOD**  
Affix postage or meter stamp to area indicated in upper right hand corner.



**3. ATTACH LABEL (if provided)**  
Remove label backing and adhere over customer address block area (white area).

## SECTION 8 – CLOSURE PLAN

If this operation ceases to function for animal confinement and manure storage, it shall be closed as follows. Manure and wastewater will be agitated and pumped to the extent that conventional pumping will allow. Clean water shall be added, as necessary, to facilitate agitation and sludge removal. Remaining solids in the settling basins and holding pond shall be removed.

Wastewater conveyances from the animal storage facilities to the waste storage facilities shall be removed or capped to prevent additional waste streams entering the closed impoundments. The removed wastes shall be utilized in accordance with NRCS conservation practice standard, Nutrient Management (Code 590), and applied in accordance with the recommended application rates as indicated in this CNMP, Section 6.

**Land Reclamation.** Impoundments with embankments, when cleaned, may be breached such that they will no longer impound water. Excavated impoundments, when cleaned, may be backfilled so that these areas may be utilized for other purposes. Contact the Harrison NRCS Office before beginning the clean-out and closure of these structures. NRCS will provide plans for backfilling or conversion to fresh water impoundments for these structures. NRCS will also provide certification that these structures were cleaned out and reclaimed in accordance with NRCS specifications, as this is a condition of permit closure.

- **For Conversion to Fresh Water Impoundments:** NRCS will provide technical assistance to insure that the converted pond meets the NRCS Pond Specification (378). This will include side slope and spillway requirements.
- **For Backfilled Impoundments:** NRCS will calculate the volume of earthfill required to backfill the impoundment, including a 10% overfill for settling, and will provide a vegetation plan for all disturbed areas.

**Protection.** All disturbed areas shall be vegetated in accordance with the NRCS conservation practice standard, Critical Area Planting, Code 342.

**Ewing, Lonnie - FSA, Fayetteville, AR**

---

**From:** Lonadier, Margaret - NRCS, Harrison, AR  
**Sent:** Tuesday, August 21, 2012 2:24 PM  
**To:** Ewing, Lonnie - FSA, Fayetteville, AR  
**Subject:** RE: Closure Plan  
**Attachments:** Example Certifying Closure Letter.doc; Closure Certification Form.doc

Lonnie,

This closure is part Mr. Campbell's Comprehensive Nutrient Management Plan, which is based on the phosphorous index, and is all that is required to close out this facility.

If Mr. Campbell is wishing to backfill the cleaned out pond, he may do so whenever he is ready. Please keep in mind he will need to overfill to account for 15% shrinkage in the backfill material. If he chooses to convert to a fresh water pond, NRCS will need to design a spillway on the pond, usually dozer blade wide, to accommodate any overflow.

Upon completion of the closure, NRCS will make an inspection and complete the attached certification form, which Mr. Campbell will forward to ADEQ for release from his permit.

If you have any questions, please give me a call.

Margaret Lonadier  
District Conservationist  
Harrison FSC

---

**From:** Ewing, Lonnie - FSA, Fayetteville, AR  
**Sent:** Thursday, August 09, 2012 12:33 PM  
**To:** Lonadier, Margaret - NRCS, Harrison, AR  
**Subject:** FW: Closure Plan

*Emailed to Jason  
7-22-12  
farm will not close  
for over a year*

---

**From:** Jason Henson [<mailto:jasonh@rittermail.com>]  
**Sent:** Tuesday, August 07, 2012 11:58 AM  
**To:** Ewing, Lonnie - FSA, Fayetteville, AR  
**Subject:** Fwd: Closure Plan

Sent from my iPhone

Begin forwarded message:

**From:** Mary Campbell <[mlreacampbell@hotmail.com](mailto:mlreacampbell@hotmail.com)>  
**Date:** August 7, 2012 11:27:18 AM CDT

To: "JasonH@rittermail.com" <JasonH@rittermail.com>  
Subject: FW: Closure Plan

---

From: Adam.Clark2@ar.nacdnet.net  
To: mlrecampbell@hotmail.com  
Subject: Closure Plan  
Date: Tue, 7 Aug 2012 16:20:16 +0000

This came out of the Nutrient Management Plan that you have a copy of.

This electronic message contains information generated by the USDA solely for the intended recipients. Any unauthorized interception of this message or the use or disclosure of the information it contains may violate the law and subject the violator to civil or criminal penalties. If you believe you have received this message in error, please notify the sender and delete the email immediately.



Natural Resources Conservation Service  
P.O. Box 26  
Morrilton, AR 72110  
(501) 354-2000

---

ADEQ  
Attn. (*ADEQ Engineer you are working with*)  
8001 National Drive  
P.O.Box 8913  
Little Rock, AR 72219-8913

February 4, 2009

Dear XXXXXXXX:

This letter is certifying closure of the waste system on the Example Dairy, Owner Joe Blow, Permit No. AR123456 has been completed. The liquid and solid waste have been removed and spread on the pastureland underlined in the conditions of the permit and according to the Animal Waste Management Closure Plan.

The holding pond of the waste system has been completely cleaned out and converted to a fresh water pond meeting NRCS standards and specifications. The settling basin also has been successfully cleaned out in accordance with current permit requirements.

The surrounding areas are seeded for revegetation purposes over the disturbed area. There does not appear to be any problems existing at this location.

Respectfully,

District Conservationist  
Natural Resources Conservation Service  
P.O.Box 11111  
Somewhere, AR 77777

Cc: Joe Blow (Owner)  
Stan Rose, Area Engineer, USDA-NRCS





Natural Resources Conservation Service  
P.O. Box 26  
Morrilton, AR 72110  
(501) 354-2000

---

ADEQ  
Attn. (*ADEQ Engineer you are working with*)  
8001 National Drive  
P.O.Box 8913  
Little Rock, AR 72219-8913

February 4, 2009

Dear XXXXXXXX:

This letter is certifying closure of the waste system on the Example Dairy, Owner Joe Blow, Permit No. AR123456 has been completed. The liquid and solid waste have been removed and spread on the pastureland underlined in the conditions of the permit and according to the Animal Waste Management Closure Plan.

The holding pond of the waste system has been completely cleaned out and converted to a fresh water pond meeting NRCS standards and specifications. The settling basin also has been successfully cleaned out in accordance with current permit requirements.

The surrounding areas are seeded for revegetation purposes over the disturbed area. There does not appear to be any problems existing at this location.

Respectfully,

District Conservationist  
Natural Resources Conservation Service  
P.O.Box 11111  
Somewhere, AR 77777

Cc: Joe Blow (Owner)  
Stan Rose, Area Engineer, USDA-NRCS

**Ewing, Lonnie - FSA, Fayetteville, AR**

---

**From:** Ewing, Lonnie - FSA, Fayetteville, AR  
Wednesday, August 08, 2012 3:50 PM  
'Dan Benton'  
**Cc:** 'Jason Henson'

Guys,  
I need for Jason to verify with nracs that the closure plan in the cnmp is sufficient - we do not need any surprises.  
Also dan - I need you to certify that the customers have all the equip. necessary to close the existing facility.  
lde

**Ewing, Lonnie - FSA, Fayetteville, AR**

---

From: Dan Benton [Dan.Benton@farmcredit.com]  
Date: Thursday, August 09, 2012 10:09 AM  
Subject: Ewing, Lonnie - FSA, Fayetteville, AR  
RE:

Follow Up Flag: Follow up  
Flag Status: Flagged

They do have the necessary machinery or access to it. Jason's father-in-law has a backhoe and they have all the other equipment that would be required.

Dan Benton  
Assistant Vice President

870-741-2020

NMLS 695920

THE INFORMATION CONTAINED IN THIS EMAIL COMMUNICATION IS INTENDED ONLY FOR THE PERSONAL AND CONFIDENTIAL USE OF THE DESIGNATED RECIPIENT NAME ABOVE. The information contained in this message may be privileged and confidential and protected from disclosure. If the reader of this message is not the intended recipient, you are hereby notified that you have received this communication in error, and that any review, dissemination, distribution or copying of this message is strictly prohibited. If you have received this transmission in error, please destroy it immediately and notify us by reply email, or at 870-741-2020.

-----Original Message-----

From: Ewing, Lonnie - FSA, Fayetteville, AR [mailto:Lonnie.Ewing@ar.usda.gov]  
Sent: Wednesday, August 08, 2012 3:50 PM  
To: Dan Benton  
Cc: Jason Henson  
Subject:

Guys,  
I need for Jason to verify with nracs that the closure plan in the cnmp is sufficient - we do not need any surprises.  
Also dan - I need you to certify that the customers have all the equip. necessary to close the existing facility.  
lde

This electronic message contains information generated by the USDA solely for the intended recipients. Any unauthorized interception of this message or the use or disclosure of the information it contains may violate the law and subject the violator to civil or criminal penalties. If you believe you have received this message in error, please notify the sender and delete the email immediately.

# ADEQ

ARKANSAS  
Department of Environmental Quality

August 13, 2012

Mr. Jason Henson  
C & H Hog Farms, Inc.  
He 72 PO Box 10  
Mount Judea, AR 72655

RE: NPDES Stormwater Construction General Permit, C & H Hog Farms, Mount Judea, AR  
Permit Tracking No. ARR153893 AFIN 51-00164

Dear Mr. Henson:

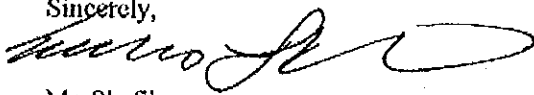
The initial permit fee and Notice of Intent (NOI) for coverage under Stormwater Construction General Permit ARR150000 were deemed complete on 8/7/2012. For tracking purposes, the project has been assigned permit tracking number, ARR153893 and AFIN 51-00164. Please use these numbers in all future correspondence related to this construction project.

The Stormwater Pollution Prevention Plan (SWPPP) has been reviewed and all elements required by the SWPPP checklist were included. Please note that review of the SWPPP does not constitute approval. The permittee must comply with all the requirements of the Stormwater Construction General Permit ARR150000. Additionally, the permittee may modify the SWPPP as necessary to protect the Waters of the State from erosion and/or sediment runoff.

Based upon the information submitted in the NOI and SWPPP, this permit tracking number only applies to the acreage that was originally reviewed by the Department. If additional acreage is required, a revised site map containing the additional acreage and meeting all the permit requirements set forth in Part II.A.4.F of the Construction Stormwater General Permit must be submitted to the Department for review prior to any construction activity taking place on the requested acreage. Please note that review of the SWPPP in no way guarantees satisfactory operation of the tools and techniques proposed in the Plan. The permittee is responsible for ensuring that water quality standards are not violated and that off-site impacts (e.g., off-site vehicle tracking) do not occur.

Please find enclosed for your use: the Notice of Coverage, a copy of the Stormwater Construction General Permit, and a Notice of Termination (NOT). If you have any questions concerning this matter or need additional information, please feel free to contact Katherine Yarberry, General Permits Engineer at (501) 682-0627 or myself at (501) 682-0616.

Sincerely,



Mo Shafii  
Assistant Chief, Water Division

MS: kay

Attachment

cc: Electronic Filing (ARR153893, w/ attachments)  
Craig Uyeda, Branch Manager, Enforcement Branch  
Eric Fleming, Branch Manager, Field Services Branch  
Jim Purvis, Administrative Analyst, Fiscal Division  
David Ramsey, ICIS Program Coordinator, Enforcement Branch

ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY

5301 NORTHSHORE DRIVE / NORTH LITTLE ROCK / ARKANSAS 72118-5317 / TELEPHONE 501-682-0744 / FAX 501-682-0880

www.adeq.state.ar.us

Tracking Permit number: ARR153893  
AFIN: 51-00164

**AUTHORIZATION LETTER TO DISCHARGE STORMWATER UNDER  
THE NPDES STORMWATER CONSTRUCTION GENERAL PERMIT NUMBER ARR150000.**

***THIS IS THE NOTICE OF COVERAGE UNDER GENERAL PERMIT ARR150000***

The stormwater discharge shall be in accordance with all monitoring requirements and other conditions set forth in the NPDES Stormwater Construction General Permit ARR150000.

C & H Hog Farms, Inc.  
Hc 72 PO Box 10  
Mount Judea, AR 72655

is authorized to discharge stormwater from a facility located as follows:

C & H Hog Farms  
On CR 276, 0.5 miles west of intersection of CR 41 & CR 276; West of Mount Judea, AR  
Mount Judea in Newton County, Arkansas

Coverage under this permit is for swine barns. In accordance with the NOI there will be only 8.20 acres disturbed out of 8.20 acres total. This permit allows only disturbance for the 8.20 acres identified in the submitted and reviewed SWPPP and site map. If additional acreage is going to be disturbed, a new site map indicating the new disturbed area and all requirements of the site map set forth in Part II.A.4.F of the Construction Stormwater General Permit, ARR150000, must be submitted to the Department prior to any activity taking place on the additional acreage.

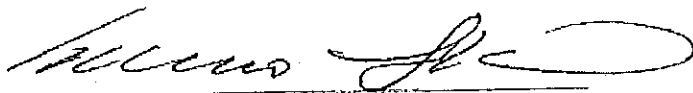
The Stormwater Pollution Prevention Plan will be located in the construction trailer.

The Project Contact Person for this construction site is Jason Henson, 870-715-9468.

This authorization must be **posted** at the construction site in a prominent place per the general permit.

Issued date: 08/13/2012

Expiration date: 10/31/2016



Mo Shafiq  
Assistant Chief, Water Division  
Arkansas Department of Environmental Quality

# ADEQ

ARKANSAS  
Department of Environmental Quality

August 13, 2012

Mr. Jason Henson  
C & H Hog Farms, Inc.  
He 72 PO Box 10  
Mount Judea, AR 72655

RE: NPDES Stormwater Construction General Permit, C & H Hog Farms, Mount Judea, AR  
Permit Tracking No. ARR153893 AFIN 51-00164

Dear Mr. Henson:


The initial permit fee and Notice of Intent (NOI) for coverage under Stormwater Construction General Permit ARR150000 were deemed complete on 8/7/2012. For tracking purposes, the project has been assigned permit tracking number, ARR153893 and AFIN 51-00164. Please use these numbers in all future correspondence related to this construction project.

The Stormwater Pollution Prevention Plan (SWPPP) has been reviewed and all elements required by the SWPPP checklist were included. Please note that review of the SWPPP does not constitute approval. The permittee must comply with all the requirements of the Stormwater Construction General Permit ARR150000. Additionally, the permittee may modify the SWPPP as necessary to protect the Waters of the State from erosion and/or sediment runoff.

Based upon the information submitted in the NOI and SWPPP, this permit tracking number only applies to the acreage that was originally reviewed by the Department. If additional acreage is required, a revised site map containing the additional acreage and meeting all the permit requirements set forth in Part II.A.4.F of the Construction Stormwater General Permit must be submitted to the Department for review prior to any construction activity taking place on the requested acreage. Please note that review of the SWPPP in no way guarantees satisfactory operation of the tools and techniques proposed in the Plan. The permittee is responsible for ensuring that water quality standards are not violated and that off-site impacts (e.g., off-site vehicle tracking) do not occur.

Please find enclosed for your use: the Notice of Coverage, a copy of the Stormwater Construction General Permit, and a Notice of Termination (NOT). If you have any questions concerning this matter or need additional information, please feel free to contact Katherine Yarberr, General Permits Engineer at (501) 682-0627 or myself at (501) 682-0616.

Sincerely,

  
Mo Shafiq  
Assistant Chief, Water Division

MS: kay

Attachment

cc: Electronic Filing (ARR153893, w/ attachments)  
Craig Uyeda, Branch Manager, Enforcement Branch  
Eric Fleming, Branch Manager, Field Services Branch  
Jim Purvis, Administrative Analyst, Fiscal Division  
David Ramsey, ICIS Program Coordinator, Enforcement Branch

Tracking Permit number: ARR153893  
AFIN: 51-00164

**AUTHORIZATION LETTER TO DISCHARGE STORMWATER UNDER  
THE NPDES STORMWATER CONSTRUCTION GENERAL PERMIT NUMBER ARR150000.**

***THIS IS THE NOTICE OF COVERAGE UNDER GENERAL PERMIT ARR150000***

The stormwater discharge shall be in accordance with all monitoring requirements and other conditions set forth in the NPDES Stormwater Construction General Permit ARR150000.

C & H Hog Farms, Inc.  
Hc 72 PO Box 10  
Mount Judea, AR 72655

is authorized to discharge stormwater from a facility located as follows:

C & H Hog Farms  
On CR 276, 0.5 miles west of intersection of CR 41 & CR 276; West of Mount Judea, AR  
Mount Judea in Newton County, Arkansas

Coverage under this permit is for swine barns. In accordance with the NOI there will be only 8.20 acres disturbed out of 8.20 acres total. This permit allows only disturbance for the 8.20 acres identified in the submitted and reviewed SWPPP and site map. If additional acreage is going to be disturbed, a new site map indicating the new disturbed area and all requirements of the site map set forth in Part II.A.4.1 of the Construction Stormwater General Permit, ARR150000, must be submitted to the Department prior to any activity taking place on the additional acreage.

The Stormwater Pollution Prevention Plan will be located in the construction trailer.

The Project Contact Person for this construction site is Jason Henson, 870-715-9468.

This authorization must be **posted** at the construction site in a prominent place per the general permit.

Issued date: 08/13/2012

Expiration date: 10/31/2016



Mo Shalji  
Assistant Chief, Water Division  
Arkansas Department of Environmental Quality

# ADEQ

ARKANSAS  
Department of Environmental Quality

7412613

CERTIFIED MAIL RETURN RECEIPT REQUESTED: (91 7199 9991 7030 4904 6144)

March 16, 2012

Richard E. Campbell  
C & C Hog Barn  
P.O. Box 45  
Vendor, AR 72683

RE: Minor Modification; AFIN No. 51-00020; Permit No.3540-WR-5

Dear Mr. Campbell:

The Department received a request for a minor modification for the above referenced facility on 5/17/2011. The permit is being modified to incorporate the following changes:


1. Update of the Comprehensive Nutrient Management Plan to be consistent with the Natural Resources Conservation Service requirements.
2. Added an additional 481.6 acres of land application area.
3. Requirements of the permit have been revised to comply with the most recent version of APC&FC Regulation 5.

The proposed addition of the Harl Bahannon field HB3 was removed based on a letter received on May 24, 2011 from the Arkansas Department of Health which stated that the drainage from this field could potentially contaminate the Deer Water Association well fields. All other proposed land application additions were incorporated into this permit.

The enclosed updated Permit Conditions and Statement of Basis reflect these changes

If you have any questions, please contact Sarah Cousins of my staff at (501) 682-0653 or by email at [cousins@adeq.state.ar.us](mailto:cousins@adeq.state.ar.us).

Sincerely,



Steven L. Drown  
Chief, Water Division

Enclosures

cc: Craig Uyeda, Enforcement Branch Manager, Water Division  
Eric Fleming, Inspection Branch Manager, Water Division  
file (AFIN No. 51-00020; Permit No. 3540-WR-5)

Existing



**AUTHORIZATION FOR A NO-DISCHARGE WATER PERMIT UNDER THE  
ARKANSAS WATER AND AIR POLLUTION CONTROL ACT**

In accordance with the provisions of the Arkansas Water and Air Pollution Control Act  
(Ark. Code Ann. § 8-4-101 *et. seq.*)

**Richard E. Campbell  
C & C Hog Barn  
P.O. Box 45  
Vendor, AR 72683**

is authorized to store and land apply liquid waste for a Swine facility located in Newton County,  
Arkansas at the following coordinates:

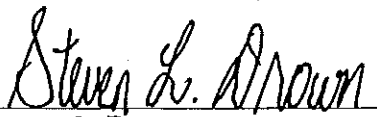
Latitude: 35° 54' 43" N Longitude: 93° 12' 9" W

The facility is located 2,035 feet from Shop Creek-East Fork in Stream Segment 4J of the White  
River basin.

Operation shall be in accordance with all conditions set forth in the permit.

Effective Date: April 1, 2012

Expiration Date: N/A

  
\_\_\_\_\_  
Steven L. Drown  
Chief, Water Division  
Arkansas Department of Environmental Quality

20 MARCH 12  
Issue Date:

**Part I  
 Monitoring Requirements**

The following tables detail the monitoring frequencies and the requirements for reporting results to the ADEQ for each respective parameter listed in the table heading.

TABLE I		
Waste Analysis		
Parameter	Limit (Reporting Units)	Monitoring Frequency
pH	Report (S.U.)	Once per calendar year (January - December)
Percent Solids	Report (Percentage (%))	
Total Phosphorus	Report (mg/L)	
Soluble Phosphorus		
Total Nitrogen		
Potassium		

TABLE II		
Soils		
Parameter	Limit (Reporting Units)	Monitoring Frequency
pH	Report (S.U.)	Once every five (5) years from the effective date of the permit
Phosphorus	Report (mg/L)	
Potassium		
Nitrates		

**Part II**  
**Specific Conditions**

1. This permit is for the storage and land application of liquid manure and is subject to Arkansas Pollution Control and Ecology Commission (APC&EC) Regulation No. 5 in its entirety.
2. Waste shall not be discharged from this operation to the waters of the State or onto the land in any manner that may result in ponding or runoff to the waters of the State. [Reg. 5.303]
3. No liquid animal waste management system shall be constructed, modified, or placed into operation unless in accordance with final design plans and specifications approved by the Department. [Reg. 5.401]
4. Land application rates shall not exceed the rates discussed in the February 2011 Comprehensive Nutrient Management Plan (CNMP). The CNMP submitted for the waste disposal operation is hereby incorporated into this permit by reference. As a result, all provisions and information contained in this document become enforceable conditions of this permit. If the CNMP is inconsistent with this permit, the waste disposal system shall be operated in accordance with the terms of the permit and the CNMP shall be revised to conform to the permit conditions.
5. The permittee shall determine if the land application sites are listed in the CNMP are currently permitted or used by another user. In the event that the Department determines that any land application site under this permit is permitted for land application under another Water Division Permit, the Department may void this permit or enforcement action may be taken.
6. Unless otherwise specified, methods and timing of sampling and analysis described in this permit must be in accordance with the University of Arkansas Cooperative Extension Service guidelines. [Reg. 5.407(D)]
7. All land applied waste must be on the land application sites listed in the CNMP. Any other land application sites that are not listed in the CNMP even if listed in the application or other documents are prohibited [Reg. 5.601].
8. Waste shall not be land applied where land application is prohibited by Arkansas Department of Health regulations for the protection of public water supplies. [Reg. 5.406(F)]
9. The permittee will be responsible for assuring that the landowners of all waste application sites and the waste applicators abide by the conditions of this permit. [Reg. 5.405 (B)]
10. Animal mortality shall be disposed of in accordance with the approved CNMP. [Reg. 5.402 (A)]
11. The permittee must take all reasonable and necessary measures to minimize obnoxious and offensive odors in accordance with the recommendations in the CNMP. [Reg. 5.405(A)]
12. Waste storage basin liners must be maintained in accordance with the NRCS Field Office Technical Guide and the CNMP. [Reg. 5.402]
13. Waste must be evenly distributed over the application sites. [Reg. 5.406(A)]

14. Waste must not be land applied when the soil is saturated; frozen or covered with ice or snow; when significant precipitation is reasonably anticipated in the next 24 hours; or during a precipitation event. [Reg. 5.406(B)]
15. Waste must not be applied on slopes with a grade of more than 15% or in any manner that will allow waste to enter the waters of the State or to run onto adjacent property. [Reg. 5.406(C)]
16. Waste must not be land applied within 100 feet of streams including intermittent streams, ponds, lakes, springs, sinkholes, rock outcrops, wells and water supplies; or 300 feet of extraordinary resource waters as defined by the Department's Regulation No. 2. Buffer distances for streams, ponds and lakes must be measured from the ordinary high water mark. [Reg. 5.406(D)]
17. Waste must not be land applied within 50 feet of property lines or 500 feet of neighboring occupied buildings existing as of the date of the permit. The restrictions regarding property lines or neighboring buildings may be waived if the adjoining property is also approved as a land application site under a permit issued by the Department or if the adjoining property owner consents in writing. [Reg. 5.406(E)]
18. Annual reports for the previous year (i.e. Annual report is due on May 30, 2012 for the 2011 calendar year) must be submitted to the Department prior to May 30 of each year and must include the following: waste and soils analyses as described in Part I; and the location (land application sites), volume of waste applied, nitrogen application rate, method of waste application and type of crop(s) grown for each waste application site. Reports must be submitted on forms provided by the Department. [Reg. 5.407(E)]
19. Records must be kept of all land applied waste and must include, at a minimum, the following: date of application; weight and/or volume applied; waste destination; and number of acres over which the waste was applied. All records and logs shall be kept at the facility and provided to the Department upon request. [Reg. 5.407(A)]
20. Should the facility covered by this permit cease operations, the permittee must submit to the Department, for approval, a closure plan for the waste storage/treatment structure(s) within sixty (60) days of the final day of operation for Department review and approval. Within ten (10) days of completion of closure activities, the permittee must submit certification that the facility was closed in accordance with the approved plan. [Reg. 5.701(A)]
21. An updated CNMP shall be submitted to ADEQ when changes are made or as required by ADEQ. [Reg. 5.405(C)]

**Part III**  
**Standard Conditions**

**I. Duty to Comply**

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Arkansas Water and Air Pollution Control Act, Ark. Code Ann. §8-4-101 et seq. and is grounds for civil and administrative enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

**2. Penalties for Violations of Permit Conditions**

The Arkansas Water and Air Pollution Control Act, Ark. Code Ann. 8-4-101 et seq. provides that any person who violates any provisions of a permit issued under the Act shall be guilty of a misdemeanor and upon conviction thereof shall be subject to imprisonment for not more than one (1) year, or a fine of not more than twenty-five thousand dollars (\$25,000) or both for each day of such violation. Any person who violates any provision of a permit issued under the Act may also be subject to a civil penalty not to exceed ten thousand dollars (\$10,000) for each day of such violation. The fact that any such violation may constitute a misdemeanor shall not be a bar to the maintenance of such civil action.

**3. Permit Actions**

A. This permit may be modified, revoked and reissued, or terminated for cause including, but not limited to the following:

- i. Violation of any terms or conditions of this permit;
- ii. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts;
- iii. A determination that the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by permit modification or termination; or
- iv. Failure of the permittee to comply with the provisions of Arkansas Pollution Control and Ecology Commission (APC&EC) Regulation No. 9 (Permit fees).

B. The filing of a request by the permittee for a permit modification, revocation and reissuance, termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

**4. Civil and Criminal Liability**

Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance. Any false or materially misleading representation or concealment of information required to be reported by the provisions of this permit or applicable state statutes or regulations which defeats the regulatory purposes of the permit may subject the permittee to criminal enforcement pursuant to the Arkansas Water and Air Pollution Control Act, Ark. Code Ann. §8-4-101 et seq.

5. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Clean Water Act and Section 106 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

6. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation.

7. Property Rights

The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

8. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provisions of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

9. Permit Fees

The permittee shall comply with all applicable permit fee requirements for no-discharge permits as described in APC&EC Regulation No. 9 (Regulation for the Fee System for Environmental Permits). Failure to promptly remit all required fees shall be grounds for the Director to initiate action to revoke this permit.

10. Proper Operation and Maintenance

- A. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.
- B. The permittee shall provide an adequate and trained operating staff which is duly qualified to carry out operation, maintenance and testing functions required to insure compliance with the conditions of this permit.

11. Duty to Mitigate

The permittee shall take all reasonable steps to prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health, the environment, or the water receiving the discharge.

12. Removed Substances

Solids removed in the course of treatment or control of waste shall be disposed of in a manner such as to prevent any pollutant from such materials from entering the waters of the State.

13. Reporting of Violations and Unauthorized Discharges

- A. Any violations to this permit must be reported to the Enforcement Branch of the Department immediately. Any leaks or seeps shall be reported to the Department and appropriately corrected. Any discharge from the storage system such as an overflow, a broken pipe, etc., shall be immediately reported to the Department.
- B. The operator shall visually monitor and report immediately (within 24 hours) to the Enforcement Branch any unauthorized discharge from any facility caused by dike or structural failure, equipment breakdown, human error, etc., and shall follow up with a written report within five (5) days of such occurrence. The written report shall contain the following:
- i. A description of the permit violation and its cause;
  - ii. The period of the violation, including exact times and dates;
  - iii. If the violation has not been corrected, the anticipated time expected to correct the violation; and
  - iv. Steps taken or planned to reduce, eliminate, and prevent the recurrence of the violation.
- C. Reports shall be submitted to the Enforcement Branch at the following address:

Arkansas Department of Environmental Quality  
Water Division, Enforcement Branch  
5301 Northshore Dr.  
North Little Rock, Arkansas 72118  
Fax (501) 682-0910

Or by email to:

[Water-Enforcement-Report@adeq.state.ar.us](mailto:Water-Enforcement-Report@adeq.state.ar.us)

14. Penalties for Tampering

The Arkansas Water and Air Pollution Control Act, Ark. Code Ann. § 8-4-101 et seq. provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under the Act shall be guilty of a misdemeanor and upon conviction thereof shall be subject to imprisonment for not more than one (1) year or a fine of not more than ten thousand dollars (\$10,000) or by both such fine and imprisonment.

15. Inspection and Entry

The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

- A. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
- B. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- C. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit,
- D. Sample, inspect, or monitor at reasonable times, for the purposes of assuring permit compliance any substances or parameters at any location.

16. Planned Changes

The permittee shall give notice and provide the necessary information to the Director for review and approval prior to any planned physical alterations or additions to the permitted facility.

17. Anticipated Noncompliance

The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

18. Transfers

The permit is nontransferable to any person except after notice to the Director. The Director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Act.

19. Duty to Provide Information

The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying; revoking and reissuing or terminating this permit; or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit. Information shall be submitted in the form, manner and time frame requested by the Director.

20. Signatory Requirements

- A. All applications, reports or information submitted to the Director shall be signed and certified. All permit applications shall be signed as follows:
  - i. For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:
    - a. A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or



- b. The manager of one or more manufacturing, production, or operation facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including: having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
  - ii. For a partnership or sole proprietorship: by a general partner or proprietor, respectively; or
  - iii. For a municipality, State, Federal, or other public agency; by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:
    - a. The chief executive officer of the agency, or
    - b. A senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.
- B. All reports required by the permit and other information requested by the Director shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
- i. The authorization is made in writing by a person described above.
  - ii. The authorization specified either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
  - iii. The written authorization is submitted to the Director.
- C. Any person signing a document under this section shall make the following certification: "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

**21. Availability of Reports**

Except for data determined to be confidential under the Arkansas Trade Secrets Act, Ark. Code Ann. § 4-75-601 et seq., all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Department of Environmental Quality. As required by the Regulations, the name and address of any permit applicant or permittee, permit applications, permits, and effluent data shall not be considered confidential.

22. Penalties for Falsification of Reports

The Arkansas Air and Water Pollution Control Act provides that any person who knowingly makes any false statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained under this permit shall be subject to civil penalties and/or criminal penalties under the authority of the Arkansas Water and Air Pollution Control Act, Ark. Code Ann. § 8-4-101 et seq.

23. Applicable Federal, State, or Local Requirements

Permittees are responsible for compliance with all applicable terms and conditions of this permit. Receipt of this permit does not relieve any operator of the responsibility to comply with any other applicable Federal, State, or local statute, ordinance policy, or regulation.

Part IV  
Definitions

**"Act"** means the Arkansas Water and Air Pollution Control Act (Ark. Code Ann. § 8-4-101 et. seq.) as amended.

**"APC&EC"** means the Arkansas Pollution Control and Ecology Commission.

**"Available Acreage"** means total acreage minus buffer zones

**"Confined Animal Operation"** means any lot or facility where livestock, fowl, or other animals have been, are or will be stabled or confined and fed or maintained and where crops, vegetation, forage growth or post-harvest residues are not sustained in the normal growing season over significant portions of the lot or facility.

**"Comprehensive Nutrient Management Plan (CNMP)"** is a conservation plan for animal feeding operation (AFO), consisting of a group of conservation practices and management activities and is site-specific for the farm.

**"Department"** means the Arkansas Department of Environmental Quality (ADEQ).

**"Director"** means the Director of the Arkansas Department of Environmental Quality.

**"Liquid Animal Waste Management System"** means any system used for the collection storage, distribution or disposal of animal waste in liquid form generated by a confined animal operation.

**"NRCS"** means the Natural Resources Conservation Service

**"s.u."** means standard units.

**"Waters of the State"** means all streams, lakes, marshes, ponds, watercourses, waterways, wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface and underground, natural or artificial, public or private, which are contained within, flow through, or border upon this state or any portion of this state as defined by the Act.

## STATEMENT OF BASIS

This Statement of Basis is for information and justification of the permit monitoring requirements as well as other conditions in the permit only and is not enforceable. This permit decision is for modification of a no-discharge operation under permit number 3540-WR-5 and AFIN 51-00020.

### 1. Permitting Authority

Arkansas Department of Environmental Quality  
Water Division, Permits Branch  
5301 Northshore Dr.  
North Little Rock, Arkansas 72118-5317

### 2. Applicant

Richard E. Campbell  
C & C Hog Barn  
P.O. Box 45  
Vendor, AR 72683

### 3. Permit History/ Activity

1. Permit No. 3540-W was issued to Jimmie Lee McCutcheon and effective 10/18/1987 for a sow farrowing facility.
2. Permit No. 3540-WR-1 was not issued.
3. Permit No. 3540-WR-2 was issued to Harl Bohannon dba Bohannon Farm and effective 04/21/1998 for a sow farrowing facility.
4. Permit No. 3540-WR-3 was issued to Harl Bohannon dba Bohannon-Barnard Farm and effective 01/29/1999 for a sow farrowing facility.
5. Permit No. 3540-WR-4 was issued to Richard E. Campbell dba C & C Hog Barn and effective 05/23/2000 for a sow farrowing facility.

The permittee submitted a permit modification application which was received on 5/17/2011. The facility is adding additional land application sites without increasing the waste volume which is a minor modification in accordance with APC&EC Regulation 5.306(D). In addition, the facility is updating the CNMP which includes a P-index and would be considered a minor modification in accordance with APC&EC Regulation 5.306(F).

### 4. Changes from Previous Permit

1. Update of the Comprehensive Nutrient Management Plan to be consistent with Natural Resources Conservation Service requirements.
2. Added an additional 481.6 acres of land application area.
3. Requirements of the permit have been revised to comply with the most recent version of APC&EC Regulation 5.

The proposed addition of the Harl Bahannon field HB3 was removed based on a letter received on May 24, 2011 from the Arkansas Department of Health which stated that the drainage from this field could potentially contaminate the Deer Water Association well fields. All other proposed land application additions were incorporated into this permit.

5. Facility Location

The facility is located as follows: Approx. 2 miles north of Hwy. 16/Hwy. 7 intersection on Smith Mountain Rd. near the community of Deer in Newton County, Arkansas. The facility is located at the following coordinates:

Latitude: 35° 54' 43" N Longitude: 93° 12' 9" W

6. Receiving Stream Location

The facility is located 2,035 feet from Shop Creek-East Fork in Stream Segment 4J of the White River basin, which is not listed in the 2008 ADEQ 303(d) list of impaired streams of the State of Arkansas.

7. Applicant Activity

Under the standard industrial classification (SIC) code 0213 or North American Industry Classification System (NAICS) code 11221, the applicant's activities are the operation of Swine 312 sow/200 pig swine facility.

8. Facility Type and Size

This facility operates as a sow-farrowing facility. The facility will house 312 sows, 4 boars, and 300 weaner pigs.

9. Waste Storage/Treatment Component(s)

The swine farm utilizes 3 houses to confine 312 sows (260 gestating sows with an average weight of 400 lbs and 52 lactating sows with an average weight of 375 lbs), 4 boars with an average weight of 450 pounds, and 300 weaner pigs with an average weight of 8 pounds. The waste will be washed into the end of each house then piped via an 8 inch PVC pipe into the sediment basin.

The waste system is designed with a holding pond and sediment basin. The sediment basin and holding pond are designed to provide 90 and 120 days, respectively, of storage of manure production, wash water, and rainfall from a 25 year, 24 hour storm event (6.9 inches per 24 hours). All rainfall runoff is diverted away from the waste storage structures.

The sediment basin has an operational storage volume of 37,600 gallons. The basin will have a minimum freeboard of 1 foot.

The holding pond has an operational storage volume of 175,515 gallons. The pond will have at least a 19 inch freeboard under normal conditions which may be reduced to a minimum of 1 foot in the event of a 25 year 24 hour storm. Staff gages are in the pond marking the 19 inch freeboard.

The sediment basin and holding pond liner was constructed from on-site clay material.

10. Washwater Source

Recycled water will be used to flush the waste from the barns.

11. Waste Application Method

The liquid waste will be evenly spread over the land application sites using a liquid manure spreader truck or an irrigation system.

12. Amount of Waste Produced by Farm

478,000 gallons per year

13. Total Available Acreage

606.6 acres are available for land application. According to the CNMP, the land application sites can receive 6.6 million gallons per year of waste based on the Phosphorus Index. Adequate acreage exists to land apply all the waste produced from the facility.

14. Basis for Permit Conditions

The Arkansas Department of Environmental Quality has made the determination to issue a permit for the no-discharge facility as described in the application and the CNMP. Permit requirements and conditions are based on regulations pursuant to the Arkansas Water and Air Pollution Control Act (Ark. Code Ann. § 8-4-101 et. seq. and Ark. Code Ann. § 8-4-201 et. seq.), Arkansas Pollution Control and Ecology Commission (APC&EC) Regulation 5 and generally accepted scientific knowledge and engineering practices (Ark. Code Ann. § 8-4-203(e)(2)(B)(i)).

Part I - Waste and Soil Analysis and Reporting

Analysis and reporting requirements in Table I and Table II of Part I of the permit are based on the APC&EC Regulation No. 5. The waste parameters listed in Table I shall be sampled and analyzed at a minimum of once a year based on Reg. 5.407(B). The soil, of each field where waste will be applied, parameters listed in Table II shall be sampled and analyzed at least once every five (5) years based on Reg. 5.407(C).

Part II - Specific Conditions

All conditions in Part II are based on the APC&EC Regulation No. 5. At the end of each condition, the appropriate APC&EC Regulation No. 5 is cited. However, Condition No. 5 was added to the permit because an application site covered in more than one permit is at risk of over application of nutrients. This condition encourages the applicant to confirm with the landowner that the site is not currently covered under another active permit before permitting the site.

Condition No. 2 prohibits any discharge from this facility. If the facility has any discharge then the facility must apply for a National Pollutant Discharge Elimination System (NPDES) General Permit ARG590000.

Part III - Standard Conditions

Standard Conditions have been included in this permit based on NPDES General Permit ARG590000 (Part 6-9).

Part IV - Definitions

All definitions in Part IV of the permit are self-explanatory.

**15. Prepared By**

For additional information, contact the permit writer at:

Sarah Cousins  
Engineer  
Permits Branch, Water Division  
5301 Northshore Drive  
North Little Rock, AR 72118-5317  
501-682-0653  
E-mail: cousins@adeq.state.ar.us

**16. Sources**

The following Sources were used to draft the permit:

1. APC&EC Regulation No. 8, Administrative Procedures, as amended.
2. APC&EC Regulation No. 9, Fee System for Environmental Permits, as amended.
3. APC&EC Regulation No. 5, Liquid Animal Waste Management Systems, as amended.
4. NPDES General Permit ARG590000, Concentrated Animal Feeding Operations (CAFO).
5. Integrated Water Quality and Assessment Report (305(b) Report).
6. Arkansas Water and Air Pollution Control Act, Ark. Code Ann. §8-4-101 et seq.
7. Arkansas Trade Secrets Act, Ark. Code Ann. § 4-75-601 et seq.
8. Application No. 3540-WR-5 received 5/17/2011.
9. CNMP received 05/17/2011

## Permit Data System Specific SPB Water Permit Details

[Close this window](#) [Print this page](#) [Details for Permit Number](#)

*Note: Click on the AFIN number for Facility Details*

AFIN	Facility Name	City	County
<a href="#">51-00020</a>	CAMPBELL,RICHARD/C&C HOG	DEER	NEWTON

[View Permit](#)

[View Applications](#)

[View Letters](#)

[View Technical](#)

[View Permit History \(Construction, Modifications, & Discharge\)](#)

### Details for Permit Number: 3540-WR-5

**Media Code:** WS - Water-SPB  
**Permit Status Code:** A - Active  
**Permit Type Code:** A - Ag (0213, 0219, 0241, 0252)  
**Permit Staff Code:** SC - COUSINS, SARAH

**Contact Name:**  
**Phone:**  
**Fax:**  
**E-mail:**  
**Mailing Address:**

**Approval Date:** 3/20/2012  
**Modified:**  
**Expires:**  
**Void:**  
**Pmt History:**

**Prior Pmt Number:** 3540-WR-4  
**Other Identifier:**

**Primary SIC Code:** 0213 - HOGS  
**Sec. SIC Code:**  
**Tert. SIC Code:**

**Primary NAICS Code:** 11221 - Hog and Pig Farming  
**Sec. NAICS Code:**  
**Tert. NAICS Code:**

**Lat. Deg/Min/Sec:** 35° 54' 43"  
**Long. Deg/Min/Sec:** -93° 12' 9"  
**Decimal Latitude:** 35.911944  
**Decimal Longitude:** -93.2025  
**UTM Northing:** 3974200.77  
**UTM Easting:** 481728.88  
**UTM Zone:** 15  
**Date Measured:**



<b>Current Datum:</b>	NAD83
<b>Source Name:</b>	Submitted by permittee
<b>GIS Comment:</b>	

[back to top](#)

[Close this window](#) [Print this page](#)

# ADEQ

ARKANSAS  
Department of Environmental Quality

AUG 03 2012

Jason Henson  
C & H Hog Farms  
Hc 72 PO Box 10  
Mount Judea, AR 72655

Re: Concentrated Animal Feeding Operations General Permit  
(Tracking Number ARG590001 – AFIN 51-00164)

Dear Mr. Henson:

The Notice of Intent (NOI) package for coverage under the General Permit No. ARG590000, for a concentrated animal feeding operation, was received on 6/25/2012. In accordance with Department policy, the NOI has been reviewed and has been determined to be complete. Coverage under this general permit will be effective the date of this letter. A copy of the General Permit ARG590000 is available from the Department or at the website below.

[http://www.adeq.state.ar.us/water/branch\\_permits/individual\\_permits/pdfs/forms/arg590000\\_draft.pdf](http://www.adeq.state.ar.us/water/branch_permits/individual_permits/pdfs/forms/arg590000_draft.pdf)

The NOC is for informational use only and if any information provided on the NOC is incorrect please notify the Department immediately so that our records may be corrected.

The Department requests that you read and familiarize yourself with the terms and conditions of the permit. Compliance with all conditions and limitations therein is required. Any permit-related correspondence must include the Tracking Number shown above.

Please be advised that any discharge of pollutants from a manure or wastewater storage structure, whether or not authorized by this permit, shall be sampled and analyzed for the parameters listed in Part 2.3.1 of the general permit. If a discharge occurs, you must notify ADEQ Water Enforcement Division within thirty (30) days of the discharge. In accordance with Part 3.2.4.6, all Discharge Monitoring Reports (DMR) shall be submitted with the annual report by the 31<sup>st</sup> of January each year. The Department will send you blank DMR forms for the remainder of the year and then a one year supply annually. In the event that the facility does not discharge during a given month, the DMR will still be required to be submitted with "No-Discharge" noted on the DMR form.

Thank you for your cooperation in this matter. Please contact the General Permits Section of the Water Division at (501) 682-0623, if you have any questions.

Sincerely,



Mo Shafii  
Assistant Chief, Water Division

Enclosures

MS:sh

Cc: Electronic Filing (ARG590001)  
Eric Fleming, Branch Manager, Field Services Branch  
Jim Purvis, Administrative Analyst, Fiscal Division  
David Ramsey, ICIS Program Coordinator, Enforcement Branch

*New*

Permit Tracking Number: ARG590001  
AFIN: 51-00164

**NOTICE OF COVERAGE (NOC)  
FOR CONCENTRATED ANIMAL FEEDING OPERATIONS GENERAL PERMIT, ARG590000**

The discharge of an overflow of manure, litter, or process wastewater caused by precipitation into all receiving waters shall be in accordance with all limitations, monitoring requirements, and other conditions set forth in the Concentrated Animal feeding operations General Permit, ARG590000. Coverage under this General Permit is issued to:

C & H Hog Farms  
Hc 72 PO Box 10  
Mount Judea, AR 72655

C & H Hog Farms are located as follows: Hc 72 PO Box 10, Mount Judea, in Newton County, Arkansas. The facility's treatment system consists of in house shallow pits with a capacity of 759,542 gallons, a Settling Basin with a capacity of 831,193 gallons, and a Holding Pond with a capacity of 1,904,730 gallons. All wastes are land applied on 630.7 acres.

Coverage Date: 08/03/2012

Expiration Date: 10/31/2016



Mo Shafii  
Assistant Chief, Water Division  
Arkansas Department of Environmental Quality  
501-682-0616  
shafii@adeq.state.ar.us

In accordance with the provisions of the Arkansas Water and Air Pollution Control Act (Ark. Code Ann. § 8-4-101 *et seq.*), and the Clean Water Act (33 U.S.C. § 1251 *et seq.*),

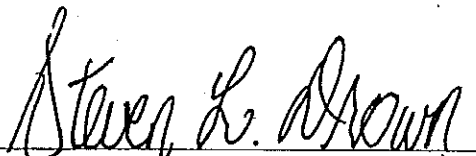
**Eligible Operators of Concentrated Animal Feeding Operations (CAFOs) located within the State of Arkansas**

are authorized to discharge whenever precipitation causes an overflow of manure, litter, or process wastewater into all receiving waters, except those facilities which are excluded in Part 1.4 of this general permit, in accordance with effluent limitations, monitoring requirements, and other conditions set forth in Parts 1 through 10.

After properly filing a Notice of Intent (NOI) and other required documentation under Part 1.5 and proceeding through required public notification processes, facilities that are eligible for coverage under this general permit, will receive a Notice of Coverage (NOC) letter, with a tracking number starting with ARG59, and a copy of the permit for the facility. A copy of the facility's Nutrient Management Plan (NMP) will be included with the coverage letter and incorporated into this general permit as an enforceable permit condition. If site specific permit terms have been required by the Director, these terms will be included with the NOC letter as an enforceable permit condition. Not following terms of the NMP or site specific permit terms is a violation of this permit. The NOC letter includes the Department's determination that a facility is covered under this general permit.

Effective Date: November 1, 2011

Expiration Date: October 31, 2016



Steven L. Drown  
Chief, Water Division  
Arkansas Department of Environmental Quality



Issue Date

## TABLE OF CONTENTS

<b>Part</b>	<b>Title</b>	<b>Page</b>
1	Permit Area and Coverage	1
2	Effluent Limitations and Standards	5
3	Nutrient Management Plans (NMP) and Annual Reporting Requirements	8
4	Special Conditions for Subparts C & D	14
5	NOI and NMP Review & Public Notification Process	18
6	General Conditions	19
7	Operation and Maintenance of Pollution Controls	22
8	Monitoring and Records	24
9	Reporting Requirements	26
10	Definitions	30

**PART 1  
PERMIT AREA AND COVERAGE**

**1.1 Permit Area**

This permit applies to operations defined as Concentrated Animal Feeding Operations (CAFOs) that discharge and are located in the State of Arkansas.

**1.2 Permit Coverage**

This permit covers any operation that meets the definition of a CAFO and discharges pollutants to waters of the state. Once an operation is defined as a CAFO, 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.

**1.3 Eligibility for Coverage**

Unless excluded from coverage in accordance with Part 1.4 below, operators of existing, currently operating animal feeding operations or proposed animal feeding operations that are defined as CAFOs or designated as CAFOs by the Director as defined in Part 10 and that are subject to 40 CFR Part 412, Subparts A (Horses and Sheep), C (Dairy Cows and Cattle Other than Veal Calves) and D (Swine, Poultry and Veal Calves) are eligible for coverage under this permit. As defined in Part 10.9 of this general permit, a CAFO is any one of the following:

1. A large concentrated animal feeding operation,
2. A medium concentrated animal feeding operation, or
3. An animal feeding operation that is designated as a CAFO.

In addition, two or more animal feeding operations under common ownership are considered a single animal feeding operation if they adjoin each other or if they use a common area or system for the disposal of wastes.

**1.4 Limitations on Coverage (Exclusion)**

The following CAFOs are not eligible for coverage under this NPDES general permit, but must apply for an individual permit or other general permit as applicable:

- 1.4.1 CAFOs that have been notified by ADEQ to apply for an individual NPDES permit in accordance with Part 1.6 of this permit.
- 1.4.2 CAFOs housing ducks as defined in 40 CFR 412 under Subpart B – Ducks.
- 1.4.3 CAFOs requesting voluntary performance standards under 40 CFR 412.31(a)(2).
- 1.4.4 CAFOs that have been notified by ADEQ that they are ineligible for coverage because of a past history of repeated non-compliance of permit requirements.
- 1.4.5 Dischargers to water quality impaired water (The latest Arkansas 303(d) list) unless the operator:
  - 1.4.5.1 prevents any discharge that contains pollutant(s) for which the waterbody is impaired, and includes documentation of procedures taken to prevent such discharge in the Nutrient Management Plan (NMP); or

- 1.4.5.2 documents that the pollutant(s) for which the waterbody is impaired is not present at the facility, and retains documentation of this finding with the NMP; or
- 1.4.5.3 in advance of submitting the NOI, provides to ADEQ data to support a showing that the discharge is not expected to cause or contribute to an exceedance of a water quality standard, and retains such data onsite with the NMP. To do this, the operator must provide data and other technical information to ADEQ sufficient to demonstrate:
- a For discharges to waters without an ADEQ approved or established TMDL, that the discharge of the pollutant for which the water is impaired will meet in-stream water quality criteria at the point of discharge to the waterbody; or
  - b For discharges to waters with an ADEQ approved or established TMDL, that there are sufficient remaining wasteload allocations in an ADEQ approved or established TMDL to allow the facility's discharge and that existing dischargers to the waterbody are subject to compliance schedules designed to bring the waterbody into attainment with water quality standards.
- Operators are eligible under this section if they receive an affirmative determination from ADEQ that the discharge will not contribute to the existing impairment, in which case the operator must maintain such determination onsite with the NMP.
- 1.4.6 CAFOs which the Department reasonably believes cannot meet applicable federal effluent limitation guidelines or other conditions of this general permit.

## 1.5 Application for Coverage

### 1.5.1 Operators of CAFOs seeking to be covered by this permit must:

- 1.5.1.1 Submit an NOI. This form is available on the ADEQ website [http://www.adeq.state.ar.us/water/branch\\_permits/general\\_permits/default.htm](http://www.adeq.state.ar.us/water/branch_permits/general_permits/default.htm)
- 1.5.1.2 Submit a nutrient management plan (NMP) with the NOI that meets the requirements of 40 CFR 122 and 412 and have been developed in accordance with Arkansas Natural Resource Conservation Service Practice Standard Code 590 (Nutrient Management), including the Arkansas Phosphorous Index, 2010 Revision.
- 1.5.1.3 Submit an ADEQ Disclosure Statement in accordance with the Arkansas Pollution Control & Ecology Commission's (APCEC) Regulation No. 8.
- 1.5.1.4 Submit permit fees (\$200) upon invoicing, after the initial permit and annually thereafter.
- 1.5.1.5 Submit an ADEQ Form 1 and plans and specifications that stamped by Professional Engineer in Arkansas for construction of pond(s).

### 1.5.2 Where to Submit

CAFOs must submit signed copies of the NOI, NMP and Disclosure Statement (and ADEQ Form 1, if applicable) by mail to:

Arkansas Department of Environmental Quality  
General Permits Branch – Water Division  
5301 Northshore Drive  
North Little Rock, AR 72118

Or by electronic mail (Complete documents must be submitted in PDF format) to:

[Water-permit-application@adeq.state.ar.us](mailto:Water-permit-application@adeq.state.ar.us)

## 1.6 Requiring an Individual Permit

- 1.6.1 ADEQ may at any time require any facility authorized by this permit to apply for, and obtain, an individual NPDES permit. ADEQ will notify the operator, in writing, that an application for an individual permit is required and will set a time for submission of the application. Coverage of the facility under this general NPDES permit is automatically terminated when: (1) the operator fails to submit the required individual NPDES permit application within the defined time frame; or (2) the individual NPDES permit is issued by ADEQ.
- 1.6.2 Any operator covered under this general permit may request to be excluded from the coverage of this permit by applying for an individual permit. The operator shall submit an application for an individual permit (ADEQ Form 1, Disclosure Form, and Form 2B) with the reasons supporting the application to ADEQ. If a final, individual NPDES permit is issued to an operator otherwise subject to this general permit, the applicability of this NPDES CAFO general permit to the facility is automatically terminated on the effective date of the individual NPDES permit. Otherwise, the applicability of this general permit to the facility remains in full force and effect (for example, if an individual NPDES permit is denied to an operator otherwise subject to this general permit).

## 1.7 Continuation of this Permit

If this permit is not reissued or replaced prior to the expiration date, it will be administratively continued in accordance with 40 CFR 122.6 and remain in force and effect. If you were authorized to discharge under this permit prior to the expiration date, any discharges authorized under this permit will automatically remain covered by this permit until the earliest of:

- 1.7.1 Your authorization for coverage under a reissued permit or a replacement of this permit following your timely and appropriate submittal of a complete NOI requesting authorization to discharge under the new permit and compliance with the requirements of the new permit; or
- 1.7.2 A formal decision by ADEQ to grant the permittee's request for termination of permit coverage; or
- 1.7.3 Issuance or denial of an individual permit for the facility's discharges; or
- 1.7.4 A formal permit decision by ADEQ not to reissue this general permit, at which time ADEQ will identify a reasonable time period for covered dischargers to seek coverage under an alternative general permit or an individual permit. Coverage under this permit will cease at the end of this time period.
- 1.7.5 The permit will be voided upon failure to pay annual permit fee.

## 1.8 Change in Ownership

If a change in the ownership of a facility whose discharge is authorized under this permit occurs, a written agreement containing a specific date for transfer of permit responsibility, coverage, and liability between the current and new permittees must be submitted to ADEQ at the address specified in Part 1.5.6. The new owner must submit an ADEQ Disclosure Statement with the transfer request on an ADEQ Transfer Form. ADEQ will notify the new permittee if the transfer of permit coverage is granted.

Until the disclosure statement and transfer request are submitted and accepted by ADEQ, the current permittee shall remain liable for all permit fees and meeting permit requirements, even if the current permittee no longer owns the facility.



1.9 **Closure Plan Required**

Should a permitted concentrated animal feeding operation cease operation, the permittee shall submit to the Department a closure plan for the liquid waste system storage/treatment structure(s) within sixty (60) days of the final day of operation for Department review and approval. Within ten (10) days of completion of closure activities, the permittee must submit certification that the facility was closed in accordance with the approved plan. The closure plan and closure certification shall be prepared by the USDA Natural Resource Conservation Service addressing the closure of facilities in accordance with Arkansas NRCS Conservation Practice Standard Code 360 (Closure of Waste Impoundments)), 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.

**PART 2**  
**EFFLUENT LIMITATIONS AND STANDARDS**

**2.1 Effluent Limitations and Standards for Subpart A – Horses and Sheep**

**2.1.1 Effluent Limitations**

2.1.1.1. Except when the provisions of Part 2.1.1.2 apply, there shall be no discharge of process wastewater pollutants into Waters of the State.

2.1.1.2. Whenever rainfall events cause an overflow of process wastewater from a facility designed, constructed, operated, and maintained to contain all process-generated wastewaters plus the runoff from a 25-year, 24-hour rainfall event at the location of the point source, any process wastewater pollutants in the overflow may be discharged into Waters of the State. Samples must be collected as specified in Part 2.3 of this general permit.

**2.2 Effluent Limitations and Standards for Subpart C (Dairy Cows and Cattle Other Than Veal Calves) and Subpart D (Swine, Poultry And Veal Calves)**

**2.2.1 Production areas:**

2.2.1.1. There must be no discharge of manure, litter, or process wastewater pollutants into Waters of the State from the production area except;

2.2.1.2. All CAFOs subject to 40 CFR 412 Subpart C and existing sources subject to 40 CFR 412 Subpart D: whenever precipitation causes an overflow of manure, litter, or process wastewater, pollutants in the overflow may be discharged into Waters of the State provided:

- a The production area is designed, constructed, operated and maintained to contain all manure, litter, and process wastewater including the runoff and the direct precipitation from a 25-year, 24hour rainfall event;
- b Samples are collected as specified in Part 2.3 of this general permit;
- c The production area is operated in accordance with the additional measures and records as specified in Part 4.4 of this permit.

**2.2.2 Land application areas:** Discharges from land application areas are subject to the following requirements:

2.2.2.1. Develop and implement the Best Management Practices (BMP) specified in Parts 4.1 and 4.2 of this permit;

2.2.2.2. Maintain-all records needed to document compliance with Part 4.5 of this permit ;

2.2.2.3. There shall be no discharge of manure, litter, or process wastewater to a water of the State from a CAFO as a result of the application of manure, litter or process wastewater to land areas under the control of the CAFO, except where it is an agricultural storm water discharge.”

2.3 **Sampling and Monitoring Requirements for All Discharges from Retention Structures**

In the event of any overflow or other discharge of pollutants from a manure or wastewater storage or retention structure, whether or not authorized by this permit, the following actions shall be taken.

2.3.1 All discharges to waters of the state shall be sampled and analyzed for the following parameters

Parameters	Limits	Sample Frequency	Sample Type
Flow Volume (GPD)	Report	Once per discharge event	Estimate
Flow Date	Report	N/A	N/A
Flow Time	Report	N/A	N/A
Biochemical oxygen demand (BOD5)	Report	Once per discharge event	Grab
Total suspended solids (TSS)	Report	Once per discharge event	Grab
Fecal Coliform bacteria (FCB)	Report	Once per discharge event	Grab
Total phosphorus (TP)	Report	Once per discharge event	Grab
Ammonia nitrogen (NH3-N)	Report	Once per discharge event	Grab
Total nitrogen (TN)	Report	Once per discharge event	Grab
Nitrate nitrogen (NO3)	Report	Once per discharge event	Grab
pH	Report	Once per discharge event	Grab

2.3.2 The sample shall be collected and analyzed in accordance with EPA approved methods for water analysis listed in 40 CFR 136. Samples collected shall be representative of the monitored discharge.

2.3.3 If conditions are not safe for sampling, the permittee must provide documentation of why samples could not be collected and analyzed. For example, the permittee may be unable to collect samples during dangerous weather conditions (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.). However, once dangerous conditions have passed, the permittee shall collect a sample from the retention structure (pond or lagoon) from which the discharge occurred.

2.3.4 Monitoring results must be submitted to ADEQ Water Enforcement Division, within thirty (30) days of the discharge event at the address listed in Part 8.4 of this permit.

2.4 **New source performance standards (NSPS) for Subpart D (Swine, Poultry and Veal Calves)**

Any new source subject to this subpart must achieve the following effluent limitations representing the application of NSPS. Land application requirements for new source CAFOs subject to Subpart D are identical to those of Part 2.2.2.

2.4.1 Any CAFO subject to this subpart may request that the Director establish NPDES permit best management practice effluent limitations designed to ensure no discharge of manure, litter, or process wastewater based upon a site-specific evaluation of the CAFO's open surface manure storage structure. The NPDES permit best management practice (BMP) effluent limitations must address the CAFO's entire production area. In the case of any CAFO using an open surface manure storage structure for which the Director establishes such effluent limitations, "no discharge of

manure, litter, or process wastewater pollutants," as used in this section, means that the storage structure is designed, operated, and maintained in accordance with best management practices established by the Director on a site-specific basis after a technical evaluation of the storage structure. The technical evaluation must address the following elements:

- 2.4.1.1. Information to be used in the design of the open manure storage structure including, but not limited to, the following: minimum storage periods for rainy seasons, additional minimum capacity for chronic rainfalls, applicable technical standards that prohibit or otherwise limit land application to frozen, saturated, or snow-covered ground, planned emptying and dewatering schedules consistent with the CAFO's Nutrient Management Plan, additional storage capacity for manure intended to be transferred to another recipient at a later time, and any other factors that would affect the sizing of the open manure storage structure.
- 2.4.1.2. The design of the open manure storage structure as determined by the most recent version of the National Resource Conservation Service's Animal Waste Management (AWM) software. CAFOs may use equivalent design software or procedures as approved by the Director.
- 2.4.1.3. All inputs used in the open manure storage structure design including actual climate data for the previous 30 years consisting of historical average monthly precipitation and evaporation values, the number and types of animals, anticipated animal sizes or weights, any added water and bedding, any other process wastewater, and the size and condition of outside areas exposed to rainfall and contributing runoff to the open manure storage structure.
- 2.4.1.4. The planned minimum period of storage in months including, but not limited to, the factors for designing an open manure storage structure listed in part 2.4.1.1. of this section. Alternatively the CAFO may determine the minimum period of storage by specifying times the storage pond will be emptied consistent with the CAFO's Nutrient Management Plan.
- 2.4.1.5. Site-specific predicted design specifications including dimensions of the storage facility, daily manure and wastewater additions, the size and characteristics of the land application areas, and the total calculated storage period in months.
- 2.4.1.6. An evaluation of the adequacy of the designed manure storage structure using the most recent version of the Soil Plant Air Water (SPAW) Hydrology Tool. The evaluation must include all inputs to SPAW including but not limited to daily precipitation, temperature, and evaporation data for the previous 100 years, user-specified soil profiles representative of the CAFO's land application areas, planned crop rotations consistent with the CAFO's Nutrient Management Plan, and the final modeled result of no overflows from the designed open manure storage structure. For those CAFOs where 100 years of local weather data for the CAFO's location is not available, CAFOs may use a simulation with a confidence interval analysis conducted over a period of 100 years. The Director may approve equivalent evaluation and simulation procedures.
- 2.4.1.7. Waste management and storage facilities designed, constructed, operated, and maintained consistent with the analysis conducted in Parts 2.4.1.1 through 2.4.1.6 of this section and operated in accordance with the additional measures and records required by Part 4.4 of this permit, will fulfill the requirements of this section.
- 2.4.1.8. The Director has the discretion to request additional information to support a request for effluent limitations based on a site-specific open surface manure storage structure.

**PART 3**  
**NUTRIENT MANAGEMENT PLANS (NMP) AND ANNUAL REPORTING REQUIREMENTS**

**3.1 APPLICABILITY**

Any CAFO with permit coverage under this general permit shall develop and implement a site-specific nutrient management plan (NMP). The NMP must be in compliance with 40 CFR 122 and 412 and developed in accordance with the Arkansas NRCS Conservation Service Practice Standard Code 590 (Nutrient Management), including the Arkansas Phosphorus Index, 2010 Revision.”

**3.2 NUTRIENT MANAGEMENT PLAN CONTENTS**

**3.2.1 Requirement to implement a nutrient management plan.**

All CAFOs covered under this general permit must implement the site-specific nutrient management plan that, at a minimum, contains practices and procedures necessary to implement the applicable effluent limitations and standards. In addition, the NMP must, as applicable:

- 3.2.1.1 Ensure adequate storage of manure, litter, and process wastewater, including procedures to ensure proper operation and maintenance of the storage facilities;
- 3.2.1.2 Ensure proper management of mortalities (i.e., dead animals) to ensure that they are not disposed of in a liquid manure, stormwater, or process wastewater storage or treatment system that is not specifically designed to treat animal mortalities;
- 3.2.1.3 Ensure that clean water is diverted, as appropriate, from the production area;
- 3.2.1.4 Prevent direct contact of confined animals with waters of the State;
- 3.2.1.5 Ensure that chemicals and other contaminants handled on-site are not disposed of in any manure, litter, process wastewater, or stormwater storage or treatment system unless specifically designed to treat such chemicals and other contaminants;
- 3.2.1.6 Identify appropriate site specific conservation practices to be implemented, including as appropriate setback, buffers or equivalent practices, to control runoff of pollutants to waters of the State;
- 3.2.1.7 Identify protocols for appropriate testing of manure, litter, process wastewater, and soil;
- 3.2.1.8 Establish protocols to land apply manure, litter or process wastewater in accordance with site specific nutrient management practices that ensure appropriate agricultural utilization of the nutrients in the manure, litter or process wastewater; and
- 3.2.1.9 Identify specific records that will be maintained to document the implementation and management of the minimum elements described in parts 3.2.1.1 to 3.2.1.8 of this section.

**3.2.2. Recordkeeping requirements**

- 3.2.2.1 The permittee must create, maintain for five years, and make available to the Director, upon request, the following records:
  - a All applicable records identified pursuant part 3.2.1.9 above
  - b All CAFOs must comply with record keeping requirements as specified in Parts 4.4.2. , 4.5., and 8.6 of this permit.