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## TEXAS STATE SOIL & WATER CONSERVATION BOARD

Nacogdoches Poultry Office

*Protecting and Enhancing Natural Resources for Tomorrow*

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July 15, 2015

The following pages are components of a typical Water Quality Management Plan for a poultry operation. This is only an example plan to give readers a good perspective of what is contained in typical poultry WQMPs. This is a fictitious operation and does not actually exist. While the location is not real, the practices and guidance included here are real and are typical of those that would be found in an actual WQMP for a poultry operation. Please bear in mind that all WQMPs are site specific, so each poultry operation will have a unique WQMP developed for actual conditions at that site and therefore may differ from the one presented here.

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## Conservation Plan

EXAMPLE POULTRY FARM  
 FM 123  
 EXAMPLE, TX 759xx

### Animal Mortality Facility (316)

Routine poultry mortality will be disposed of in an approved composter. See practice 317-Compost Facility for details.

Routine poultry mortality may also be disposed of in a dual-chambered incinerator that will be operated according to TCEQ requirements. The incinerator will be operated only during daylight hours and no more than 100 lbs/hr of carcasses will be incinerated. The incinerator may not be used to incinerate items other than animal carcasses. The incinerator must be registered with TCEQ via the PI-7 form and meet their permit-by-rule (PBR) 30 TAC 106.494 requirements. Producer should receive a letter from TCEQ acknowledging the registration. That letter should be kept in producer's copy of the WQMP. Dumping or burial of daily routine mortality is not allowed. In case of catastrophic die-off that exceeds 0.3% per day of total flock, burial may be allowed. Refer to information sheets and Catastrophic Burial Map elsewhere in plan for site specific information. Other options for disposal of catastrophic mortality include on-site composting, transport to a TCEQ approved landfill, or storage on-site for up to 72 hours in a varmint-proof receptacle to prevent odor, leakage, or spillage while the normal method is used to dispose of all remaining mortality. Plan now for how to dispose of catastrophic mortality before it occurs.

Field	Planned Amount	Month	Year	Applied Amount	Date
7	2 no	6	2015		
Total:	2 no				

### Compost Facility (317)

Install and maintain a compost facility near poultry houses for disposal of poultry mortality. If facility is cost-shared, it must be designed and constructed according to NRCS specifications. Management of composter will be according to the following recipe: For each 1 pound of carcasses, include 1.5 pounds of litter, 0.1 pounds of straw, wood chips, wood shavings, or rice hulls, and 0.3 pounds of water. Alternate layers of materials starting with 6-12" of litter on bottom, followed by a layer of carcasses, covered by a 6" layer of litter, alternately until bin is full. Use appropriate probe-type thermometer to monitor temperature of piles. Temperature should reach 130-150°F for at least 5 days to reduce pathogens and odors. If temperature exceeds 160°F, all the material should be removed from the composter to prevent spontaneous combustion. When temperature of material in primary bin falls below 120°F (in 7 to 10 days), move mixture to secondary bin to aerate and allow composting action to continue. The temperature of the mixture should rise again to initiate additional 7-10 days of composting action. This process should provide finished compost in about 14-21 days. The mixture may be applied to fields as fertilizer or stockpiled to allow further decomposition. Do not allow animals to graze pastures for at least 60 days after composted carcasses have been applied.

Field	Planned Amount	Month	Year	Applied Amount	Date
7	1 no	6	2015		
Total:	1 no				

**Critical Area Planting (342)**

COOL SEASON - This practice is implemented to establish permanent vegetation on sites that have, or are expected to have, high erosion rates and/or have physical, chemical, or biological conditions that prevent establishment of vegetation with normal practices. Shape bare areas around poultry houses so establishment of vegetation and maintenance can be performed by farm equipment. Prepare a firm, smooth, weed-free seedbed. Plant ryegrass (12 lbs PLS/ac) or similar cool season species at recommended rate in the Fall season as soon as construction is complete between September and December. Retreat as needed the following Fall season. This will serve as temporary vegetative cover until permanent cover can be established. Fertilize and lime according to a current soil analysis and control weeds by mowing or by use of approved herbicides for establishment. Ensure pH is above 5.7. Poultry litter may be used for establishment of vegetation in these areas in accordance with a current soil and litter analysis.

Field	Planned Amount	Month	Year	Applied Amount	Date
7	18 ac	10	2015		
Total:	18 ac				

**Critical Area Planting (342)**

SPRING SEASON - This practice is implemented to establish permanent vegetation on sites that have, or are expected to have, high erosion rates and/or have physical, chemical, or biological conditions that prevent establishment of vegetation with normal practices. Shape bare areas around poultry houses so establishment of permanent vegetation and maintenance can be performed by farm equipment. Prepare a firm, smooth, weed free seedbed. Plant bermudagrass at 6 lbs PLS/ac and/or bahia at 15 lbs PLS/ac between March 1 and June 1. Fertilize and lime for establishment according to a current soil analysis and control weeds by mowing or by use of approved herbicides. Ensure pH is between 5.5 and 7.0. Poultry litter may be used for establishment of vegetation in these areas in accordance with a current soil and litter analysis.

Field	Planned Amount	Month	Year	Applied Amount	Date
7	18 ac	3	2016		
Total:	18 ac				

**Filter Strip (393)**

Maintain a minimum 100 foot wide buffer between application area(s) and all adjacent residential property lines, creeks, ponds, and waterways. Maintain a 150 foot buffer between application area(s) and all private wells and 500 feet for public wells. Animal waste will not be applied to these buffer areas.

Field	Planned Amount	Month	Year	Applied Amount	Date
1	16 ac	6	2015		
5	0.5 ac	6	2015		
6	3 ac	6	2015		
Total:	19.5 ac				

**Forage Harvest Management (511)**

COASTAL BERMUDAGRASS - Cutting and removal of forages will be managed to produce the desired quality and quantity, to promote vigorous regrowth, and to maintain stand life. Cut forage plants at a stage of maturity or harvest interval range that will provide adequate food reserves and/or basal or auxiliary tillers or buds for regrowth and/or reproduction to occur without loss of plant vigor. If plants show signs of short-term environmental stress, harvests will be adjusted in a manner that encourages the continued health and vigor of the stand. Employ a harvest regime that utilizes the maximum amount of available or targeted nutrients. Using this practice for this purpose may require more frequent harvests to increase uptake instead of managing for stand longevity. Leave stubble height of between 3 to 4 inches.

Field	Planned Amount	Month	Year	Applied Amount	Date
3	17 ac	6	2015		
5	29 ac	6	2015		
6	39 ac	6	2015		
Total:	85 ac				

**Heavy Use Area Protection (561)**

This practice is applied every year to protect areas from soil erosion by maintaining vegetative cover around poultry houses, barns, roads, etc. These areas will be mowed and pests controlled as needed and will be fertilized at maintenance for optimum growth.

Field	Planned Amount	Month	Year	Applied Amount	Date
2	1 ac	6	2015		
7	18 ac	6	2015		
Total:	19 ac				

**Herbaceous Weed Control (315)**

CHEMICAL CONTROL: Read and follow all product label directions. Calibrate application equipment prior to application to ensure proper application rates for specific chemicals. Dispose of unused material according to label directions. MECHANICAL CONTROL: Shred or mow weeds about one inch above the average height of the grass or crop. In areas of heavy competition, remove piled material after mowing to prevent shading or smothering of desired vegetation. Weeds should be controlled prior to bloom stage.

Field	Planned Amount	Month	Year	Applied Amount	Date
1	129 ac	6	2015		
2	1 ac	6	2015		
3	17 ac	6	2015		
5	29 ac	6	2015		
6	39 ac	6	2015		
7	18 ac	6	2015		
Total:	233 ac				

**Prescribed Grazing (528)**

This practice is applied every year. Coastal Bermudagrass pastures will be grazed no closer than 3 inches to maintain forage health and vigor for reduced soil erosion, water quality benefits, and improved animal performance.

Field	Planned Amount	Month	Year	Applied Amount	Date
1	129 ac	6	2015		
Total:	129 ac				

**Nutrient Management (590)**

Nutrient management of poultry manure and commercial fertilizer will be used to achieve forage production goals and prevent water pollution to surface and groundwater. Nutrient management of poultry litter, commercial fertilizers, and lime will be according to a current soil analysis (not more than 12 months old). Nutrient management and application rate of poultry litter will be according to the "Waste Utilization and Nutrient Management" section of this conservation plan. Nutrient management will be based on a nutrient budget, crop production goals, soil fertility analysis, manure analysis, and extractable phosphorus analysis for fields in which poultry litter may be applied. A soil sample must be collected and analyzed every year from each field where poultry litter is applied to monitor nutrient build-up. A litter sample must be collected and analyzed each year whether or not the litter is used. Litter will not be applied within 100 feet of creeks, streams, rivers, ponds, lakes, springs, other waterways or surface water bodies, depressions, playas, excavation pits or a neighboring residence. A minimum application distance of 500 feet from public wells and 150 feet from private wells, mine shafts, faults, extensive vertical soil cracks, solution cavities, sinkholes, caves, extensive animal burrowings, other surface penetrations, or any other natural or artificial feature that will constitute a recharge conduit for an aquifer. Litter will not be applied to saturated or frozen soils. Litter will not be applied on frequently flooded soils as designated by NRCS soil survey maps. Litter will not be applied on slopes greater than 8% unless being applied as a component of an erosion control plan. Litter stored or stockpiled should be kept under a roofed structure or covered with impermeable material to protect from rainfall or bermed to prevent polluted rainfall runoff. Tops and sides of piles should be adequately sloped to ensure proper drainage. Runoff from storage piles must be retained on site and will not be located in areas where runoff will reach water bodies and recharge features described above.

Field	Planned Amount	Month	Year	Applied Amount	Date
1	87 ac	6	2015		
3	17 ac	6	2015		
5	28 ac	6	2015		
6	36 ac	6	2015		
Total:	168 ac				

**Upland Wildlife Habitat Management (645)**

Create, maintain or enhance area(s) to provide upland wildlife food and cover.

Field	Planned Amount	Month	Year	Applied Amount	Date
4	36 ac	6	2015		
Total:	36 ac				

**Water Well (642)**

Install water well. All wells will be installed by licensed water well driller and properly cased and protected from possible exposure to chemicals, petroleum, and waste products. Wells should be drilled and located in accordance with 16 TAC §76.1000, at least 50 feet away from sources of potential contamination such as poultry houses, litter barns, & composters.

Field	Planned Amount	Month	Year	Applied Amount	Date
2	1 no	6	2015		
7	4 no	6	2015		
Total:	5 no				

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# Waste Utilization and Nutrient Management Plan

## EXECUTIVE SUMMARY:

Example Poultry Farm

Soil samples must be collected annually from fields where animal manure will be applied in the upcoming year and samples sent to a qualified lab for analysis. Refer to Table 6 for application rate for each field.

Litter samples will be collected and analyzed annually, regardless whether litter is removed from farm or not.

## LOCATION OF OPERATION AND PURPOSE OF THE PLAN

This poultry operation is located in **Example** County (see plan map for location). The purpose of this plan is to outline the details of the land application of the poultry litter produced in this operation. When the plan is fully implemented, it should minimize the effects of the land application of poultry litter on the soil, water, air, plant, and animal resources in and around the application area. This plan, when applied, will meet the requirements of the Natural Resources Conservation Service (formerly the Soil Conservation Service) Waste Utilization Standard and Nutrient Management Standard.

The birds will be housed in **8** houses (average size: **46' x 600'**) with approximately **28,300** birds placed in each house (less **3.0** % mortality). About **5.0** flock(s) are raised each year, the final weight of birds will be about **8.00** pounds. Each flock will be present for about **9** weeks. The average number of days each year that the facilities will contain birds is **315** days.

# Waste Utilization and Nutrient Management Plan

TABLES 1, 2 and 2a

Example Poultry Farm

Values in Table 1 may be based on actual analysis or "book" values during the initial planning to determine land application rates for the initial plan. When "book" values are used, they will be from NRCS, Texas Cooperative Extension or averages from other TX testing lab sources. Site specific data will be used as soon as feasible after production begins. The poultry litter will be tested annually or in the year of application if stored for more than one year. If the actual values are more than 10% higher or lower than the "book" values, this plan will need revision.

The application of poultry litter may be made up to the Maximum Rate given in Table 2 or 2a as applicable. Table 2 applies to those that are subject to Nutrient Management Plan (NMP) requirements while Table 2a applies when subject to Nutrient Utilization Plan (NUP) requirements. The current requirements for both the NMP and NUP are given in the headers of the tables. Table 2a has a criteria involving the distance to a named stream when the Soil Test P Level is above 350 ppm in arid areas as well as special requirements when the site is in a TMDL watershed designated by TCEQ. For various P Index Ratings, the maximum rates in Table 2 are based on crop requirements, whereas the maximum rates in Table 2a are based on crop removal rates. County rainfall information can be found in the TX Agronomy Technical Note 15, Phosphorus Assessment Tool for Texas, located in the eFOTG at the address given in the section entitled "Collecting Soil Samples for Analyses".

## CROP REMOVAL RATES:

Crop Removal Rates of nitrogen (N), phosphorus (P), and potassium (K) in pounds per acre are given in Table 3 for the crop and yield planned for each field. This Table is included for information only, and should be used during the planning process to compare planned or maximum application rates to crop removal. Crop removal rates may be based on actual analysis of harvested material or default values in the database. P build-up will occur at higher rates when crop removal rates are exceeded.

## LITTER APPLICATION:

The maximum litter application rates are given in Table 4 along with the current soil test P level, maximum  $P_2O_5$  application rate, maximum tons per acre of litter and the total tons of litter per field that can be applied. The maximum tons of litter that can be utilized on the fields planned is indicated in the box near the lower left corner of Table 4. When the total application acres of the fields are adequate to allow all of the litter to be applied, "Adequate" will be indicated below the tonnage in this box. If "Not Adequate" is indicated, then the lower box will indicate the tons of litter that must be utilized off-site unless more fields/acres are added. This plan is valid only if the application of litter to the crops listed does not exceed the per acre rates by more than 10%. If the yield of a crop does not meet the expected goal, the application rate should be adjusted accordingly the following year. All excess litter will be sold or given away for off-site application.

The estimated amounts of N,  $P_2O_5$ , and  $K_2O$  contained in the litter applied are given in Table 5 for the maximum application rate. Supplemental N and  $K_2O$  will be applied to achieve the yield goals in Table 4 when recommended by the soil test and the maximum rate of the litter does not meet the crop needs. When the maximum application rate is applied and Table 5 indicates additional commercial nutrients, they **must** be applied to fields as indicated. **NOTE:** If additional nitrogen is recommended, the producer should consider collecting soil samples from the 6 - 36 inch layer to see if there is any additional deep nitrogen available. Additional deep nitrogen within the root zone of the crop can be substituted for supplemental commercial nitrogen, and should be included in the soil test N ppm entry.



# Waste Utilization and Nutrient Management Plan

LITTER APPLICATION: (cont)

Example Poultry Farm

In situations where more land is available than is needed to utilize the maximum application rate on each field, the application rates in Table 6 have been reduced down to the level that does not exceed the amount of litter produced. Table 7 indicates the amount of nutrients provided and, if needed, the supplemental nutrients which **must** be applied when application is based on these rates. The amounts of supplemental nutrients in Table 7 are based on the actual amount of litter available rather than the **maximum** rate that "**could**" be applied.

The second line from the bottom of Table 6 on the right has a box that will be "**YES**" or "**NO**". When the reduced rates use all litter produced in a year, this box will be "**Yes**". If the percentages are too low, it will be "**No**". If "**No**", either more acreage is needed on which to apply the litter or the litter will need to be transported off-site. The amount is located on the bottom line on the extreme right of the page.

Actual application will be based on the actual quantities produced, as well as, the current litter analyses. **Application at the MAXIMUM rates shown in Table 4 will result in a more rapid build-up of phosphorus than if applied at lower rates. A different percentage may be used as long as the rate does not exceed the maximum shown in Table 4 for the field and the proper amount of supplemental nutrients are applied. Applying a lower rate to the fields with higher soil test P levels will slow down the P buildup and extend their land application life. Phosphorus will also build up more rapidly on pastureland than on hayland or cropland, since very few nutrients are actually removed by grazing animals.**

The litter may be applied to the same acreage every year according to the P Index rating as long as the soil test P level does not exceed the 200/350 ppm level. The crop requirement rates in both Table 4 and 6 may be doubled not to exceed the nitrogen requirement or nitrogen removal rate, as applicable, when this biennial rate has been used, no additional phosphorus fertilizer or animal wastes may be applied in the alternate year. A column in both tables indicates whether the rates given are Annual Rates (A) or Biennial Rates (B). Rates given are based on Table 2 or 2a as applicable. Annual application rate for fields in a TMDL area with a Soil Test P level equal to or greater than 500 ppm or any field in a TMDL area with P Index Rating of Very High is 0.5 annual crop removal rate.

Land application of poultry litter should be made at appropriate times to meet crop needs, but can be made at any time as long as the total annual (or biennial) rate is not exceeded. The poultry litter should be surface applied uniformly. Solids will not be applied to slopes >8% with a runoff curve >80, or steeper than 16% slope with a runoff curve of 70 or greater, unless the application is part of an erosion control plan. Waste will not be spread at night, during rainfall events, or on frozen or saturated soils if a potential risk for runoff exists. Waste will not be applied to frequently flooded soils during months when the soils typically flood. If frequently flooded soil occur on any potential application field see attached, "Water Features Table", for months when flooding is expected. If a spreader with a capacity to haul about 5.5 cubic yards of litter (about 2.4 tons of litter) is used, it should take about 11 trips to remove 1 inch of litter from 1 house. Surface applications with trucks should only be made when soil conditions are favorable in order to minimize soil compaction.

## EFFLUENT APPLICATION:

There is no effluent application in this plan. If any is produced, it will be transported off-site.

### Managing Leaching -

When soils with sandy, loamy sand, or gravelly surface textures have a Nitrogen Leaching Index score of >2 appropriate measures will be used to minimize the potential of leaching. These measures will include, split applications of waste, and may include double cropping, or cover crops, and irrigation water management (on fields that receive supplemental or full irrigation).

# Waste Utilization and Nutrient Management Plan

## Managing Runoff -

Example Poultry Farm

A minimum 100 ft. setback or vegetated buffer (Filter Strip, Field Border, Riparian Forested Buffer, etc.) will be established and maintained between the application area and all surface water bodies, sink holes, and watercourses as designated on Soil Survey sheets or USGS topographic maps. A minimum application distance from private and public will be 150 ft. and 500 ft. respectively. A minimum application distance from water wells used exclusively for agricultural irrigation will be 100 ft. The minimum distance from a school, institution, densely populated residential, business or similar development should be at least 1000 feet. **These areas will be marked as non-application areas on the application area map.** Table 8 provides the field numbers and acreages for each area.

## MORTALITY MANAGEMENT:

Dead birds will be collected daily and deposited into an approved composting facility. Contact the local Soil and Water Conservation District or USDA/NRCS office for design specifications for approved composters. Land application of composted material will be in accordance with soil tests and composted material analysis same as previously described for litter application. Texas A&M recommends that the compost only be applied to hayland or pasture that will not be grazed for at least 30 days after application.

## MORTALITY BURIAL:

Poultry mortality may be buried on-site only during a major die-off (0.3% of total flock). Burial is not allowed as a routine method of dead bird disposal. The normal method of disposal discussed above must still be used up to its capacity. You are not required to bury the excessive die-off. They may be transported to a landfill, stored in a leak proof container for up to 72 hours while you dispose of the carcasses through the normal disposal method, transported to the rendering plant, or arrange for freezer units to contain the carcasses. The use of a rendering plant or a landfill are excellent options if mortality can be loaded and transported while still fresh or the mortality can be refrigerated until loaded and transported.

The preferred method for disposal is by a rendering plant. Before planning this method, contact the facility or its representative of special handling procedures, equipment needs, scheduling requirements, etc. Maintain a list of contact phone numbers so information will be readily available following a catastrophic die-off. Verify that local companies which have previously picked up and/or rendered dead animals are still doing so. A number of rendering companies have stopped dead animal pick up service, and others have raised their fees significantly. Periodically review the availability and cost of rendering so that the plan can be modified if necessary.

Disposal in a landfill may be an option in some locations. Before planning this option, the closest commercial, regional, county, or municipal landfill should be contacted to determine if the landfill has a permit which would allow acceptance of dead animals. Also ask if there are any restrictions on type and volume of animal mortality that will be accepted at the facility. Landfill fees and transport, offloading, and handling procedures should be discussed with landfill managers and documented for reference when needed.

The landfill is not a viable option if the producer does not own or have access to a vehicle capable of transporting mortality quickly in an emergency situation. After a catastrophic die-off is not a good time to find out that a driver and truck to transport mortality will not be available for several weeks (**MAKE ARRANGEMENTS NOW, NOT AFTER THE ANIMALS ARE DEAD**).

# Waste Utilization and Nutrient Management Plan

**MORTALITY MANAGEMENT: (cont)**

Example Poultry Farm

On-farm disposal of catastrophic mortality may be considered if site conditions permit. On-farm methods include burial, composting, and incineration. Incinerators and composters usually do not have the capacity to handle mortality volumes associated with catastrophic events. Composting and incineration should not be relied on for catastrophic mortality handling without a documented evaluation of worst anticipated mortality condition (number, type, and weight of animals), and the anticipated capacity of the system (i.e., lb./hr. incineration rate, hrs/day of operation). NRCS Mortality Facility Standard 316 will be used for all mortality management.

If you do decide to bury on-site, carcasses should be buried in non-permeable soils and covered immediately with **at least 2 feet of soil**. No carcass burial is allowed within **150 feet of all water courses, ponds, lakes, frequently flooded areas, wetlands, or adjacent property lines**. No carcass burial is also allowed within **150 feet of private wells or 500 feet of public wells**. Refer to NRCS for guidance on appropriate soil types for burial. These are only guidelines to help you dispose of dead birds properly. However, you are still responsible for any problems that may result from burial of carcasses, even if you follow this guidance.

See the attached soil interpretation, ENG - Animal Mortality Disposal (Catastrophic) Trench, to make a preliminary assessment of the limitations of the soils on this farm for burial of catastrophic mortality. The attached TX NRCS Technical Guidance, Catastrophic Animal Mortality Management (Burial Method) should be used as a guide to overcome minor limitations and as design criteria for the construction of burial pits for catastrophic mortality. Mortality burial sites shall be located outside the 100 -year floodplain. Mortality burial will not be less than 150 feet from a well, spring, or water course. **A FIELD INVESTIGATION BY A QUALIFIED PROFESSIONAL SHOULD BE MADE BEFORE AN AREA IS USED FOR A BURIAL SITE FOR CATASTROPHIC MORTALITY EVENTS.**

## **ODOR MANAGEMENT:**

The following steps should be taken when spreading effluent or solids to reduce problems associated with odor.

1. Avoid spreading poultry litter when wind will blow odors toward populated areas.
2. Avoid spreading poultry litter immediately before weekends or holidays, if people are likely to be engaged in nearby outdoor activities.
3. Avoid spreading poultry litter near heavily traveled highways.
4. Make applications in the morning when the air is warming, rather than in the late afternoon.
5. All materials will be handled in a manner to minimize the generation of particulate matter, odors, and greenhouse gas emissions.

## **FEEDING POULTRY LITTER TO CATTLE:**

If poultry litter is fed to cattle, be aware that nutrients may build-up more rapidly where cattle are grazed. Although the litter is consumed by the cattle, the majority of the phosphorus contained in the litter will pass through the animal in the form of manure and into the soil, causing a gradual excess build-up of soil phosphorus. For more information, refer to Texas Agricultural Experiment Station publication "*Feeding Broiler Litter to Beef Cattle*".

# Waste Utilization and Nutrient Management Plan

## LITTER STORAGE:

Example Poultry Farm

If necessary, dry poultry litter may be temporarily stored in a manner to maintain the dryness of the litter and to prevent contamination of groundwater and runoff water. Litter will be contained under a roofed structure meeting USDA NRCS standards located on soil, geology, and topography suitable to prevent contamination of waters. Litter may also be temporarily stockpiled and covered with durable plastic or other suitable tarp material. Runoff from all stored litter must be retained on-site by use of berms or other adequate structures to prevent transport of litter into waterways.

## LITTER ANALYSIS:

A litter analysis is needed to get a better idea of the nutrients actually being applied. Litter samples will be collected annually, or in the year of its use if it is typically stored for more than 1 year. The sample should be collected from the houses at the time of application and submitted immediately to a lab for testing. If sent to Texas A&M soil lab or SFASU Soil Testing Lab for analysis, use the "plant and forage analysis" form and note the type of operation. e. g. broiler, breeder, etc. Request that the litter be analyzed for percent dry matter, total nitrogen, total phosphorus, and total potassium. Further information on collecting effluent and manure samples for analysis can be found in the TCE publication No. L-5175, *"Managing Crop Nutrients Through Soil, Manure and Effluent Testing"*. **TCEQ sampling rules and testing requirements will be followed on permitted sites.**

## COLLECTING SOIL SAMPLES FOR ANALYSIS:

Collect a composite sample for each field (or area of similar soils and management not more than 40 acres in size) comprised of 10 - 15 randomly selected cores. Each core should represent 0 - 6 inches below the surface except for when injection has been done over 6" in depth, then the core should represent the 3-9" layer. Thoroughly mix each set of core samples, and select about a pint of the mixture as the sample for analysis. Label each sample for the field that it represents. Request that the samples be analyzed for nitrate nitrogen, plant-available phosphorus, potassium, sodium, magnesium, calcium, sulfur, boron, conductivity; and pH. Also note on the samples that they are from a poultry litter application area. **TCEQ sampling rules and testing requirements will be followed on permitted sites.** A weighted average of 0-2 and 2-6 inch layers will be used for calculations on permitted sites.

Further information on collecting soil samples can be found on the TCE Form D-494, p 2, TCE Publication No. L-1793, and TCEQ RG-408. Additional NRCS guidance and requirements can be found in the Nutrient Management (590) standard located in the Texas electronic Field Office Technical Guide (eFOTG) at:

[http://efotg.nrcs.usda.gov/efotg\\_locator.aspx?map=TX](http://efotg.nrcs.usda.gov/efotg_locator.aspx?map=TX)

Click the county desired.

Click Section IV in the left column under eFOTG

Type: 590 in the Search Menu above eFOTG and click: **GO**

Click on the desired item under Nutrient Management in the left column

## SOIL ANALYSIS:

A soil analysis will be completed for all areas to be used for all poultry litter application areas. The soil test analysis method will be **Mehlich III by inductively coupled plasma (ICP)**. The area will be tested and analyzed annually to monitor P build up.





# Waste Utilization and Nutrient Management Plan

**Table 1 - Estimated Amount of Waste Produced**

Example Poultry Farm

Avg Number of Birds	Type	Flocks		Pounds Litter/bird/flock
<b>223,004</b>	<b>Broiler</b>	<b>5.0</b>	Litter from Clean-out	<b>1.90</b>
			Litter from Cake	<b>1.12</b>

**Estimated Tons of Litter Produced Annually: 1681**  
**Estimated Total Tons of Cake Litter Produced Annually 624**  
**Estimated Total Tons of Clean-out Litter Produced Annually 1057**

Contact the local Soil and Water Conservation District or USDA Natural Resources Conservation Service office if the total number of birds changes by more than 10% so your plan can be revised.

Estimated Nutrient Availability in Litter			Estimated Nutrient Availability in CAKE		
	pounds/yr	lbs / ton litter **		pounds/yr	lbs / ton litter **
N	N		30,673	N	49
P2O5	P <sub>2</sub> O <sub>5</sub>		45,745	P2O5	73
K2O	K <sub>2</sub> O		36,473	K2O	58
	None Applied		<b>** Cake Value Based on Cake Analysis dated: 04/10/15</b>		

Maximum number birds placed on farm

0.3% of maximum present  Daily mortality in excess of this amount may be considered catastrophic mortality

**Default values were used on all fields for plant removal of nutrients and yield levels.**

# Waste Utilization and Nutrient Management Plan

**TABLE 2. A Nutrient Management Plan (NMP) is required where Soil Test P Level <sup>1/</sup> is:**

- less than 200 ppm statewide or
- or < 350 ppm in arid areas <sup>2/</sup> with a named stream > one mile.

<b>P – Index Rating</b>	<b>Maximum TMDL Annual P Application Rate <sup>5/</sup></b>	<b>Maximum Annual P Application</b>	<b>Maximum Biennial Application Rate</b>
<b>Very Low, Low</b>	Annual Nitrogen (N) Requirement	Annual Nitrogen (N) Requirement	2.0 Times Annual N Requirement
<b>Medium</b>	2.0 Times Annual Crop P Requirement <sup>3/</sup>	2.0 Times Annual Crop P Requirement <sup>3/</sup>	2.0 Times Annual N Requirement
<b>High</b>	1.5 Times Annual Crop P Requirement <sup>3/</sup>	1.5 Times Annual Crop P Requirement <sup>3/</sup>	Double the Maximum Annual P Application Not to Exceed 2 times the Annual N Requirement
<b>Very High</b>	1.0 Times Annual Crop P Requirement <sup>3/</sup>	1.0 Times Annual Crop P Requirement <sup>3/</sup>	Double the Maximum Annual P Application Not to Exceed 2 times the Annual N Requirement

**TABLE 2a. A Nutrient Utilization Plan (NUP) is required by TCEQ where Soil Test P Level <sup>1/</sup> is:**

- equal to or greater than 200 ppm in non-arid areas <sup>2/</sup> or
- equal to or greater than 350 ppm in arid areas <sup>2/</sup> with a named stream greater than one mile or
- equal to or greater than 200 ppm in arid areas <sup>2/</sup> with a named stream less than one mile.

<b>P – Index Rating</b>	<b>Maximum TMDL Annual P Application Rate <sup>5/</sup></b>	<b>Maximum Annual P Application</b>	<b>Maximum Biennial Application Rate</b>
<b>Very Low, Low</b>	1.0 Times Annual Crop P Removal <sup>4/</sup>	Annual N Crop Removal	2.0 Times Annual N Removal
<b>Medium</b>	1.0 Times Annual Crop P Removal <sup>4/</sup>	1.5 Times Annual Crop P Removal <sup>4/</sup>	Double the Maximum Annual P Application Not to Exceed 2 times the Annual N Crop Removal
<b>High</b>	1.0 Times Annual Crop P Removal <sup>4/</sup>	1.0 Times Annual Crop P Removal <sup>4/</sup>	Double the Maximum Annual P Application Not to Exceed 2 times the Annual N Crop Removal
<b>Very High</b> or soil test P <sup>1/</sup> => 500 ppm in nutrient impaired TMDL areas. <sup>5/</sup>	0.5 Times Annual Crop P Removal <sup>4/</sup>	0.5 Times Annual Crop P Removal <sup>4/</sup>	Double the Maximum Annual P Application Not to Exceed 2 times the Annual N Crop Removal

**Footnotes Applicable to both Tables**

- 1/ Soil test P will be Mehlich III by inductively coupled plasma (ICP).
- 2/ Non-arid areas, counties receiving => 25 inches annual rainfall, will use the 200 ppm P level while arid areas, counties receiving < 25 inches of annual rainfall, will use the 350 ppm P level. See map in TX Agronomy Technical Note 15, Phosphorus Assessment Tool for Texas, for county designations.
- 3/ Not to exceed the annual nitrogen requirement rate.
- 4/ Not to exceed the annual nitrogen removal rate.
- 5/ TMDL watersheds are designated by Texas Commission on Environmental Quality (TCEQ).



# Waste Utilization and Nutrient Management Plan

**Table 3 - Crop Removal Rates (For Information Only)**

Example Poultry Farm

LMU or Field No.	Acres	Crop and P Index Level	TCEQ Plan Type	Total Est. N Removal lbs/Ac/Yr	Total Est. P <sub>2</sub> O <sub>5</sub> Removal lbs/Ac/Yr	Total Est. K <sub>2</sub> O Removal lbs/Ac/Yr
1	87.0	Coastal Grazing 1 AU/2 ac M	NMP	169	39	151
3	17.0	Coastal 4 Cut Hay M	NMP	257	80	218
5	28.0	Coastal 4 Cut Hay M	NMP	257	80	218
6	36.0	Coastal 4 Cut Hay M	NMP	257	80	218

**NOTE:** When crops are used for grazing, only a portion of the nutrients used by the crop are removed from the field in the live weight gain of the livestock, the remainder is returned to the land in manure and urine. The book "Southern Forages" estimates the N, P, & K removed in 100 pounds live weight gain as follows: **2.5 lbs N, 0.68 lbs P, 0.15 lbs K**

# Waste Utilization and Nutrient Management Plan

**Table 4 - Maximum Application Rates**

Example Poultry Farm

Est. Annual Litter Production	LMU or Field No.	Acres	Crop Management and PI runoff potential	Current Soil Test P Level (ppm)	Max. Annual P <sub>2</sub> O <sub>5</sub> lbs / Acre	Annual/Biennial	Max Solids Applied tons/Ac	Total Solids / Field (tons)	Litter, Cake, or Both
<b>1681</b>	1	87.0	Coastal Grazing 1 AU/2 ac M	4	140	A	1.9	166.3	Cake
(Tons)	3	17.0	Coastal 4 Cut Hay M	8	340	A	4.6	78.9	Cake
Litter Fed Annually (tons)	5	28.0	Coastal 4 Cut Hay M	27	340	A	4.6	129.9	Cake
	6	36.0	Coastal 4 Cut Hay M	70	340	A	4.6	167.1	Cake
<b>0</b>									
Poultry Type									
<b>Broiler</b>									
Total Application Acres									
<b>168</b>									
Max. Litter &/or Cake to be used on-site (tons)									
<b>542.2</b>									
<b>Not Adequate</b>									
Litter to be used off-site (tons)									
<b>1139</b>									

End of Table 4

# Waste Utilization and Nutrient Management Plan

**TABLE 5 - Nutrients Applied/Needed at Maximum Rates**

Example Poultry Farm

LMU / Field #	Nutrients Applied When Application is at Maximum Rates			Supplemental Nutrients Needed When Application is at Maximum Rates			
	N Lb/ac	P <sub>2</sub> O <sub>5</sub> Lb/ac	K <sub>2</sub> O Lb/ac	N Lb/ac	P <sub>2</sub> O <sub>5</sub> Lb/ac	K <sub>2</sub> O Lb/ac	Lime T/Ac
1	94	140	112	105	0	0	0.5
3	228	340	271	170	0	0	1
5	228	340	271	170	0	0	0
6	228	340	271	165	0	0	0

# Waste Utilization and Nutrient Management Plan

**Table 6 - Planned Application Rates**

Example Poultry Farm

LMU or Field No.	Acres	Crop Management and PI runoff potential	Current Soil Test P ppm	Annual / Biennial	Max Solids Rate tons/ac	% of Maximum to apply	Planned Solids tons/ac	Planned Solids per field (tons)	Tissue Analysis or Default	
1	87.0	Coastal Grazing 1 AU/2 ac M	4	A	1.9	100	1.9	166.3		
3	17.0	Coastal 4 Cut Hay M	8	A	4.6	100	4.6	78.9		
5	28.0	Coastal 4 Cut Hay M	27	A	4.6	100	4.6	129.9		
6	36.0	Coastal 4 Cut Hay M	70	A	4.6	100	4.6	167.1		
Acres		<b>168.0</b>	<b>Will the planned rates use all of the Solids?</b>					542.2		
		<b>1681</b>	<b>Tons of Solids produced Annually</b>					<b>NO</b>		
			<b>Tons to be used off-site at planned rates</b>					<b>1139</b>		

# Waste Utilization and Nutrient Management Plan

**Table 7 - Nutrients Applied/Needed at Planned Rates**

Example Poultry Farm

LMU / Field #	Nutrients Applied at Planned Rates			Supplemental Nutrients Needed at Planned Rates			
	N Lb/ac	P <sub>2</sub> O <sub>5</sub> Lb/ac	K <sub>2</sub> O Lb/ac	N Lb/ac	P <sub>2</sub> O <sub>5</sub> Lb/ac	K <sub>2</sub> O Lb/ac	Lime T/Ac
1	94	140	112	105	0	0	0.5
3	228	340	271	170	0	0	1.0
5	228	340	271	170	0	0	0.0
6	228	340	271	165	0	0	0.0

# Waste Utilization and Nutrient Management Plan

**Table 8 - Non Application Areas by Field**

FS = 393-Filter Strip; FB = 386-Field Border, RFB = 391-Riparian Forest Buffer; OLEA = Other Land Excluded Ar

LMU / Field #	FS Acres	FB Acres	RFB Acres	OLEA Acres	Total Excluded
1	16.0	0.0	0.0	26.0	42.0
3	0.0	0.0	0.0	0.0	
5	0.5	0.0	0.0	0.5	1.0
6	3.0	0.0	0.0	0.0	3.0

LMU / Field #	FS Acres	FB Acres	RFB Acres	OLEA Acres	Total Excluded

**See Application Map for location of buffers**

**Total 590-633 application acres: 168.0**

**Totals 19.5 0.0 0.0 26.5 46.0**

**Total 590-633 Field Acres: 214.0**

WQMP Number

□□□□ - □□□□ - □□□□□□

**CERTIFICATION**

I (We) understand that when these planned Conservation Practices are applied and maintained, the Water Quality Management Plan will meet the State's requirements for water quality. Failure to comply with this plan and implementation schedule will result in the loss of certification. I (We) agree to notify the local Soil and Water Conservation District in the event of deviation from the implementation schedule. Any substitution or changes to the above practices or implementation schedule must be in accordance with the Field Office Technical Guide and approved by the Soil and Water Conservation District.

\_\_\_\_\_  
Applicant (Producer)

\_\_\_\_\_  
Date

The Water Quality Management Plan, as a minimum and in accordance with the Field Office Technical Guide, achieves the quality criteria for the identified priority natural resource concern.

\_\_\_\_\_  
Certified by: Level II Planner

\_\_\_\_\_  
Date

The Water Quality Management Plan includes the operating unit and meets the Soil and Water Conservation District's program, plan and its priorities.

\_\_\_\_\_  
Approved by: Soil and Water Conservation District

\_\_\_\_\_  
Date

The Water Quality Management Plan satisfies the State Board's criteria; complies with Section 26.121 (a) (2) of the Water Code which prohibits the discharge of other waste (agriculture nonpoint source pollution), unless the discharge complies with the person's Certified Water Quality Management Plan approved by the State Soil and Water Conservation Board as provided by Section 201.026 of the Agriculture Code.

\_\_\_\_\_  
Certified by: Texas State Soil and Water Conservation Board

\_\_\_\_\_  
Date





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**\*Section 201.026(g), Agriculture Code**

(g) In an area that the state board identifies as having or having the potential to develop agricultural or silvicultural nonpoint source water quality problems or an area within the "coastal zone" designated by the commissioner of the General Land Office, the state board shall establish a water quality management plan certification program that provides, through local soil and water conservation districts, for the development, supervision, and monitoring of individual water quality management plans for agricultural and silvicultural lands. Each plan must be developed, maintained, and implemented under rules and criteria adopted by the state board and comply with state water quality standards established by the Texas Commission on Environmental Quality. The state board shall certify a plan that satisfies the state board's rules and criteria and complies with state water quality standards established by the Texas Commission on Environmental Quality under the commission's exclusive authority to set water quality standards for all water in the state.

**\*Sec. 26.121(a)(2), Water Code**

(a) Except as authorized by the commission, no person may:

(1) discharge sewage, municipal waste, recreational waste, agricultural waste, or industrial waste into or adjacent to any water in the state;

(2) discharge other waste into or adjacent to any water in the state which in itself or in conjunction with any other discharge or activity causes, continues to cause, or will cause pollution of any of the water in the state, unless the discharge complies with a person's:

(A) certified water quality management plan approved by the State Soil and Water Conservation Board as provided by Section 201.026, Agriculture Code; or

(B) water pollution and abatement plan approved by the commission; or

(3) commit any other act or engage in any other activity which in itself or in conjunction with any other discharge or activity causes, continues to cause, or will cause pollution of any of the water in the state, unless the activity is under the jurisdiction of the Parks and Wildlife Department, the General Land Office, the Department of Agriculture, or the Railroad Commission of Texas, in which case this subdivision does not apply.



**Example Soil and Water Conservation District #xxx**  
4321 Main St. - Example, TX 759xx - Phone (936) xxx-xxxx

## DISTRICT COOPERATIVE AGREEMENT

This agreement is entered into by the Example Soil and Water Conservation District, referred to hereinafter as the "District," and

\_\_\_\_\_ , \_\_\_\_\_ ,

\_\_\_\_\_ , \_\_\_\_\_ ,

referred to hereinafter as the "Cooperator."

### THE DISTRICT AGREES TO:

Assist in carrying out a conservation plan by furnishing to the Cooperator such (1) information, (2) technical assistance and supervision, and (3) other assistance as it may have available at the time the work is to be done.

### THE COOPERATOR AGREES TO:

1. Plan the use of his land within its capabilities.
2. Treat his land in keeping with its needs.
3. Develop a progressive or basic conservation plan.
4. Start applying one or more conservation practices adhering to the technical standards of the District.
5. Maintain all structures and practices established in an effective condition and to continue the use of all other conservation measures put into effect.
6. Use any materials or equipment made available to him by the District for the purpose and in the manner provided for it.

### IT IS FURTHER AGREED THAT:

1. This agreement will become effective on the date of the last signature and may be terminated or modified by mutual agreement of parties hereto.
2. The provisions of this agreement are understood by the Cooperator and the District, and neither shall be liable for damage to the other's property resulting from carrying out this agreement, unless such damage is caused by negligence or misconduct.

### SIGNATURES:

\_\_\_\_\_

\_\_\_\_\_  
(Cooperator)

\_\_\_\_\_

\_\_\_\_\_  
(Date)

\_\_\_\_\_

\_\_\_\_\_  
(Address)

EXAMPLE SOIL AND WATER CONSERVATION DISTRICT #XXX

By \_\_\_\_\_

Date \_\_\_\_\_

**PRIVACY RELEASE**

I, **Producer Name** \_\_\_\_\_ grant permission for the SWCD, TSSWCB, or NRCS to communicate and/or provide any information to the Integrator or USDA-FSA concerning my Water Quality Management Plan (WQMP) # **XXX - XX - XXX** as prescribed in Texas Agriculture Code §201.006(b)(2)(A).

\_\_\_\_\_  
Owner, Owner's Agent, or Tenant Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Witness signature  
(SWCD, TSSWCB, NRCS, or Integrator)

\_\_\_\_\_  
Date



## WQMP STATUS REVIEW POULTRY FARM CHECK LIST



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

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

WQMP No: \_\_\_\_\_

WQMP Reviewer: \_\_\_\_\_

	Circle One
<b>I. WQMP</b>	
1. Does the producer have a copy of the WQMP available on-site?	Yes <b>NO</b>
2. Does the WQMP reflect current operations of the farm?	Yes <b>NO</b>
3. Maximum no. of placed birds on farm: _____ Bird type: _____ Is this farm a CAFO?	Yes No
<b>II. MORTALITY MANAGEMENT</b>	
1. Is an approved method of mortality disposal installed on-site? How many of each: _____ Incinerators   _____ Freezers   _____ Composter   _____ Other (explain)	Yes <b>NO</b>
2. Is the approved method functioning and being used properly?	Yes <b>NO</b>
3. If an incinerator is used, is it registered with TCEQ?	Yes n/a <b>NO</b>
4. Does producer have incinerator registration correspondence from TCEQ?	Yes n/a <b>NO</b>
5. Is there evidence of unauthorized dead bird disposal?	<b>YES</b> No
<b>III. LITTER UTILIZATION AND NUTRIENT MANAGEMENT</b>	
1. Does the Waste Utilization and Nutrient Management Plan (NMP / NUP) reflect current operations of the farm?	Yes <b>NO</b>
2. Is the producer following the requirements of the NMP / NUP?	Yes <b>NO</b>
3. Is litter/manure land-applied on the farm? <b>If yes;</b>	Yes No
a. is it applied in accordance with the NMP / NUP?	Yes n/a <b>NO</b>
b. are filter strip areas (buffers) avoided as required in WQMP?	Yes n/a <b>NO</b>
c. are records available for locations, amounts, rate, and dates of application?	Yes n/a <b>NO</b>
d. are current (<12 mos) soil test records available for LMUs receiving litter? Date of Last Soil Test: _____	Yes n/a <b>NO</b>
4. Does the producer have a current (<12 mos) litter/manure analysis? Date of Last Litter Test: _____	Yes <b>NO</b>
5. Was litter/manure removed from facility and sold or given away for off-site use? <b>If yes,</b> have the following records been kept for two years from date of transfer:	Yes No
a. name/address of the person(s) receiving the litter?	Yes n/a <b>NO</b>
b. physical destination of the litter?	Yes n/a <b>NO</b>
c. dates of removal of litter?	Yes n/a <b>NO</b>
d. amounts of litter removed?	Yes n/a <b>NO</b>
6. Is litter/manure being stored on-farm? <b>If yes;</b>	Yes No
a. is the litter/manure stored under a covered structure; (ie: dry stack facility or appropriately tarped)?	Yes n/a <b>NO</b>
b. if stored uncovered, is litter/manure bermed or otherwise protected so that stormwater runoff contacting litter/manure will not enter water of the state or leave the poultry farm property?	Yes n/a <b>NO</b>
c. if stored uncovered, has storage been more than 30 days?	<b>YES</b> n/a No
d. is the litter/manure storage in an appropriate location - (ie: on suitable soils, >100 ft. from waterways, >150 ft. from wells, and away from neighbors)?	Yes n/a <b>NO</b>
7. Are any discharges observed?	<b>YES</b> No
Comments: _____ _____ _____	
	Producer Signature: _____

# Poultry Data Gathering Sheet

## Certified Water Quality Management Plans

**A. Producers Data:**

Date / Planner: 6-1-15 / MCL

1. Owner / Operator EXAMPLE POULTRY FARM
2. Address FM 123  
EXAMPLE, TX
3. Phone(s) (936) XXX-XXXX ( )
4. Total Farm Acres 269
5. Integrator EXAMPLE POULTRY COMPANY

**B. Poultry Data:**

1. Market Bird Weight 8 avg. in lbs.
2. Bird type (broiler, etc.) Broilers
3. Weeks per flock 9 or days per flock \_\_\_\_\_
4. Flocks 5 number of flocks per year
5. Birds winter 2.5 flocks @ 28,300 number of birds per house per flock  
summer 2.5 flocks @ 28,300 number of birds per house per flock
6. Mortality 3 avg. losses in % or \_\_\_\_\_ avg. losses no. per house
7. Number of houses 8
8. Size of houses 46' x 600'
9. Mortality Management \_\_\_\_\_ Incinerator 1 Composter \_\_\_\_\_ Freezers  
(indicate number of each method used) \_\_\_\_\_ Other (explain) \_\_\_\_\_

Mortality Management existing or proposed (E / P) (P)

**C. Litter Data:**

1. On-site Application (circle one): Litter Only Cake Only Both None
2. Litter Stored ± 350 amount in tons Storage method Litter Barn
3. Litter used for feed 0 amount in tons \_\_\_\_\_



## Average Number of Birds Calculation Sheet for Broilers

### Capacity and Data Information:

Name: Example Poultry Farm

1. Market bird weight = 8.00 lbs
2. Aver. liveweight per bird => ( 0.13 lbs chick wt. + 8.00 lbs market bird weight) / 2 = 4.065 aver. live wt. / bird
3. Weeks per batch = 9
4. No. of batches/yr. = 5.0
5. Aver. mortality = 3.0 % mortality
6. No. of houses = 8
7. Winter birds => ( 2.5 winter batches x 28,300 birds/house) = 70,750 winter birds
8. Summer birds => ( 2.5 summer batches x 28,300 birds/house) = 70,750 summer birds
9. Total birds => ( 70,750 winter birds + 70,750 summer birds) / 5 batches per year  
without mortality  
= 28,300 aver. birds/house x 8 houses = 226,400 birds/batch
10. No. dead birds => 226,400 Total birds w/o mortality x 3 % mortality = 6,792 dead birds
11. Market birds => 226,400 Total birds w/o mortality - 6,792 dead birds = 219,608 market birds per batch
12. Average Total Birds:  
(#9 + #11) / 2 => ( 226,400 + 219,608 ) / 2 = 223,004 aver. total birds per batch
13. Maximum Total Placed Birds:  
[(higher of either cell G20 or G22) x #6] =>  
( 28300 x 8 ) = 226,400 max. total placed birds per batch for determining CAFO status

# Waste Utilization and Nutrient Management Data Entries

Farmer Name : Example Poultry Farm  
County in which the Land is located :  
Type of Waste Plan : Dry Poultry  
Is this plan in a TMDL watershed for nutrients?  
Yes or No : No  
Is any field PERMITTED by TCEQ?  
Yes or No : No  
Permit # :

All other entries on General Page appear on the Cover Page

## Litter Information

Date of Litter Analysis : 4/10/2015  
Source of Litter : Broiler  
Is this a new oper. with no litter or cake to test? : No  
Nitrogen % From Analysis :  
Phosphorus % From Analysis :  
Potassium % From Analysis :  
Dry Matter % From Analysis :  
Calculated Moisture % : 100  
Tons of Litter Used for Feed : 0  
Is this Farm a part of a Poultry Operation? : Yes

## Cake Information

Date of CAKE Analysis : 4/10/2015  
Is Cake being applied to any field? : Yes  
Nitrogen % From Analysis : 3.57  
Phosphorus % From Analysis : 1.86  
Potassium % From Analysis : 2.83  
Dry Matter % From Analysis : 86  
Calculated Moisture % : 14  
Tons of Litter Used for Feed : 0

## Bird Information

Market Bird Weight: 8  
Weeks per Batch: 9  
Number Batches per yr.: 5  
Number Winter Batches: 2.5  
Number Summer Batches: 2.5  
Number Days/yr Birds in Houses: 315  
Average Mortality %: 3  
Number of Houses: 8  
Average Size of Houses: 46' x 600'  
Number Birds per House per Batch - Winter: 28300  
Number Birds per House per Batch - Summer: 28300  
Dead Bird Disposal Method: Composter

This plan is based on: rganic Nutrient Management Plan V 5.0



# PI Index by Field

Printed on: 6/15/15 8:17 AM  
 Client Name: Example Poultry Farm  
 Planner: Mark Cochran

This plan is based on: Nutrient Management Plan V 5.0  
 Date: 6/15/2015  
 Location: Anderson  
 Rainfall: >25.0 inches

Example Poultry Farm

LMU or Fields	Crop	Slope	Runoff Curve	Soil Test P Level	Inorganic P <sub>2</sub> O <sub>5</sub> Appl Rate	Organic P <sub>2</sub> O <sub>5</sub> Appl Rate	Inorganic Method & Timing	Organic Method & Timing	Proximity of Appl to Named Stream	Runoff Class	Soil Erosion	Total Index Points	P Runoff Potential	Soil Test Date:
1	Coastal Grazing 1 AU/2 ac	4.0%	74	1	0	3	0	4	10	2	0	20	Medium	4/30/15
3	Coastal 4 Cut Hay	4.0%	78	1	0	6	0	4	1.25	2	0	14.25	Medium	4/30/15
5	Coastal 4 Cut Hay	1.0%	78	2	0	6	0	4	2.5	2	0	16.5	Medium	4/30/15
6	Coastal 4 Cut Hay	1.0%	78	8	0	3	0	4	5	2	0	22	Medium	4/30/15

	A	B	C	D	E	F	G
3	Client Name: <b>Example Poultry Farm</b>		Crop: <b>Coastal Grazing 1 AU/2 ac</b>				
4	Planner: <b>Mark Cochran</b>		LMU or Field(s): <b>1</b>				
5	Rainfall: <b>&gt;25.0 inches</b>		Slope (%): <b>4.0%</b>				
6	Location:		Runoff Curve No.: <b>74</b>		Soil Test Date: <b>4/30/2015</b>		
7	<b>Site Characteristic</b>	<b>Place an X in the appropriate box for each of the Site Characteristic listed below.</b>					<b>Sub Total</b>
8	<b>Soil Test P Level</b>	N/A	Very Low -Low	Moderate	High	Very High	
9			<b>X</b>				1.00
10	<b>Phosphorus Fertilizer (P<sub>2</sub>O<sub>5</sub>) Application Rate</b>	None Applied	1-40 lbs/ac P <sub>2</sub> O <sub>5</sub>	41-90 lbs/ac P <sub>2</sub> O <sub>5</sub>	91-150 lbs/ac P <sub>2</sub> O <sub>5</sub>	>150 lbs/ac P <sub>2</sub> O <sub>5</sub>	
11		<b>X</b>					0.00
12	<b>Organic Phosphorus (P<sub>2</sub>O<sub>5</sub>) Application Rate</b>	None Applied	1-40 lbs/ac P <sub>2</sub> O <sub>5</sub>	41-90 lbs/ac P <sub>2</sub> O <sub>5</sub>	91-150 lbs/ac P <sub>2</sub> O <sub>5</sub>	>150 lbs/ac P <sub>2</sub> O <sub>5</sub>	
13					<b>X</b>		3.00
14	<b>Phosphorus Fertilizer Application Method and Timing</b>	None Applied	Placed Deeper than 2 in. or broadcast with incorporation within 48 hrs.*	Surface applied only between 12/1 - 2/15	Surface applied only during the period 6/16 - 4/15	Surface Applied 1/1 -12/31	
15		<b>X</b>					0.00
16	<b>Organic Phosphorus Source Application Method and Timing</b>	None Applied	Placed Deeper than 2 in. or broadcast with incorporation within 48 hrs.*	Surface applied only between 12/1 - 2/15	Surface applied only during the period 6/16 - 4/15	Surface Applied 1/1 -12/31	
17						<b>X</b>	4.00
18	<b>Proximity of Nearest Field Application Area to Named Stream or Lake</b>	Very Low >2000 feet	Low 1000 - 1999 feet	Medium 500 - 999 feet	High 100 - 499 feet	Very High <100 feet	
19						<b>X</b>	10.00
20	<b>Runoff Class (Runoff Class Table)</b>	Negligible	Very Low or Low	Moderate	High	Very High	
21				<b>X</b>			2.00
22	<b>Soil Erosion (All Sources)</b>	Very Low <1 t/ac	Low 1-3 t/ac	Medium 3-5 t/ac	High 5-10 t/ac	Very High >10 t/ac	
23		<b>X</b>					0.00
24	<b>Total Index Points:</b>						<b>20.00</b>
25	<b>P Runoff Potential:</b>						<b>Medium</b>
26							
27	<b>Phosphorus Index Classification</b>						
28	<b>Index Pts.</b>		<b>P Runoff Potential</b>				
29	<12		Very Low - Low				
30	12 - 22.75		Medium				
31	23 - 32		High				
32	> 32		Very High				
33							
34	* If using effluent with less than 2% solids (applied through a center pivot), the Organic Phosphorus Source Application and Timing, would be considered equivalent to "Placed deeper than 2 inches or broadcast and incorporated within 48 hours". If using effluent with 2% or more solids, not followed up with clear water, or not diluted to less than 2% solids, the Organic Phosphorus Source Application and Timing, would be considered as any other appropriate application category.						
35							
36							

	A	B	C	D	E	F	G
3	Client Name: <b>Example Poultry Farm</b>		Crop: <b>Coastal 4 Cut Hay</b>				
4	Planner: <b>Mark Cochran</b>		LMU or Field(s): <b>3</b>				
5	Rainfall: <b>&gt;25.0 inches</b>		Slope (%): <b>4.0%</b>				
6	Location:		Runoff Curve No.: <b>78</b>		Soil Test Date: <b>4/30/2015</b>		
7	Site Characteristic	Place an X in the appropriate box for each of the Site Characteristic listed below.					Sub Total
8	Soil Test P Level	N/A	Very Low -Low	Moderate	High	Very High	
9			X				1.00
10	Phosphorus Fertilizer (P <sub>2</sub> O <sub>5</sub> ) Application Rate	None Applied	1-40 lbs/ac P <sub>2</sub> O <sub>5</sub>	41-90 lbs/ac P <sub>2</sub> O <sub>5</sub>	91-150 lbs/ac P <sub>2</sub> O <sub>5</sub>	>150 lbs/ac P <sub>2</sub> O <sub>5</sub>	
11		X					0.00
12	Organic Phosphorus (P <sub>2</sub> O <sub>5</sub> ) Application Rate	None Applied	1-40 lbs/ac P <sub>2</sub> O <sub>5</sub>	41-90 lbs/ac P <sub>2</sub> O <sub>5</sub>	91-150 lbs/ac P <sub>2</sub> O <sub>5</sub>	>150 lbs/ac P <sub>2</sub> O <sub>5</sub>	
13						X	6.00
14	Phosphorus Fertilizer Application Method and Timing	None Applied	Placed Deeper than 2 in. or broadcast with incorporation within 48 hrs.*	Surface applied only between 12/1 - 2/15	Surface applied only during the period 6/16 - 4/15	Surface Applied 1/1 -12/31	
15		X					0.00
16	Organic Phosphorus Source Application Method and Timing	None Applied	Placed Deeper than 2 in. or broadcast with incorporation within 48 hrs.*	Surface applied only between 12/1 - 2/15	Surface applied only during the period 6/16 - 4/15	Surface Applied 1/1 -12/31	
17						X	4.00
18	Proximity of Nearest Field Application Area to Named Stream or Lake	Very Low >2000 feet	Low 1000 - 1999 feet	Medium 500 - 999 feet	High 100 - 499 feet	Very High <100 feet	
19			X				1.25
20	Runoff Class (Runoff Class Table)	Negligible	Very Low or Low	Moderate	High	Very High	
21				X			2.00
22	Soil Erosion (All Sources)	Very Low <1 t/ac	Low 1-3 t/ac	Medium 5 t/ac	High 5-10 t/ac	Very High >10 t/ac	
23		X					0.00
24	<b>Total Index Points:</b>						<b>14.25</b>
25	P Runoff Potential:		<b>Medium</b>				
27	<b>Phosphorus Index Classification</b>						
28	<b>Index Pts.</b>		<b>P Runoff Potential</b>				
29	<12		Very Low - Low				
30	12 - 22.75		Medium				
31	23 - 32		High				
32	> 32		Very High				
34	<p>* If using effluent with less than 2% solids (applied through a center pivot), the Organic Phosphorus Source Application and Timing, would be considered equivalent to "Placed deeper than 2 inches or broadcast and incorporated within 48 hours". If using effluent with 2% or more solids, not followed up with clear water, or not diluted to less than 2% solids, the Organic Phosphorus Source Application and Timing, would be considered as any other appropriate application category.</p>						

	A	B	C	D	E	F	G
3	Client Name:	Example Poultry Farm			Crop:	Coastal 4 Cut Hay	
4	Planner:	Mark Cochran	LMU or Field(s):	5			
5	Rainfall:	>25.0 inches	Slope (%):	1.0%			
6	Location:	Runoff Curve No.:			78	Soil Test Date:	4/30/2015
7	Site Characteristic	Place an X in the appropriate box for each of the Site Characteristic listed below.					Sub Total
8	Soil Test P Level	N/A	Very Low -Low	Moderate	High	Very High	
9				X			2.00
10	Phosphorus Fertilizer (P <sub>2</sub> O <sub>5</sub> ) Application Rate	None Applied	1-40 lbs/ac P <sub>2</sub> O <sub>5</sub>	41-90 lbs/ac P <sub>2</sub> O <sub>5</sub>	91-150 lbs/ac P <sub>2</sub> O <sub>5</sub>	>150 lbs/ac P <sub>2</sub> O <sub>5</sub>	
11		X					0.00
12	Organic Phosphorus (P <sub>2</sub> O <sub>5</sub> ) Application Rate	None Applied	1-40 lbs/ac P <sub>2</sub> O <sub>5</sub>	41-90 lbs/ac P <sub>2</sub> O <sub>5</sub>	91-150 lbs/ac P <sub>2</sub> O <sub>5</sub>	>150 lbs/ac P <sub>2</sub> O <sub>5</sub>	
13						X	6.00
14	Phosphorus Fertilizer Application Method and Timing	None Applied	Placed Deeper than 2 in. or broadcast with incorporation within 48 hrs.*	Surface applied only between 12/1 - 2/15	Surface applied only during the period 6/16 - 4/15	Surface Applied 1/1 -12/31	
15		X					0.00
16	Organic Phosphorus Source Application Method and Timing	None Applied	Placed Deeper than 2 in. or broadcast with incorporation within 48 hrs.*	Surface applied only between 12/1 - 2/15	Surface applied only during the period 6/16 - 4/15	Surface Applied 1/1 -12/31	
17						X	4.00
18	Proximity of Nearest Field Application Area to Named Stream or Lake	Very Low >2000 feet	Low 1000 - 1999 feet	Medium 500 - 999 feet	High 100 - 499 feet	Very High <100 feet	
19				X			2.50
20	Runoff Class (Runoff Class Table)	Negligible	Very Low or Low	Moderate	High	Very High	
21				X			2.00
22	Soil Erosion (All Sources)	Very Low <1 t/ac	Low 1-3 t/ac	Medium 3-5 t/ac	High 5-10 t/ac	Very High >10 t/ac	
23		X					0.00
24							<b>Total Index Points: 16.50</b>
25	P Runoff Potential: <span style="border: 1px solid black; padding: 2px;">Medium</span>						
26							
27	<b>Phosphorus Index Classification</b>						
28	<b>Index Pts.</b>		<b>P Runoff Potential</b>				
29	<12		Very Low - Low				
30	12 - 22.75		Medium				
31	23 - 32		High				
32	> 32		Very High				
33							
34	* If using effluent with less than 2% solids (applied through a center pivot), the Organic Phosphorus Source Application and Timing, would be considered equivalent to "Placed deeper than 2 inches or broadcast and incorporated within 48 hours". If using effluent with 2% or more solids, not followed up with clear water, or not diluted to less than 2% solids, the Organic Phosphorus Source Application and Timing, would be considered as any other appropriate application category.						
35							
36							

	A	B	C	D	E	F	G
3	Client Name:	Example Poultry Farm		Crop:	Coastal 4 Cut Hay		
4	Planner:	Mark Cochran	LMU or Field(s):	6			
5	Rainfall:	>25.0 inches	Slope (%):	1.0%			
6	Location:	Runoff Curve No.:		78	Soil Test Date:	4/30/2015	
7	Site Characteristic	Place an X in the appropriate box for each of the Site Characteristic listed below.					Sub Total
8	Soil Test P Level	N/A	Very Low -Low	Moderate	High	Very High	
9						X	8.00
10	Phosphorus Fertilizer (P <sub>2</sub> O <sub>5</sub> ) Application Rate	None Applied	1-40 lbs/ac P <sub>2</sub> O <sub>5</sub>	41-90 lbs/ac P <sub>2</sub> O <sub>5</sub>	91-150 lbs/ac P <sub>2</sub> O <sub>5</sub>	>150 lbs/ac P <sub>2</sub> O <sub>5</sub>	
11		X					0.00
12	Organic Phosphorus (P <sub>2</sub> O <sub>5</sub> ) Application Rate	None Applied	1-40 lbs/ac P <sub>2</sub> O <sub>5</sub>	41-90 lbs/ac P <sub>2</sub> O <sub>5</sub>	91-150 lbs/ac P <sub>2</sub> O <sub>5</sub>	>150 lbs/ac P <sub>2</sub> O <sub>5</sub>	
13					X		3.00
14	Phosphorus Fertilizer Application Method and Timing	None Applied	Placed Deeper than 2 in. or broadcast with incorporation within 48 hrs.*	Surface applied only between 12/1 - 2/15	Surface applied only during the period 6/16 - 4/15	Surface Applied 1/1 -12/31	
15		X					0.00
16	Organic Phosphorus Source Application Method and Timing	None Applied	Placed Deeper than 2 in. or broadcast with incorporation within 48 hrs.*	Surface applied only between 12/1 - 2/15	Surface applied only during the period 6/16 - 4/15	Surface Applied 1/1 -12/31	
17						X	4.00
18	Proximity of Nearest Field Application Area to Named Stream or Lake	Very Low >2000 feet	Low 1000 - 1999 feet	Medium 500 - 999 feet	High 100 - 499 feet	Very High <100 feet	
19					X		5.00
20	Runoff Class (Runoff Class Table)	Negligible	Very Low or Low	Moderate	High	Very High	
21				X			2.00
22	Soil Erosion (All Sources)	Very Low <1 t/ac	Low 1-3 t/ac	Medium 3-5 t/ac	High 5-10 t/ac	Very High >10 t/ac	
23		X					0.00
24	<b>Total Index Points:</b>						<b>22.00</b>
25	P Runoff Potential: <span style="border: 1px solid black; padding: 2px;">Medium</span>						
26							
27	<b>Phosphorus Index Classification</b>						
28	<b>Index Pts.</b>		<b>P Runoff Potential</b>				
29	<12		Very Low - Low				
30	12 - 22.75		Medium				
31	23 - 32		High				
32	> 32		Very High				
33							
34	* If using effluent with less than 2% solids (applied through a center pivot), the Organic Phosphorus Source Application and Timing, would be considered equivalent to "Placed deeper than 2 inches or broadcast and incorporated within 48 hours". If using effluent with 2% or more solids, not followed up with clear water, or not diluted to less than 2% solids, the Organic Phosphorus Source Application and Timing, would be considered as any other appropriate application category.						
35							
36							

Stephen F. Austin State University  
 Soil, Plant & Water Analysis Laboratory  
 PO Box 13025  
 Nacogdoches, TX 75962  
 (936) 468-4500



April 10, 2015

EXAMPLE POULTRY FARM  
 FM 123  
 EXAMPLE, TX

**Elemental Analysis (Total)**

<i>Lab Number</i>	L
<i>Sample ID</i>	1
<i>Sample Material</i>	BROILERS
<b><u>Element</u></b>	<b>Concentration - Oven Dry Basis</b>
<i>N - Nitrogen (%)</i>	3.57
<i>C - Carbon (%)</i>	NA
<i>CN: Ratio</i>	NA
<i>P - Phosphorus (%)</i>	1.86
<i>K - Potassium (%)</i>	2.83
<i>Ca - Calcium (%)</i>	3.36
<i>Mg - Magnesium (%)</i>	0.66
<i>S - Sulfur (%)</i>	0.94
<i>Na - Sodium (%)</i>	1.31
<i>Fe - Iron (ppm)</i>	1,038
<i>Mn - Manganese (ppm)</i>	251
<i>Zn - Zinc (ppm)</i>	327
<i>Cu - Copper (ppm)</i>	444

**As spread basis**

<i>Moisture (%)</i>	14
<i>N (lbs/ton as spread)</i>	61
<i>P<sub>2</sub>O<sub>5</sub> (lbs/ton as spread)</i>	73
<i>K<sub>2</sub>O (lbs/ton as spread)</i>	58

NA = not available

J. Leon Young, Ph.D.  
 Lab Director

**SOIL, PLANT AND WATER ANALYSIS LABORATORY**  
**STEPHEN F. AUSTIN STATE UNIVERSITY**  
**PO BOX 13025 • NACOGDOCHES, TX 75962**  
**(936) 468-4500**

**SOIL TEST REPORT**

4/30/2015

**CUSTOMER:**

**COUNTY:**

**SOIL TEST RESULTS**

Lab No.	Sender's Sample No.	Soil pH	Nitrate Nitrogen ppm	Phosphorus P		Potassium K		Calcium Ca		Magnesium Mg		Salinity Hazard	Sulfate Sulfur level	Iron level	Manganese level	Zinc level	Copper level
				ppm *	level	ppm*	level	ppm*	level	ppm*	level						
	1	5.9	1	4	VL	45	VL	352	L	65	L	VL	VL				

\*The values for ppm (parts per million) are based on testing procedures used at the SFA Laboratory and may differ from results obtained by other procedures. The level of very low, low, etc. is more important than ppm, since these levels indicate the probability of response to added plant nutrients. A very low level indicates a high probability of benefit from added plant nutrients. VL=Very Low; L=Low; M=Medium; H=High; VH=Very High

**RECOMMENDATIONS**

Sample No.	Crop	Limestone Tons of ECCE/Acre	pounds of plant nutrient per acre			REMARKS
			N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
	COASTAL	0.5	100	30	60	For 1 hay cutting of about 2 tons/A. For additional cuttings, add 100 lbs. of nitrogen per acre after each cutting.***Any recommended P2O5 can be applied all at once. If any P2O5 is recommended, apply an additional 20 lbs of P2O5 for each additional cutting.***Reapply recommended amount of K2O for each additional cutting. Do not apply more than 90 lbs. of K2O for each additional cutting. If K2O recommendation is zero and more than two hay cuttings are desired, apply 50 lbs. of K2O per acre after the second cutting.***For grazing in addition to hay cuttings: Apply 70 lbs. of nitrogen/A after the last cutting for grazing 1 A.U./2A.

**Limestone:** Apply any recommended limestone as soon as possible. If limestone is recommended and the magnesium (Mg) level is low or very low, the soil would benefit from the use of limestone containing at least 3% Mg. For a quicker Mg response, you may apply 200 to 250 lbs per acre of potassium magnesium sulfate ("Sul-Po-Mag" or "K-Mag"). This material is also 22% K<sub>2</sub>O and 22% S. The K<sub>2</sub>O and S should be applied to your K<sub>2</sub>O and/or S requirements.

If you have questions about this report, contact your County Agriculture Extension Agent, NRCS personnel or your fertilizer dealer.

Recommended by J. Leon Young

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**SOIL TEST REPORT**

4/30/2015

**CUSTOMER:**

**COUNTY:**

**SOIL TEST RESULTS**

Lab No.	Sender's Sample No. <i>Field</i>	Soil pH	Nitrate Nitrogen ppm	Phosphorus P		Potassium K		Calcium Ca		Magnesium Mg		Salinity Hazard	Sulfate Sulfur level	Iron level	Manganese level	Zinc level	Copper level	
				ppm *	level	ppm*	level	ppm*	level	ppm*	level							
	3	5.27	1	8	VL	38	VL	295	L	47	VL	VL	VL					

\*The values for ppm (parts per million) are based on testing procedures used at the SFA Laboratory and may differ from results obtained by other procedures. The level of very low, low, etc. is more important than ppm, since these levels indicate the probability of response to added plant nutrients. A very low level indicates a high probability of benefit from added plant nutrients. VL=Very Low; L=Low; M=Medium; H=High; VH=Very High

**RECOMMENDATIONS**

Sample No.	Crop	Limestone Tons of ECCE/Acre	pounds of plant nutrient per acre			REMARKS
			N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
	COASTAL	1	100	30	60	For 1 hay cutting of about 2 tons/A. For additional cuttings, add 100 lbs. of nitrogen per acre after each cutting.*** Any recommended P2O5 can be applied all at once. If any P2O5 is recommended, apply an additional 20 lbs of P2O5 for each additional cutting.***Reapply recommended amount of K2O for each additional cutting. Do not apply more than 90 lbs. of K2O for each additional cutting. If K2O recommendation is zero and more than two hay cuttings are desired, apply 50 lbs. of K2O per acre after the second cutting. **For grazing in addition to hay cuttings: Apply 70 lbs. of nitrogen/A after the last cutting for grazing 1 A.U./2A.

**Limestone:** Apply any recommended limestone as soon as possible. If limestone is recommended and the magnesium (Mg) level is low or very low, the soil would benefit from the use of limestone containing at least 3% Mg. For a quicker Mg response, you may apply 200 to 250 lbs per acre of potassium magnesium sulfate ("Sul-Po-Mag" or "K-Mag"). This material is also 22% K<sub>2</sub>O and 22% S. The K<sub>2</sub>O and S should be applied to your K<sub>2</sub>O and/or S requirements.

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**SOIL TEST REPORT**

4/30/2015

CUSTOMER:

COUNTY: 2

**SOIL TEST RESULTS**

Lab No.	Sender's Sample No.	Soil pH	Nitrate Nitrogen ppm	Phosphorus P		Potassium K		Calcium Ca		Magnesium Mg		Salinity Hazard	Sulfate Sulfur level	Iron level	Manganese level	Zinc level	Copper level
				ppm *	level	ppm*	level	ppm*	level	ppm*	level						
	5	6.18	1	27	M	41	VL	204	L	26	VL	VL	VL				

\*The values for ppm (parts per million) are based on testing procedures used at the SFA Laboratory and may differ from results obtained by other procedures. The level of very low, low, etc. is more important than ppm, since these levels indicate the probability of response to added plant nutrients. A very low level indicates a high probability of benefit from added plant nutrients. VL=Very Low; L=Low; M=Medium; H=High; VH=Very High

**RECOMMENDATIONS**

Sample No.	Crop	Limestone Tons of ECCE/Acre	pounds of plant nutrient per acre			REMARKS
			N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
	COASTAL	0	30	80	90	Apply fertilizer at planting. Four to six weeks after planting, and every 4-6 weeks thereafter, apply 50 lbs of N/A if rains persist. This will encourage rapid grass establishment. Be sure to control weeds. Then after sod becomes established, use 60 lbs/A of N per grazing period or 80-100 lbs/A of N per hay cutting (2 tons/A).

**Limestone:** Apply any recommended limestone as soon as possible. If limestone is recommended and the magnesium (Mg) level is low or very low, the soil would benefit from the use of limestone containing at least 3% Mg. For a quicker Mg response, you may apply 200 to 250 lbs per acre of potassium magnesium sulfate ("Sul-Po-Mag" or "K-Mag"). This material is also 22% K<sub>2</sub>O and 22% S. The K<sub>2</sub>O and S should be applied to your K<sub>2</sub>O and/or S requirements.

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Recommended by J. Leon Young

# SOIL, PLANT AND WATER ANALYSIS LABORATORY

STEPHEN F. AUSTIN STATE UNIVERSITY

PO BOX 13025 • NACOGDOCHES, TX 75962

(936) 468-4500

## SOIL TEST REPORT

4/30/2015

CUSTOMER:

COUNTY:

### SOIL TEST RESULTS

Lab No.	Sender's Sample No.	Soil pH	Nitrate Nitrogen ppm	Phosphorus P		Potassium K		Calcium Ca		Magnesium Mg		Salinity Hazard	Sulfate Sulfur level	Iron level	Manganese level	Zinc level	Copper level
				ppm *	level	ppm*	level	ppm*	level	ppm*	level						
	1-2-1-1-6	6.27	3	70	VH	74	L	390	L	41	VL	VL	VL				

\*The values for ppm (parts per million) are based on testing procedures used at the SFA Laboratory and may differ from results obtained by other procedures. The level of very low, low, etc. is more important than ppm, since these levels indicate the probability of response to added plant nutrients. A very low level indicates a high probability of benefit from added plant nutrients. VL=Very Low; L=Low; M=Medium; H=High; VH=Very High

### RECOMMENDATIONS

Sample No.	Crop	Limestone Tons of ECCE/Acre	pounds of plant nutrient per acre			REMARKS
			N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
	COASTAL	0	55	0	55	For grazing 1 A.U./2 A. If recommended nitrogen amount is greater than 60 lbs/A, split the N into 2 applications. Apply the full amounts of any recommended P2O5 or K2O. For additional grazing through the season, apply 60 lbs of nitrogen/A after every grazing period.

**Limestone:** Apply any recommended limestone as soon as possible. If limestone is recommended and the magnesium (Mg) level is low or very low, the soil would benefit from the use of limestone containing at least 3% Mg. For a quicker Mg response, you may apply 200 to 250 lbs per acre of potassium magnesium sulfate ("Sul-Po-Mag" or "K-Mag"). This material is also 22% K<sub>2</sub>O and 22% S. The K<sub>2</sub>O and S should be applied to your K<sub>2</sub>O and/or S requirements.

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Recommended by J. Leon Young



# Texas State Soil & Water Conservation Board

NOVEMBER 1, 2009

## Supplemental Guidance to Water Quality Management Plans

### For All Dry-Litter Poultry Operations

#### BACKGROUND

Historically the federal Concentrated Animal Feeding Operation (CAFO) regulations under the Clean Water Act, administered by the U.S. Environmental Protection Agency (EPA), have not included dry-litter poultry operations. Dry-litter operations were considered “nonpoint” sources, and were therefore not regulated through permits. In 2001, the Texas Legislature passed Senate Bill 1339 requiring **all** poultry operations that were not already required to be regulated under a permit, to implement and maintain a Water Quality Management Plan (WQMP) certified by the Texas State Soil and Water Conservation Board (TSSWCB). In 2003, the EPA revised the federal CAFO rules to define as CAFOs all dry-litter poultry operations that confine 125,000 or more broilers or pullets, 82,000 or more layers or breeders, or 55,000 turkeys for 45-days out of a year. Since the EPA has delegated the administration of the federal CAFO regulations to the Texas Commission on Environmental Quality (TCEQ), the rules in Texas were revised to be consistent with the Federal CAFO regulations. The Texas CAFO rules also designate animal feeding operations as CAFOs in certain counties at lower head count numbers than in the rest of the state. These rules define dry-litter poultry operations as CAFOs in Erath, Bosque, Hamilton, Comanche, Johnson, Hopkins, Wood, or Rains counties when 37,500 or more broilers or pullets, 25,000 or more layers or breeders, or 16,500 turkeys are confined for 45-days out of a year.

#### NON-PERMIT OPTION

As a result of a federal court decision in 2005, and a subsequent change to the Texas CAFO rules in 2006, dry-litter poultry CAFOs as defined above that do not discharge and do not plan to discharge pollutants to water in the state are **not** required to obtain permit coverage from TCEQ. However, because they are still defined as CAFOs, they must comply with certain requirements in the Texas CAFO rules (Title 30, Texas Administrative Code, Chapter 321, Subchapter B). They must also obtain, implement, and maintain a Water Quality Management Plan certified by the Texas State Soil and Water Conservation Board. The content of this document

provides poultry producers with the information necessary to comply with the CAFO rules without obtaining coverage under the general permit. However, if a producer wishes to obtain coverage under the general permit, there is a separate guidance document available from TSSWCB for information on that process.

#### RULE COMPLIANCE

All poultry producer’s Water Quality Management Plan (WQMP) certified by the Texas State Soil and Water Conservation Board meets most of the requirements of the CAFO rules. By implementing the following general guidance and the specific guidance in the Water Quality Management Plan (WQMP), all poultry producers can meet the requirements of the CAFO rules and the WQMP Program. **Failure to comply with this document and the WQMP requirements by a poultry facility could result in loss of WQMP certification, penalties, and requirement to obtain permit coverage from TCEQ.**

#### *Mortality Management*

All poultry facilities are required by law to manage mortality losses in accordance with Title 30 Texas Administrative Code, Chapter 335, Rule §335.25, *Handling, Storing, Processing, Transporting, and Disposing of Poultry Carcasses*. Specific guidance is included in each facility’s WQMP. **Dumping or burial of carcasses for routine disposal is prohibited by law.** Burial is allowed only in case of catastrophic losses that exceed 0.3% per day of total flock inventory. Guidance for catastrophic losses specific to a particular farm is also included in the WQMP.

#### TEXAS STATE

#### SOIL & WATER CONSERVATION BOARD

P.O. BOX 658 / 4311 SOUTH 31<sup>ST</sup> STREET, SUITE 125

TEMPLE, TEXAS 76503

PHONE (254) 773-2250, FAX (254) 773-3311

<http://www.tsswcb.state.tx.us>

## **Annual Soil Samples**

For land application fields owned, operated, controlled, rented, or leased by the poultry producer, the poultry producer must follow the soil sampling requirements of the WQMP which requires a soil sample from 0-6 inches annually from each field where poultry litter will be land applied during the upcoming year. Sampling is not required on fields where litter will not be applied in the upcoming year. However, samples must be collected and analyzed and the WQMP updated prior to resuming litter application to those fields. Annual soil samples shall be collected at least several weeks prior to land application of litter and composed of 10-15 sub-samples taken randomly throughout each application field and mixed thoroughly to create each composite sample. Each composite sample must be submitted to and analyzed by an approved soil-testing laboratory using the Mehlich III method for phosphorus. The results should be provided to TSSWCB to determine litter application rates for the nutrient management plan.

## **Annual Litter Samples**

Litter samples shall be collected annually, regardless of whether or not litter will be cleaned out that year. Representative samples should be collected from each house on the farm and combined into one composite sample and submitted to the laboratory for analysis. If litter will be land applied, samples should be collected at least several weeks prior to land application to allow time for returned laboratory results. Those results should be made available to any off-site users of the litter and should be provided to TSSWCB for use in updating the nutrient management plan.

## **Use of Poultry Litter**

Poultry litter is typically land applied as a soil amendment/nutrient supplement on hay or pasture fields. No less than 100 feet of well vegetated ground cover shall be maintained between manure/litter application areas and creeks, streams, ponds, lakes, and other water ways and no less than 150 feet for private water wells and 500 feet for public water wells. Application rates must be in accordance with the nutrient management plan included in the WQMP. Site-specific information is found in the WQMP.

## **Storage of Poultry Litter**

It is highly recommended that litter be stored in a roofed litter storage facility, preferably one that meets the design criteria of the Natural Resource Conservation Service's (NRCS) Waste Storage Facility-Code 313. Outdoor uncovered litter storage is discouraged, but if litter is stored unroofed, it shall not exceed 30 days, and the litter must be covered with impermeable material, protected from external rainfall, or bermed to protect from runoff. Runoff from litter storage piles must be retained on site. Site-specific information is included in the WQMP.

## **Water Wells**

Litter application or mortality burial shall not be within 150 feet of private wells or 500 feet of public wells. Maps within the WQMP should clearly identify all wells and buffer zones. A licensed water-well driller must perform the construction of new water-wells and all abandoned and unusable wells must be plugged in accordance with Texas Administrative Code, Title 16, Chapter 76, and any technical or record keeping requirements of the local Ground Water Conservation District.

## **Spill Prevention and Recovery**

The poultry producer is responsible for taking appropriate measures to prevent spills and responsible for cleaning up spills of any toxic pollutant. A poultry producer's integrator company may have specific measures for addressing such situations and should be consulted for guidance.

## **Air Quality Authorization**

All poultry CAFOs are required to operate under an Air Quality Authorization. In accordance with Texas Administrative Code, Title 30, Chapter 106, Rule §106.161(7), all housed poultry operations are authorized by rule when wood shavings or similar material is used as bedding in litter.

## **Discharge Notification, Monitoring, and Analysis**

The CAFO producer electing not to obtain coverage under the general permit can not discharge any pollutants to water in the state. If a discharge occurs, the CAFO producer is subject to penalties and permitting and the CAFO producer is responsible for

notifying TCEQ, taking samples, and obtaining analyses of all discharges of pollutants to surface water in the state. Refer to §321.44(a) & (b) of the CAFO rules if this circumstance occurs. However, if the poultry producer is following the guidance in the WQMP, discharges to water in the state from the poultry facility should not occur.

## Record Keeping

The poultry producer must keep records for at least 5 years from the date the record was created. Records which must be kept include:

- Water Quality Management Plan which includes a nutrient management plan;
- Soil sampling locations and analyses, updated annually at least a few weeks prior to litter application;
- Annual litter analyses, updated a few weeks prior to litter clean-out, or at other time each year if no clean-out planned;
- A log of amounts of all litter/cake and manure utilized on-farm showing dates, locations, acres, and weather conditions during land application 24 hours before and after land application;
- A log, for at least the last 2 years, of name and address of off-site recipient(s) of poultry litter, physical destination of the litter, date(s) litter was removed from facility, and amount of litter removed from facility;

These records should be available for review upon site inspection of the facility.

## Poultry Site Inspections

The poultry producer must inspect the facilities on a regular basis. Mortality management systems, litter application equipment, chemical storage and disposal sites, shall be inspected by the poultry producer at least monthly for proper maintenance and operation. A complete site inspection shall be conducted by the poultry producer each year including (1) identification of potential pollutant sources that exist onsite, (2) inspection of all controls, practices, and operations outlined in the WQMP to reduce potential for pollutants to be transported off-site, and (3) updating the WQMP to reflect current conditions. Poultry facilities are subject to inspections by staff from TSSWCB or the local Soil and Water

Conservation District for compliance with this guidance document and the WQMP.

## CHANGES TO WQMP

Anytime a significant deviation from planned activities takes place, it is important for producers to seek technical assistance and revise the WQMP to reflect the changes. In a case where a TSSWCB-certified WQMP is being used to meet the technical requirements of the CAFO rules, it is extremely important to revise the WQMP and have it re-certified by the TSSWCB. The poultry producer must have the WQMP revised and receive plan approval from TSSWCB:

- Before any change in the number or configuration of land management units (LMUs, for dry poultry operations referred to as litter application fields);
- Before any increase in maximum number of animals;
- Before any new construction or modification of control facilities (ie: poultry houses, litter storage barn, compost, etc.);
- Before any change which has a significant effect on the potential for the discharge of pollutants to surface water in the state;
- If the WQMP is not effective in achieving the general objectives of preventing pollutants in discharges from the poultry facility;
- If any acreage changes or land use changes have occurred;
- If any conservation practices need to be added to or deleted from the WQMP;
- If an ownership change occurs.





# DISCHARGE NOTIFICATION

Date of discharge: \_\_\_\_\_ Pollutant discharged: \_\_\_\_\_

Description of discharge: \_\_\_\_\_

Description of remedial actions taken: \_\_\_\_\_

Did pollutant reach surface water? \_\_\_\_\_

Was TCEQ notified? \_\_\_\_\_ Date/Time of notification: \_\_\_\_\_

Were samples of surface waters taken? \_\_\_\_\_

Laboratory name: \_\_\_\_\_ Date sent to laboratory: \_\_\_\_\_

Laboratory tracking number: \_\_\_\_\_

Date of discharge: \_\_\_\_\_ Pollutant discharged: \_\_\_\_\_

Description of discharge: \_\_\_\_\_

Description of remedial actions taken: \_\_\_\_\_

Did pollutant reach surface water? \_\_\_\_\_

Was TCEQ notified? \_\_\_\_\_ Date/Time of notification: \_\_\_\_\_

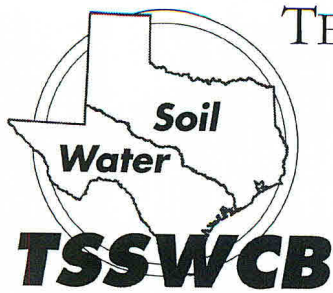
Were samples of surface waters taken? \_\_\_\_\_

Laboratory name: \_\_\_\_\_ Date sent to laboratory: \_\_\_\_\_

Laboratory tracking number: \_\_\_\_\_

*(Place corresponding laboratory analyses for collected discharge samples behind this page)*





# TEXAS STATE SOIL & WATER CONSERVATION BOARD

## WATER QUALITY MANAGEMENT PLANS

FOR

## POULTRY OPERATIONS

### What Are Water Quality Management Plans (WQMPs)?

Water Quality Management Plans (WQMPs) are site-specific conservation plans designed to assist landowners in protecting the environment by remaining in compliance with water quality laws. These plans, in the case of dry-litter poultry operations, include litter management, mortality management, and other soil and water best management practices. These plans are developed by local Soil and Water Conservation Districts (SWCDs), the Texas State Soil and Water Conservation Board (TSSWCB), or a Natural Resources Conservation Service (NRCS) Field Office. Your SWCD and the NRCS approve the WQMP locally, and the TSSWCB certifies that it meets state water quality standards.

### Do I Need To Have A WQMP?

Yes. Since 2001, state law has required poultry operations to obtain a TSSWCB-certified WQMP. All poultry farms must now have a WQMP before birds can be placed on the farm.

### Do I Need To Have A Permit?

**No. The CAFO rules allow dry-litter poultry facilities to operate without a permit if you obtain and follow a Water Quality Management Plan (WQMP) certified by TSSWCB, and do not discharge or propose to discharge pollutants to water in the state of Texas.** If you have 125,000 or more broilers or pullets; or 82,000 breeders or laying hens; or 55,000 turkeys, your operation is still defined as a Confined Animal Feeding Operation (CAFO), and as such, you could be required to obtain permit coverage from the Texas Commission on Environmental Quality (TCEQ). Also, if you confine 37,500 or more broilers or pullets; or 25,000 breeders or laying hens; or 16,500 turkeys in Erath, Bosque, Hamilton, Comanche, Johnson, Hopkins, Wood, or Rains counties you could be required to obtain permit coverage from TCEQ. **Because the larger farms are still defined as CAFOs, you may still be subject to permitting if you do not obtain or follow the WQMP and the Supplemental Guidance for Dry-Litter Poultry Operations. If you do not have a permit and are found to have a discharge to water in the state, you may be subject to enforcement and financial penalties by TCEQ as well as having to obtain a permit to operate. Improper management of animal mortality, applying wastes in improper locations or at improper rates, or failure to obtain appropriate annual soil and litter tests could also result in enforcement and requirement to obtain a permit to operate. To avoid these circumstances, follow closely the guidance in your Water Quality Management Plan (WQMP) and Supplemental Guidance for Dry-Litter Poultry Operations.**

### What Is Considered A Discharge?

Any pollutant from a "point source" that leaves your property or enters water in the state. For example, when rainwater comes in contact with a point source such as a litter storage pile, and runoff water from that pile flows onto your neighbor's property or enters water in the state; that would be a discharge and subject to enforcement. Runoff from litter that is applied to a hay field or pasture or other crop in accordance with the Water Quality Management Plan (WQMP) is non-point source runoff and would **NOT** be considered a discharge. Call or write us if you have questions. Contact information is on the reverse side.

### What Is "Water In The State"?

According to the CAFO rules in 30 Texas Administrative Code §321.32(58), water in the state includes all surface and groundwater within the boundaries of the state of Texas, including ponds, creeks, streams, lakes, etc. on your property.

(MORE ON REVERSE SIDE)

## IMPORTANT INFORMATION

### Mortality Management

Regardless of whether a poultry operation is required to obtain permit coverage, or is only required to obtain and follow a TSSWCB-certified WQMP, there are poultry mortality requirements under state law that must be followed. All poultry operations **MUST** follow the measures that are prescribed in law for routine dead bird disposal. **Burial and dumping of routine mortality is not legal.** Legal measures for routine die-off include placement in a landfill permitted by the TCEQ to receive municipal or industrial solid waste, composting, cremation or incineration, extrusion, on-farm freezing or refrigeration, rendering, or any other method the TCEQ determines to be appropriate. Catastrophic die-off mortality (0.3% or more of total inventory per day), may be buried, but must be buried in accordance with guidance in your certified WQMP.

### Site Assessment of New Poultry Construction or Expansion

Prior to certifying or re-certifying the WQMP, state law requires TSSWCB to assess proposed sites of any new construction or expansion of poultry facilities commenced after September 1, 2009 to determine if the presence of the facility is likely to create a persistent odor nuisance. Contact TSSWCB for more information.

### How Do I Request A WQMP?

Contact your local Soil and Water Conservation District (SWCD) and request planning assistance for a WQMP. The process for obtaining a WQMP starts with the SWCD. The SWCD arranges for technical assistance for the producer to develop a suitable WQMP. After a WQMP is developed through the SWCD, it will be submitted to the TSSWCB to undergo the review and certification process.

### How Do I Contact My Local SWCD?

SWCD boundaries usually match either county or watershed boundaries and are most often co-located with a USDA-Natural Resources Conservation Service (NRCS) field office in the local county. If you are unable to locate your SWCD office, you may contact the nearest TSSWCB office for assistance. Additional contact information as well as a map of all Texas SWCDs can be found at the TSSWCB Website at [www.tsswcb.state.tx.us](http://www.tsswcb.state.tx.us).

**To ask questions or request information, write to us by email at : [poultry@tsswcb.state.tx.us](mailto:poultry@tsswcb.state.tx.us)**

**TSSWCB Headquarters**

4311 North 31<sup>st</sup> Street  
P. O. Box 658  
Temple, Texas 76503  
(254) 773-2250

**TSSWCB - Poultry Office**

2200 NW Stallings Dr., Suite 102  
Nacogdoches, Texas 75964  
(936) 462-7020

**TSSWCB-Dublin Regional Office**

611 East Black Jack  
Dublin, Texas 76446-2321  
(254) 445-4814

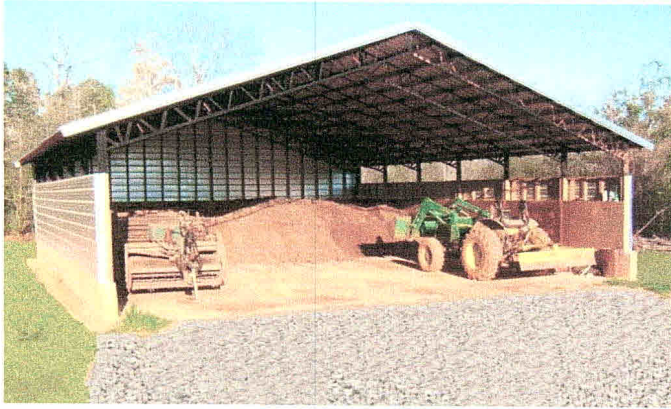
**TSSWCB-Mt. Pleasant Regional Office**

1809 West Ferguson, Suite B  
Mount Pleasant, Texas 75455  
(903) 572-4471

**TSSWCB-Wharton Regional Office**

1120 Hodges Lane  
Wharton, Texas 77488  
(979) 532-9496

# POULTRY LITTER STORAGE



NRCS designed Waste Storage Facility (Litter Barn)

Most poultry farms will periodically have a need to temporarily store litter or “cake” litter. Typically a litter barn is designed to store at least 2 flocks of “cake” litter for when spreader service is not available or land application fields are too wet for spreader equipment.

## REQUIREMENTS FOR LITTER STORAGE

If litter is stored on-farm, it must be protected from contact with rainfall and rain runoff. Use of a litter barn is the preferred method. However, if not kept under a roofed structure, litter must be completely covered with a tarp or similar impermeable material or bermed so that any rain runoff that contacts the litter will not leave the property or enter water of the state. Storage of unroofed litter is limited to 30 days. Storage areas must be at least 150 feet away from private water wells, and at least 100 feet from drainages, creeks, streams, ponds, lakes, wetlands, or other waterways (even if they're dry). Keep litter storage areas as far away from neighbors as possible.

## LITTER STORAGE BARN OPTIONS

The preferred storage structure is a Waste Storage Facility that meets the practice standard design specifications of the USDA Natural Resources Conservation Service (NRCS). However, other structures are acceptable for meeting storage requirements. Abandoned poultry houses, pole barns, or other structures that protect from rainfall and rain runoff are usually acceptable. What's most important is the litter is kept dry and does not make contact with rainfall or other water sources and no polluted runoff discharges from the litter.

## COST-SHARE PROGRAMS

Programs may be available to eligible poultry producers to assist with paying for a newly constructed litter storage facility. However, the facility must meet the specifications set by the agency providing the financial assistance. Check with the TSSWCB or NRCS office nearest you for the requirements and to see if financial assistance is available.

## PROBLEMS THAT MAY RESULT IN VIOLATIONS

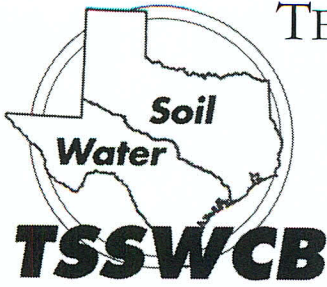
- ◆ Runoff from litter pile entering water of the state or entering a neighbor's property
- ◆ Litter piled too close to a waterway or in a flood zone
- ◆ Excessive litter spilled on drive areas or “turn-out” pads
- ◆ Soil staining by repeated storage of litter in same location
- ◆ Outdoor, uncovered litter not protected from rain runoff
- ◆ Litter piled too close to neighbor's home

## TIPS FOR REDUCING PROBLEMS

- ◆ Keep stored litter under a dry roofed structure
- ◆ Load litter directly from houses onto spreader or truck without staging litter on drives, turn-out pads, or other areas
- ◆ Rotate locations of outdoor storage areas to reduce possibility of soil staining
- ◆ Lightly disc areas where litter has been stored outdoors to incorporate any residual litter
- ◆ Consider in-house “pasteurizing” or “composting” of litter between flocks. This process may reduce bacteria that may be harmful to the birds and cause odors. It also may reduce the frequency of litter clean-outs
- ◆ To help prevent spontaneous combustion, keep the litter dry and do not allow piles to exceed 5 feet in height. If you see the pile smoking, the entire pile should be removed from the structure to prevent fires
- ◆ Contact TSSWCB or NRCS for technical assistance if you elect to construct a berm for litter pile runoff protection
- ◆ Follow guidance in your Water Quality Management Plan (WQMP)



[www.tsswcb.texas.gov/poultry](http://www.tsswcb.texas.gov/poultry)



# TEXAS STATE SOIL & WATER CONSERVATION BOARD

## MORTALITY COMPOSTING REGULATIONS

FOR

## ANIMAL FEEDING OPERATIONS

### Do I Have To Obtain A Permit To Compost Dead Animals From My Farm?

No. According to Title 30 Texas Administrative Code (TAC) §332.3(d)(2), agricultural operations that generate and compost animal carcasses on-site are exempt from Notification, Registration, and Permitting under Chapter 332 of that title. However, all compost operations must follow the General Requirements of 30 TAC §332.4 and 30 TAC §332.8(b). If you follow the composting guidance in your certified Water Quality Management Plan, you will meet those requirements.

### What If I Compost Dead Animals From Another Farm?

The exemption noted above only applies where the composted materials are composted at the same location where they are produced. If you compost dead animals on your farm, but the source of the dead animals is a different farm, even if you own the other farm, you must notify the Texas Commission on Environmental Quality (TCEQ) of that activity, follow the General Requirements of §332.4, and the Operational Requirements of §332.23. You must also comply with the air quality requirements of 30 TAC §332.8(c) or obtain an air quality permit under Chapter 116, Title 30 Texas Administrative Code.

### How Do I Notify TCEQ?

If you compost animals from another farm, you must submit to the Waste Permit Division of TCEQ a Notice of Intent to Operate a Compost Facility form (TCEQ-0651) and a TCEQ Core Data form (TCEQ-10400). Their contact information is as follows:

**Texas Commission on Environmental Quality**  
Waste Permits Division  
MC-124 Municipal Solid Waste Permit Section  
P.O. Box 13087  
Austin, Texas 78711-3087  
Phone: (512) 239-2334

### Where Can I Find More Information About Composting?

You may contact TCEQ as shown above. Also, the rules regulating composting activities can be found on the Texas Secretary of State website at <http://www.sos.state.tx.us/tac/>. More information is available on TCEQ's website at [http://www.tceq.state.tx.us/permitting/waste\\_permits/msw\\_permits/MSW\\_amIregulatedcomposting.html](http://www.tceq.state.tx.us/permitting/waste_permits/msw_permits/MSW_amIregulatedcomposting.html).

To ask questions or request information, write to us by email at:

[poultry@tsswcb.texas.gov](mailto:poultry@tsswcb.texas.gov)

**TSSWCB Headquarters**

4311 South 31<sup>st</sup> Street  
P. O. Box 658  
Temple, Texas 76503  
(254) 773-2250

**TSSWCB - Poultry Office**

2200 NW Stallings Dr., Suite 102  
Nacogdoches, Texas 75964  
(936) 462-7020

**Mt. Pleasant Regional Office**

1809 W. Ferguson, Suite B  
Mt. Pleasant, Texas 75455  
(903) 572-4471

**Dublin Regional Office**

611 East Black Jack  
Dublin, Texas 76446  
(254) 445-4814

**Harlingen Regional Office**

1824 W. Jefferson Ave, Suite A  
Harlingen, Texas 78550  
(956) 421-5841

**Hale Center Regional Office**

1201 Avenue E  
P.O. Box 848  
Hale Center, Texas 79041  
(806) 839-1030

**San Angelo Regional Office**

3129 Executive Dr.  
San Angelo, Texas 76904  
(325) 949-3213

**Wharton R.O.**

1120 Hodges Lane  
Wharton, Texas 77488  
(979) 532-9496



# Handling and Disposal of Carcasses from Poultry Operations

On-farm disposal of dead animals should always be carried out in a manner that protects public health and safety, does not create a nuisance, prevents the spread of disease, and prevents adverse effects on water quality.

If you hatch, raise, or keep poultry, state law (Texas Water Code 26.303, Handling and Disposal of Poultry Carcasses) requires you to properly dispose of any birds that may die while in your care or at your facility. The purpose of this law is to prevent poultry carcasses from creating a nuisance or endangering water quality. The law requires the TCEQ to develop rules that will achieve that purpose—in part, by banning routine on-farm burial of dead poultry. The law does allow on-farm burial, but only in the event of a major die-off.

Texas Water Code 26.303 and TCEQ-related rules (Title 30, Texas Administrative Code, Section 335.25, or 30 TAC 335.25) apply to you if you own or operate a poultry facility, regardless of whether you actually own the poultry. The rules also apply to you even if you are operating a “grandfathered” facility (one exempted because it predates rule enactment) or a facility that is otherwise exempt from TCEQ rules for animal-feeding operations.

Under TCEQ rules, you must use an approved method for handling routine losses and be prepared to handle the results of a *major die-off*, i.e., any incident that causes 0.3 percent or more of your flock to die per day.

## Handling Routine Losses

By planning in advance how you will dispose of carcasses due to routine losses, your facility will be better prepared to deal with environmental and health issues both routinely and in an emergency. If you have a certified water quality management plan (WQMP) from the Texas State Soil and Water Conservation Board (TSSWCB), you should follow the guidance in your plan or contact the TSSWCB. If you do not have a certified WQMP, it is recommended that you contact your local TCEQ office.

The death of less than 0.3 percent of your flock per day is considered a *routine loss*. Routine losses must be managed by one or more of the methods listed below. Whichever method you choose, you must not allow the carcasses to cause a nuisance odor.

- Send the carcasses to a rendering plant,<sup>1</sup> another processing facility, or a permitted landfill.
- Process the carcasses on your farm by a method that is explicitly approved in TCEQ rules.
- Use any other method (except on-site burial), provided that you get TCEQ approval first.

TCEQ rules [30 TAC 335.25(c)] prohibit on-site burial of poultry carcasses due to routine losses.

## How many carcasses should I be able to handle due to routine losses?

To ensure that you can comply with this rule, you should base your routine carcass-handling capacity on the largest number of live birds that your facility is capable of managing. Table 1 gives the number of birds equal to 0.3 percent for various flock sizes commonly managed in Texas.

**Table 1.** 0.3 Percent of Various Sizes of Flocks.

Flock Size	0.3% of Flock Size
16,000	48
64,000	192
128,000	384
192,000	576
256,000	768

## Special requirements for animals that die of communicable diseases

Texas Animal Health Commission (TAHC) rules require disposal of animals that die from a disease recognized as communicable by the veterinary

<sup>1</sup> If the carcasses are to be rendered, the rendering plant must have authorization from the Texas Department of State Health Services (DSHS). Additionally, trucks hauling carcasses to a rendering facility must be registered with the DSHS. See <[www.dshs.state.tx.us/msa/render.shtm](http://www.dshs.state.tx.us/msa/render.shtm)>.

profession within time frames and by methods approved by the TAHC. A list of diseases that are reportable and approved methods of disposal may be obtained from the TAHC. Contact information for the TAHC appears on page 10.

## **But what if the TCEQ has given me permission to bury all carcasses or my permit requires burial?**

Some older permits require that carcasses be buried. However, the statute establishing acceptable methods for carcass handling took effect after those permits were written, and the statute supersedes any related statements in those permits. The TCEQ will change this wording in your permit when you amend or renew it. However, if you have a permit that says you *may* or you *must* bury carcasses, the law requires you to begin to use another method starting *now*.

## **May I leave them for wild animals?**

No. State law specifically prohibits this practice. When carcasses are left in the open, wild animals, rainfall runoff, or both can spread disease from the carcasses to humans and domestic animals, contaminate surface water and groundwater supplies, and cause nuisance odors.

## **What steps must be taken immediately?**

Carcasses must be disposed of by an approved method, or stored in a refrigerated unit within 72 hours, for the owner or operator to remain in compliance with state law and to prevent nuisance odors. When disease is a concern, the TAHC may require immediate action and specify the method for handling and disposal of the carcasses. You must contact the TAHC (see page 10 for contact information) if disease is suspected.

## **Storing for 72 hours or less**

Use a closed trash bin or similar varmint-proof, leakproof, spill-proof, and odor-preventing container. If you use this method, you are not required to register with, or obtain a permit from, the TCEQ.

## ***Long-term storage***

If you plan to hold the carcasses for more than 72 hours before you process them or have them removed, you must store them in a freezer or refrigerator at 40 degrees Fahrenheit or less. If you use this method, you generally will not be required to register with, or obtain a permit from, the TCEQ. However, if you intend to install an ammonia-based refrigeration unit like those used at large commercial refrigeration facilities, you must first verify that the unit will qualify for a permit by rule under TCEQ air-quality rules. If not, you must contact the TCEQ Air Permits Division to get a new permit or amend your current permit before you start building the refrigeration unit.

## **What kinds of processing are acceptable?**

The following methods are approved for the routine disposal of carcasses:

- placement in a landfill permitted by the TCEQ to receive municipal solid waste
- cremation or incineration
- composting
- extrusion
- removal to an offsite rendering plant<sup>2</sup>

The method or methods you choose and the scale of your operation will determine whether you must register, apply for a permit, or notify the TCEQ. The TAHC may require a different method for disposal of diseased animals.

## ***What are the regulatory requirements for carcass incineration?***

Most incinerators used at poultry operations with an incineration capacity equal to or less than 200 lb/hr qualify for a permit by rule under the TCEQ air quality rules (Permit by Rule 106.494). If your incinerator doesn't meet the permit by rules requirements, you will need to obtain an individual air permit from the TCEQ (see page 10 for how to contact the TCEQ Air Permits Division).

Incinerators are typically authorized for use during daylight hours—that is, from one hour after sunrise until one hour before sunset. However, an incinerator with a CO or opacity monitor installed may burn after dark.

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<sup>2</sup> If the carcasses are to be rendered, the rendering plant must have authorization from DSHS. Additionally, trucks hauling carcasses to a rendering facility must be registered with the DSHS. See <[www.dshs.state.tx.us/msa/render.shtm](http://www.dshs.state.tx.us/msa/render.shtm)>.



A list of poultry incinerators that have been registered with the TCEQ is posted on the TCEQ Web site at <[www.tceq.state.tx.us/assets/public/permitting/air/Guidance/NewSourceReview/poultryincin\\_lst2\\_08.pdf](http://www.tceq.state.tx.us/assets/public/permitting/air/Guidance/NewSourceReview/poultryincin_lst2_08.pdf)>

You may also request a copy of the list of registered incinerators by writing or calling the Air Permits Division. Contact information appears on page 10.

### ***How can I compost poultry carcasses?***

TCEQ rules allow you to compost the carcasses of your own poultry on your own farm without registering with the TCEQ or applying for a permit, as long as your operation:

- Composts carcasses from your farm only with suitable bulking agents that have been purchased or have been obtained from your own farm only—for example, poultry litter, pine straw, wood shavings, landscape trimmings, and hay. (This requirement is important to ensure that you don't engage in activities that require additional authorizations.)
- Is kept at least 50 feet from the nearest property line if the total of composting materials and finished compost could exceed 2,000 cu yd.
- Creates no nuisance odors.
- Reduces exposure to “disease vectors”—that is, birds, flies, rodents, and other animals that could spread disease from the carcasses to humans, farm animals, pets, or wildlife.
- Does not discharge contaminants to surface water.
- Does not result in contamination of groundwater.
- Controls dust.

Composting in a covered area or in an enclosed bin can help in achieving these requirements. The USDA Natural Resource Conservation Service (NRCS) can recommend designs for bins that meet these criteria.

It is recommended (but not required) that composting operations be located at least:

- 150 ft from wells
- 150 ft from the nearest creek, stream, pond, lake, or river
- 50 ft from the nearest property line
- outside the 100-year floodplain

It is also recommended that composting operations take place in a location that is not visible to neighbors or traffic.

## What are the requirements for carcass management using other methods?

If you choose another method of disposal, notify the Industrial and Hazardous Waste Permits Section in writing of your choice. Mail your notice to the address on page 10. If you are planning on using one of these methods on a large scale, contact the Air Permits Division (512-239-1240) to find out whether you need to obtain an air quality permit or, if you already have such a permit, amend it.

## Handling Major Die-Offs

In the event of a major die-off (one in which 0.3 percent or more of your flock dies), you may bury the carcasses. However, if the die-off occurs among younger birds, you may find that your normal means of carcass handling will accommodate more carcasses than the number that corresponds to 0.3 percent of your overall inventory.

### Carcass burial

If you choose to bury carcasses resulting from a major die-off on your farm and you have an approved water quality management plan for your site, you do not need to notify the TCEQ. The plan contains a burial map and information on how to bury the carcasses. The TSSWCB, NRCS, or local soil and water conservation district may be able to assist and confirm the appropriate location for burial in the event of a major die-off. (Information about the WQMP Program may be found at the Texas Soil and Water Conservation Web site, <[www.tsswcb.state.tx.us](http://www.tsswcb.state.tx.us)>, or by calling 254-773-2250 or [toll-free] 800-792-3485.)

However, if you do not have a certified water quality management plan, you must notify the TCEQ Industrial and Hazardous Wastes Permits Section in a letter which contains your full name and address, the type of animals, and a short description of the locations on your farm where the carcasses will be buried. This letter will be considered as your compliance with 30 TAC 335.6 and will be acknowledged by the TCEQ. Mail your notification to the address listed on page 10.

It is also recommended that you notify the TCEQ regional office so that its staff can respond to public inquiries and to assist you with issues that may be encountered during an emergency situation.

If you do decide to bury the carcasses, then you remain responsible for controlling these and other potential impacts:

- contamination of groundwater
- contamination of surface water
- nuisance odors
- contact with disease vectors

To control these impacts, you need the right soil, the right site, and the right cover for burial of the carcasses.

### ***Find the right soil***

If you choose to bury the carcasses, you need to do so in soil that will retain the carcasses and their decomposition by-products within the excavation in order to prevent contamination of surface water or groundwater. If you have a certified WQMP, the NRCS can help you determine the suitability of your soils for burial of carcasses.

High-permeability soils such as sand may not be suitable for carcass burial without first lining the burial pit. Holders of certified water quality management plans should contact the TSSWCB or NRCS for assistance in determining the type of liner that may be appropriate for permeable soils. If you do not have a certified WQMP, you may contact the TCEQ Industrial and Hazardous Waste Permits Section (512-239-6595) for guidelines on liner construction.

### ***Find the right site***

The following are guidelines for locating an acceptable site for carcass burial based on the TCEQ rules for the disposal of household garbage, sludge, and wastewater:

- *Protect drinking-water wells.* Under TCEQ rules for wastewater holding tanks and sludge-application sites, the site must be at least 500 ft from the nearest public well, 150 ft from the nearest private well, and located outside of the 100-year floodplain.
- *Protect surface water.* TCEQ rules for septic tanks and drain fields require those facilities to be at least 50 ft from the nearest creek, stream, pond, lake, or river.
- *Protect your neighbors.* The burial site should be at least 50 ft from adjacent property lines; 200 ft or more is recommended.

### ***Use the right cover***

In order to control disease vectors and odors, the TCEQ municipal solid waste rules require that carcasses be covered with at least 2 ft of soil as soon as they

are placed in a landfill. This practice is also recommended for burial of poultry carcasses on individual farms.

### ***You are responsible for protecting our state water resources***

The guidelines for carcass burial are based on other rules developed to protect state water resources. By following them, you should be able to reduce the risk of contaminating water supplies or creating a nuisance. However, you are responsible for any problem that arises from your burial of the carcasses, even if you followed these guidelines when you buried them.

### ***Call before you dig***

We also recommend that you call 800-344-8377 to make sure you will not accidentally hit a gas or utility line on your property during excavation.

### **Do I have options besides burial?**

There is no requirement to bury carcasses resulting from a major die-off.<sup>3</sup> Some alternatives to burial:

- Transport carcasses to a permitted landfill or processing facility.
- Arrange to use an extra waste container temporarily (up to 72 hours) until you can get rid of the carcasses through your normal means.
- Arrange to use a refrigerated unit temporarily until you can get rid of the excess carcasses through your normal means.

Whether these or other alternatives are practical depends on the size of your operation, the size of the die-off, and other factors. Use good judgment when evaluating your choices.

## **What are the Penalties for Violating the Poultry Carcass Handling and Disposal Act?**

You could be fined up to \$10,000 per violation of the act. Each day of noncompliance may be considered a separate violation.

The act appears in the Texas Water Code, Chapter 26, Subchapter H, Poultry Operations.

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<sup>3</sup> If the die-off is as a result of a disease outbreak, the TAHC may specify the disposal method.

# Where Can I Find the Rules on Handling Poultry Carcasses?

All TCEQ rules appear in Title 30, Texas Administrative Code (30 TAC). Rules that directly apply to poultry carcass handling:

## **Industrial Solid Waste (30 TAC 335)**

- Section 335.6, Notification Requirements
- Section 335.25, Handling, Storing, Processing, Transporting, and Disposing of Poultry Carcasses

Other TCEQ rules that are applicable to the handling of poultry carcasses include:

## **Control of Air Pollution by Permitting (30 TAC 116)**

### **Permits by Rule (30 TAC 106)**

- Section 106.494, Incinerators
- Section 106.373, Refrigeration Systems
- Section 106.161, Animal Feeding Operations

## **Concentrated Animal Feeding Operations (30 TAC 321, Subchapter B)**

## **Composting Operations (30 TAC 332)**

## **Municipal Solid Waste (30 TAC 330)**

- Cover Requirements when Burying Dead Animals, Subsection 330.136(b)(2)

All of the rules pertaining to proper handling of poultry carcasses are found on the TCEQ Web site:

<[www.tceq.state.tx.us/goto/rules](http://www.tceq.state.tx.us/goto/rules)>

or order copies from TCEQ Publications:

**e-mail:** <[puborder@tceq.state.tx.us](mailto:puborder@tceq.state.tx.us)>

**fax:** 512-239-4488

**phone:** 512-239-0028

**mail:** Publications Ordering, MC-195  
TCEQ  
PO Box 13087  
Austin, TX 78711-3087

## Who Do I Notify?

If you don't have a certified Water Quality Management Plan, mail your notification or any other correspondence on this topic to:

Industrial and Hazardous Waste Permits Section, MC 130  
PO Box 13087  
TCEQ  
Austin, TX 78711-3087  
**phone:** 512-239-6595  
**fax:** 512-239-6383

For questions about air quality rules only, contact:

Air Permits Division, MC 162  
TCEQ  
PO Box 13087  
Austin, TX 78711-3087  
**phone:** 512-239-1240  
**fax:** 512-239-1300

For questions regarding burial, soils, or other information about a water quality management plan, contact the TSSWCB Poultry Program at:

Poultry Program Office  
TSSWCB  
PO Box 633901  
Nacogdoches, TX 75963  
**phone:** 936-462-7020

In the event of a die-off suspected to have been caused by disease, contact the Texas Animal Health Commission at:

TAHC  
PO Box 12966  
Austin, TX 78711-2966  
**phone:** 800-550-8242

Facilities with a certified water quality management plan may contact the USDA NRCS for assistance in composter design and environmental issues regarding carcass burial at:

USDA NRCS  
101 South Main  
Temple, TX 76501  
**phone:** 254-742-9800  
**fax:** 254-742-9819

## Other Helpful Information and Recommended References

Texas Agriculture Code <[www.statutes.legis.state.tx.us/?link=AG](http://www.statutes.legis.state.tx.us/?link=AG)>, Chapters 161 to 168.

Texas Occupations Code <[www.statutes.legis.state.tx.us/?link=OC](http://www.statutes.legis.state.tx.us/?link=OC)> 801.361, Disposal of Animal Remains.

Texas Animal Health Commission. Call 800-550-8242 before disposing of diseased animals. The TAHC also can supply a list of reportable animal diseases.

*Disposal of Domestic or Exotic Livestock Carcasses* (TCEQ publication no. RG-419) explains suggested guidelines from the TCEQ and the TAHC for disposal of farm or ranch animals.

*Catastrophic Animal Mortality Management (Burial Method)*, Technical Guidance, USDA Natural Resources Conservation Service, Texas State Soil and Water Conservation Board, February 11, 2002.

NRCS TX Conservation Practice Standards, Code 316, Animal Mortality Management.

OSHA Construction rules:

[www.osha.gov/pls/oshaweb/owastand.display\\_standard\\_group?p\\_toc\\_level=1&p\\_part\\_number=1926](http://www.osha.gov/pls/oshaweb/owastand.display_standard_group?p_toc_level=1&p_part_number=1926)

OSHA Excavation Rules:

[www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=STANDARDS&p\\_id=10930](http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10930)

Bryan W. Shaw, Ph.D., P.E., *Chairman*  
Toby Baker, *Commissioner*  
Zak Covar, *Commissioner*  
Richard A. Hyde, P.E., *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY  
*Protecting Texas by Reducing and Preventing Pollution*

May 10, 2015

MR. JOHN EXAMPLE  
OWNER  
EXAMPLE POULTRY FARM  
FM 123  
EXAMPLE, TX 759xx-xxxx

Permit by Rule Registration Number: xxxxxx  
EXAMPLE POULTRY FARM  
National Destructor Poultry Incinerator  
Example, Example County  
Regulated Entity Number: RNxxxxxxxxxx  
Customer Reference Number: CNxxxxxxxxxx

This is in response to your registration Form PI-7 regarding the National Destructor Poultry Incinerator located at FM 123 About x Mi To Cr xxx Then S On Cr xxx About x Mi To Farm On L, Example, Example County.

Example Poultry Farm has registered the operations of the National Destructor Poultry Incinerator under Title 30 Texas Administrative Code (TAC) §§ 106.161 and 106.494. For rule information see: [www.tceq.texas.gov/permitting/air/nav/numerical\\_index.html](http://www.tceq.texas.gov/permitting/air/nav/numerical_index.html)

The company is also reminded that these facilities may be subject to and must comply with other state and federal air quality requirements.

If you need further information or have questions, please contact Mr. \_\_\_\_\_ at (512) 239-1000 or write to the Texas Commission on Environmental Quality (TCEQ), Office of Air, Air Permits Division, MC-163, P.O. Box 13087, Austin, Texas 78711-3087.

This action is taken under the authority delegated by the Executive Director of the TCEQ.

Sincerely,

\_\_\_\_\_, Manager  
Rule Registrations Section  
Air Permits Division

cc: Air Section Manager, Region 10 - Beaumont

Project Number: XXXXXX



# Incinerator Registration

All incinerators on your property must be permitted by Texas Commission on Environmental Quality (TCEQ). Those incinerators that are used to dispose of animal carcasses and meet the conditions of permit-by-rule as defined in Title 30 Texas Administrative Code §106.494, must be registered with TCEQ. **Use of incinerators that are not registered may subject the owner/operator to enforcement action by TCEQ.**

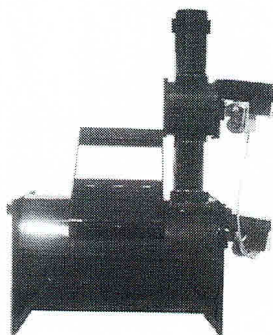
You should get your incinerators registered if the following occurs:

- Existing incinerators are not registered;
- Install a new incinerator;
- Install an additional incinerator;
- Replace an incinerator with a different make or model;

Use TCEQ form PI-7 to register incinerators. A fee is charged by TCEQ for new or additional registrations. However, if an existing incinerator that is already registered is replaced with a new incinerator of the same make and model, and that model currently meets TCEQ's air emissions standards, no action is required. TCEQ has a list of incinerators that meets §106.494 permit by rule standards.

If the incinerator is acquired by someone else, that new owner must register the incinerator in their name. This only requires submitting a name change form to TCEQ if the incinerator is already registered.

When an incinerator is properly registered, TCEQ will send a letter to the owner indicating that the incinerator is registered. You should maintain that letter for your records and provide a copy to Texas State Soil & Water Conservation Board. If you need assistance completing the registration process, contact the TSSWCB office nearest you.



The producer's signature indicates that he/she has received this information.

\_\_\_\_\_  
Producer (Signature)

\_\_\_\_\_  
Date

\_\_\_\_\_  
Producer (Print name)



<http://www.tsswcb.texas.gov/>



## TEXAS STATE SOIL & WATER CONSERVATION BOARD

Nacogdoches Poultry Office

*Protecting and Enhancing Natural Resources for Tomorrow*

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**To:** Poultry Producers

**From:** Mark Cochran, TSSWCB Poultry Program Supervisor

**Date:** July 5, 2012

**Subject:** Use of Landfills as Mortality Management Method

It has been brought to our attention that some poultry producers may wish to dispose of their daily routine poultry mortality by taking them to a landfill and may wish to accumulate and store them on site of the poultry operation prior to taking them to a landfill.

Texas law, under Section 26.303(a)(1)(A) of the Texas Water Code, allows *“placement in a landfill permitted by the Texas Commission on Environmental Quality to receive municipal solid waste”* as an acceptable method for disposal of poultry carcasses.

The Texas State Soil & Water Conservation Board requires that if that method of mortality management is used, the producer must provide receipts from the approved landfill showing:

- 1) the amount of poultry carcasses disposed of and;
- 2) the date the carcasses were delivered to the landfill and;
- 3) the person who delivered the carcasses and;
- 4) the name of the farm that is the source of the carcasses.

Those receipts should be retained for five years from the date the carcasses are disposed of at an approved landfill and made available for inspection upon request.

In addition, Section 26.303(a)(2) *“requires poultry carcasses stored on the site of a poultry facility to be stored in a varmint-proof receptacle to prevent odor, leakage, or spillage”* and;

Section 26.303(a)(3) *“prohibits the storage of poultry carcasses on the site of a poultry facility for more than 72 hours unless the carcasses are refrigerated or frozen”*.

All poultry mortality disposal is regulated under Texas Commission on Environmental Quality (TCEQ) rules at Title 30 Texas Administrative Code §335.25 Handling, Storing, Processing, Transporting, and Disposing of Poultry Carcasses.

Regardless of method selected for disposal, poultry mortality should be managed in accordance with TCEQ Publication RG-326 *Handling and Disposal of Carcasses from Poultry Operations*, which is included in every producer's copy of their Water Quality Management Plan. If a producer does not have this document, he or she should contact TSSWCB for a copy.



## IMPORTANT STATE LAWS AFFECTING TEXAS POULTRY PRODUCERS

### **Senate Bill 1693**, 81<sup>st</sup> Session of the Texas Legislature

Authored by Senator Ogden (Bryan, TX)

Signed on June 19, 2009

Became effective on September 1, 2009

Amended Section 26.302 of the Texas Water Code and Section 382.068 of the Health and Safety Code;  
Added Sections 26.304 and 26.305 to the Texas Water Code

**Requires the Texas Commission on Environmental Quality (TCEQ) to investigate the second odor complaint against a poultry facility within 18 hours. Requires TSSWCB to adopt rules to evaluate siting and construction of a new or expanding poultry facility for its potential to cause persistent odor nuisance. Prohibits TSSWCB from certifying a *Water Quality Management Plan* if persistent odor nuisance is likely, unless TCEQ approves an odor control plan. Requires the owner/operator of a new poultry facility to complete an odor prevention training course from Texas A&M. Requires record keeping of litter use for poultry operators and end users and allows TCEQ to inspect any records required under Subchapter H of Chapter 26, Texas Water Code.**

### **House Bill 1457**, 80<sup>th</sup> Session of the Texas Legislature

Authored by Representative McReynolds (Lufkin, TX)

Signed on June 15, 2007

Became effective on September 1, 2007

Amended Section 26.303 (a) of the Texas Water Code

**Removes cooking of poultry mortality for swine food as a method of poultry carcass disposal to be consistent with Section 165.026 of the Texas Agriculture Code, which prohibits feeding of restricted garbage (*ie: poultry carcasses*) to swine. It also prohibits storage of poultry carcasses on the site of a poultry facility for more than 72 hours unless the carcasses are refrigerated or frozen.**

### **House Bill 1719**, 80<sup>th</sup> Session of the Texas Legislature

Authored by Representative McReynolds (Lufkin, TX)

Signed on June 15, 2007

Became effective on June 15, 2007

Amended Section 201.026 (g) of the Texas Agriculture Code

**Removes the requirement to notify the Texas Commission on Environmental Quality (TCEQ) of burial of animal carcasses if that burial is on land covered by a *Water Quality Management Plan* certified by TSSWCB that addresses site specific animal mortality burial. TCEQ rules only allow poultry carcass burial in the event of a major die-off that exceeds 0.3% per day of the total farm inventory (see 30 Texas Administrative Code §335.25).**

IMPORTANT STATE LAWS AFFECTING  
TEXAS POULTRY PRODUCERS  
(continued)

**Senate Bill 1339**, 77<sup>th</sup> Session of the Texas Legislature  
Authored by Senator Ogden (Bryan, TX)  
Signed on March 8, 2001  
Became effective on September 1, 2001  
Amended Section 26.302 of the Texas Water Code

**Requires all persons who own or operate a poultry facility to implement and maintain a water quality management plan that is certified by the State Soil and Water Conservation Board.**

**House Bill 3355**, 77<sup>th</sup> Session of the Texas Legislature  
Authored by Representative McReynolds (Lufkin, TX)  
Signed on March 9, 2001  
Became effective on September 1, 2001  
Amended Section 201.026 of the Texas Agriculture Code

**Removes the requirement for landowners to record the burial of animal carcasses in county deed records if the landowner requests and complies with a water quality management plan certified by the State Soil and Water Conservation Board.**

**House Bill 3673**, 77<sup>th</sup> Session of the Texas Legislature  
Authored by Representative Swinford (Amarillo, TX)  
Signed on April 10, 2001  
Became effective on September 1, 2001  
Amended Section 165.026 of the Texas Agriculture Code

**Prohibits the feeding of restricted garbage (which includes cooked and uncooked poultry mortality) to swine under any circumstances.**

**Senate Bill 1910**, 75<sup>th</sup> Session of the Texas Legislature  
Authored by Senator Ratliff (Mt. Pleasant, TX)  
Signed on June 19, 1997  
Act became effective on March 1, 1998  
TCEQ rule implementing Act became effective September 5, 1999 (30TAC §335.25)  
Added Subchapter H, *Poultry Operations*, to Chapter 26 of the Texas Water Code

**Defines poultry as chickens or ducks. Allows burial of poultry carcasses only in case of major die-off. Requires poultry owner/operator to have adequate means to dispose of carcasses, litter, and other poultry waste. Requires TCEQ to adopt rules that specify approved methods for poultry carcass disposal.**

**IMPORTANT STATE LAWS AFFECTING  
TEXAS POULTRY PRODUCERS  
(continued)**

**Senate Bill 503**, 73rd Session of the Texas Legislature

Authored by Senator Sims (San Angelo, TX)

Signed on April 29, 1993

Became effective on April 29, 1993

Amended Section 201.026 of the Texas Agriculture Code

**Creates the *Water Quality Management Plan (WQMP) Program*. Establishes TSSWCB as the lead agency in Texas for activity relating to abating agricultural and silvicultural nonpoint source pollution.**

In addition, there are TCEQ regulations relating to poultry operations under Title 30 Texas Administrative Code at:

- §101.4 Air Quality Nuisance;
- §106.494 Pathological Waste Incinerators;
- §111.121 Single-, Dual-, and Multiple-Chamber Incinerators;
- §111.125 Incineration - Testing Requirements;
- §111.127 Incineration – Monitoring and Record Keeping Requirements;
- §111.129 Incineration – Operating Requirements (daytime only operation);
- §321.33(f) Dry-litter Poultry CAFO Facilities
- §321.47 Animal Feeding Operations
- §332.3 (d)(2) Composting – Applicability (exemption for on-farm composting);
- §332.4 Composting – General Requirements;
- §335.5 (d) Deed Recordation for Burial (exemption);
- §335.6 (l) Notification for Burial (exemption);
- §335.25 Industrial Solid Waste – Handling, Storing, Processing, Transporting, and Disposing of Poultry Carcasses.

TSSWCB rules relating to poultry operations are under Title 31 Texas Administrative Code at:

- §523.3 (j) Water Quality Management Plans for Poultry Facilities

If you have questions regarding these or other state laws related to poultry facilities, please contact a State Soil and Water Conservation Board (TSSWCB) office.

**To ask questions or request information, write to us by email at : [poultry@tsswcb.state.tx.us](mailto:poultry@tsswcb.state.tx.us)**

**TSSWCB Headquarters**

4311 South 31<sup>st</sup> Street  
P. O. Box 658  
Temple, Texas 76503  
(254) 773-2250

**TSSWCB - Poultry Office**

2200 NW Stallings Dr., Suite 102  
Nacogdoches, Texas 75964  
(936) 462-7020

**TSSWCB-Dublin Regional Office**

611 East Black Jack  
Dublin, Texas 76446-2321  
(254) 445-4814

**TSSWCB-Mt. Pleasant Regional Office**

1809 West Ferguson, Suite B  
Mount Pleasant, Texas 75455  
(903) 572-4471

**TSSWCB-Wharton Regional Office**

1120 Hodges Lane  
Wharton, Texas 77488  
(979) 532-9496



**TSSWCB**  
POULTRY PROGRAM

**TEXAS STATE SOIL & WATER CONSERVATION BOARD**  
*Protecting and Enhancing Natural Resources for Tomorrow*

**TEXAS SENATE BILL 1693**

**OVERVIEW**

The 81<sup>st</sup> Texas Legislature passed Senate Bill 1693 which went into effect on September 1, 2009. This law amended the Texas Water Code and the Health & Safety Code to address the issue of nuisance odors created by poultry farms and land application of poultry litter. The law has 5 basic requirements as follows:

- ◆ COMPLAINT INVESTIGATIONS
- ◆ ODOR CONTROL PLANS
- ◆ RECORD KEEPING
- ◆ TRAINING FOR ODOR PREVENTION
- ◆ RULES FOR SITING NEW CONSTRUCTION

**COMPLAINT INVESTIGATIONS**

The Texas Commission on Environmental Quality (TCEQ) must investigate within 18 hours:

- a second complaint against a poultry facility concerning odor associated with:
  - the facility OR;
  - land application of poultry litter by the poultry facility;
- a complaint concerning odor from a poultry facility at which the TCEQ has substantiated odor nuisance conditions in the previous 12 months.

If the investigation finds a violation of the facility's air quality authorization or an odor nuisance, the TCEQ must issue a Notice of Violation (NOV).

**RULES FOR SITING NEW CONSTRUCTION**

The law requires the TSSWCB to write rules to establish criteria to determine whether a persistent nuisance odor condition is likely to occur when assessing the siting and construction of new poultry facilities. *The criteria were developed by TSSWCB, TCEQ, Texas AgriLife Extension, and USDA-NRCS. The poultry rules are available on the TSSWCB website or from a TSSWCB office.*

**TRAINING FOR ODOR PREVENTION**

The owner or operator of a new poultry facility shall complete a poultry facility training course on the prevention of poultry facility odor nuisances from the poultry science unit of the Texas AgriLife Extension Service not later than the 90<sup>th</sup> day after birds are first placed on-farm. Extension may charge a fee for the course.

**ODOR CONTROL PLANS**

- If TCEQ issues 3 odor NOV's to a poultry facility within a 12-month period, the facility must enter into a comprehensive compliance agreement with TCEQ, which must include an odor control plan TCEQ determines is sufficient to control odors.
- The TSSWCB may not certify a Water Quality Management Plan for a new poultry facility (or one expanding more than 50%) located less than ½ of one mile from a business, off-site permanently inhabited residence, or a place of worship if the presence of the facility is likely to create a persistent odor nuisance for such neighbors [as determined by the TSSWCB rules], unless the facility provides an odor control plan approved by TCEQ.
- *An example odor control plan has been approved by TCEQ and is available from TSSWCB.*
- *TSSWCB rules allow an option to not obtain an odor control plan if a consent form is provided by all neighbors with ½ of one mile of the facility.*

**RECORD KEEPING**

- Those owners or operators required to take the odor prevention training course must maintain records of the training.
- A poultry facility must maintain for 2 years records of sale or transfer of poultry litter regarding:
  - ◆ identity of the purchaser or applicator;
  - ◆ physical destination of the poultry litter;
  - ◆ date the poultry litter was removed from the poultry facility; and
  - ◆ number of tons of poultry litter removed.
- A person that purchases or obtains poultry litter for land application must maintain for 2 years a signed and dated proof of delivery document for every load of poultry litter land applied and the date(s) it was land applied (*does not apply to litter taken to a composting facility, used as bio-fuel, used in bio-gasification, or otherwise beneficially used without being land applied*).
- All of these records are subject to inspection by TCEQ upon their request.

For information on Water Quality Management Plans, rules pertaining to poultry farms, or to obtain an example Odor Control Plan, contact:



**POULTRY PROGRAM**

**POULTRY PROGRAM OFFICE**

2200 NW Stallings Dr., Suite 102  
Nacogdoches, TX 75964  
(936) 462-7020

**CENTERVILLE POULTRY OFFICE**

1028 E. Frontage Rd.  
Centerville, TX 75833  
(936) 245-9027

**GONZALES POULTRY OFFICE**

920 St. Joseph St., Rm. 132  
Gonzales, TX 78629  
(830) 672-6541

**DUBLIN REGIONAL OFFICE**

611 East Blackjack  
Dublin, TX 76446  
(254) 445-4814

**MOUNT PLEASANT REGIONAL OFFICE**

1809 West Ferguson, Suite B  
Mount Pleasant, TX 75455  
(903) 572-4471

**WHARTON REGIONAL OFFICE**

1120 Hodges Lane  
Wharton, TX 77488  
(979) 532-9496

[www.tsswcb.texas.gov/poultry](http://www.tsswcb.texas.gov/poultry)

For information on Odor Prevention Training Course, contact:



POULTRY SCIENCE DEPARTMENT  
107 Kleberg Center  
2472 TAMU  
College Station, Texas 77843-2472  
(979) 845-4319

Submit Odor Control Plans to:



**TEXAS COMMISSION ON ENVIRONMENTAL QUALITY**  
Air Section Manager at Regional Office for your area:

Region 5  
2916 Teague Dr.  
Tyler, TX 75701  
(903) 535-5100

Region 9  
6801 Sanger Ave., Ste. 2500  
Waco, TX 76710  
(254) 751-0335

Region 10  
3870 Eastex Frwy.  
Beaumont, TX 77703  
(409) 898-3838

Region 14  
NRC Bldg., Ste. 1200  
6300 Ocean Dr., Unit 5839  
Corpus Christi, TX 78412  
(361) 825-3100

See TCEQ Regional Office List and Map for the office that serves your county

Bryan W. Shaw, Ph.D., P.E., *Chairman*  
Toby Baker, *Commissioner*  
Zak Covar, *Commissioner*  
Richard A. Hyde, P.E., *Executive Director*



## TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

April 27, 2015

91 7199 9991 7033 2773

### CERTIFIED MAIL

Mr. John Foster  
Texas State Soil and Water Conservation Board  
PO Box 658  
Temple, Texas 76503-0658

Re: Odor Control Plan,

Dear Mr. Foster:

On April 10, 2015, the Texas Commission on Environmental Quality (TCEQ) Water Quality Division received an Odor Control Plan (OCP) for the poultry farm in County. This letter serves as notice that the OCP has been reviewed and approved by TCEQ.

The OCP is a requirement of the Water Quality Management Plan that is certified by the Texas State Soil and Water Conservation Board (TSSWCB). Observations of non-compliance with the OCP during complaint investigations will be sent to TSSWCB. Any changes to the site plan, facility design or operation will require a new OCP to be submitted to TCEQ for review and approval.

If you have questions or need additional information please contact Mr. Chris Ulmann, of my staff, at (512) 239-0418 or via email at [chris.ulmann@tceq.texas.gov](mailto:chris.ulmann@tceq.texas.gov).

Sincerely,

A handwritten signature in blue ink that reads "David W Galindo".

David W. Galindo, Director  
Water Quality Division

DWG/CSU/tc

RECEIVED  
APR 29 2015



# **Odor Control Plan for**

**John Example  
Example Poultry Farm  
Example County  
June 15, 2015**

This plan is only for dry litter poultry growers who are required by law under §382.068(d) Health & Safety Code or §26.302 (b-3) Water Code to implement an odor control plan. The intent of this plan is to reduce or eliminate nuisance odor sources on the poultry farm and hopefully prevent odor related complaints against the farm.

## **A. Litter Management**

1. Maintain an average litter depth of at least 3 inches
2. Target litter moisture content during the flock should be between 20-30%; not powdery dry, but not so moist it will clump.
3. Management procedures include:
  - a. Maintain proper drinker height.
  - b. Maintain proper drinker water pressure.
  - c. Repair all drinker system leaks upon discovery.
  - d. Repair all evaporative cooling system leaks that will directly deposit water onto litter upon discovery.
  - e. Allow for proper litter drying between flocks. Caked litter must be removed, unless incorporated into in-house windrows for pasteurization of litter. In solid sidewall housing, a minimum amount of ventilation should be used between flocks to remove excessive litter moisture. Target litter moisture content prior to flock placement should be about 20-25% or slightly dryer than during flock grow-out.

## **B. Mortality Management**

1. Mortalities must be collected a minimum of once per day or more frequently as needed to prevent or reduce odors.
2. Upon collection, all mortalities must be immediately placed into an incinerator or freezer, incorporated into a compost pile, or placed into a sealed container to await final disposal. Carcasses must be placed in freezer or other final disposal method the same day as collection. Do not leave mortality carcasses in the open air to await final disposal.
3. Incinerator operations shall be conducted between locally established sunrise and sunset, unless an exception is requested and approved by the controlling regulatory authority. Carcasses in the incinerator that are burning must be completely incinerated prior to nightfall to prevent smoke emissions after dark.

4. Operate and maintain incinerators in accordance with all applicable air regulations and according to the manufacturer's specifications to achieve maximum destruction efficiency. These include but are not limited to: load capacity, burn rate, operating temperature and/or burner operation.
5. Clean ash from incinerators at least weekly or more frequently as needed to maintain efficient incinerator operations.
6. If composting mortality carcasses, all carcass parts must be covered with a minimum of 2 inches of litter, bulking agent material (sawdust, wood chips or shavings, rice hulls), or mature compost the same day as collection. Unroofed compost piles, if used on rare occasions, will to the extent possible be placed out of sight from neighboring residences or public roads and at least 150 feet from the nearest property line. Follow moisture and temperature guidance included in WQMP.
7. Clean all equipment and temporary storage containers used to handle mortalities at least once per week or more frequently as needed to prevent or reduce odors.

### **C. Catch-out/Clean-out Procedures**

1. Keep all doors on poultry houses closed at all times unless equipment access to a particular house is necessary (birds are being loaded/unloaded or litter clean-out/maintenance activities are occurring).
2. Clean up any litter spilled from equipment or dropped from tires during loading outside the houses within 24 hours after completing bird catch-out or litter clean-out.
3. Clean-up any spilled feed inside or outside houses within 24 hours of discovery.

### **D. Litter Storage**

1. The storage of litter on-site is strongly discouraged.
2. If litter must be stored on-site, rainwater shall not be allowed to reach stockpiles. Litter must be stored under a roof (litter shed) or completely covered with a tarp or other impermeable material.

### **E. Land Application**

1. If applying litter to land associated with the poultry houses (on-farm application), the following considerations are to be taken into account:
  - a. Do not apply litter within 100 feet of public roads.
  - b. Do not apply litter within 500 feet of any residence, school, park, place of worship or other facility used by the public.
  - c. Application of litter during morning hours is preferable. Do not apply litter after 5:00 pm.
  - d. Do not apply litter on weekends or federal holidays that occur Monday-Friday if any residence, school, park, place of worship or other facility used by the public is located within 1,500 feet of the nearest edge of the application area.
  - e. Do not apply litter while the wind direction is from any point of application toward a residence, school, park, place of worship or other facility used by the public within 1,500 feet of the nearest edge of the application area.
  - f. Do not apply litter during any rainfall event or if rain is imminent.
  - g. Cover all loads of litter if being transported on public roads.
  - h. Only apply litter at the agronomic rate specified by the Water Quality Management Plan.

## **F. Facility Management**

1. Dust.
  - a. Control vehicle speed to under 15 mph around facility.
  - b. Facility exhaust/ventilation fans should be properly maintained and kept cleaned and free of debris for proper operation.

## **G. Site specific guidelines following a Notice of Violation for nuisance odors could be required to address odor sources identified in the NOV by (but not limited to) the following:**

1. Additional management procedures
  - a. Evaporative cooling system management
  - b. Litter amendment application\*
  - c. Frequency of whole house litter clean-out\*
2. Additional setbacks and land application restrictions
3. Odor mitigation techniques
  - a. Shelterbelts (Vegetative Environmental Buffers)
  - b. Biocurtains or other dust/odor filtration systems\*
  - c. Exhaust air diverters\*
  - d. Other odor control devices\*
4. House density limitations\*
5. Other control actions and management measures as necessary\*

*\* Items with an asterisk are not under the total control of the farm owner and may require integrator consent and cooperation, therefore would require TCEQ to discuss these items with the integrator company prior to requiring them.*

## **H. Attachments**

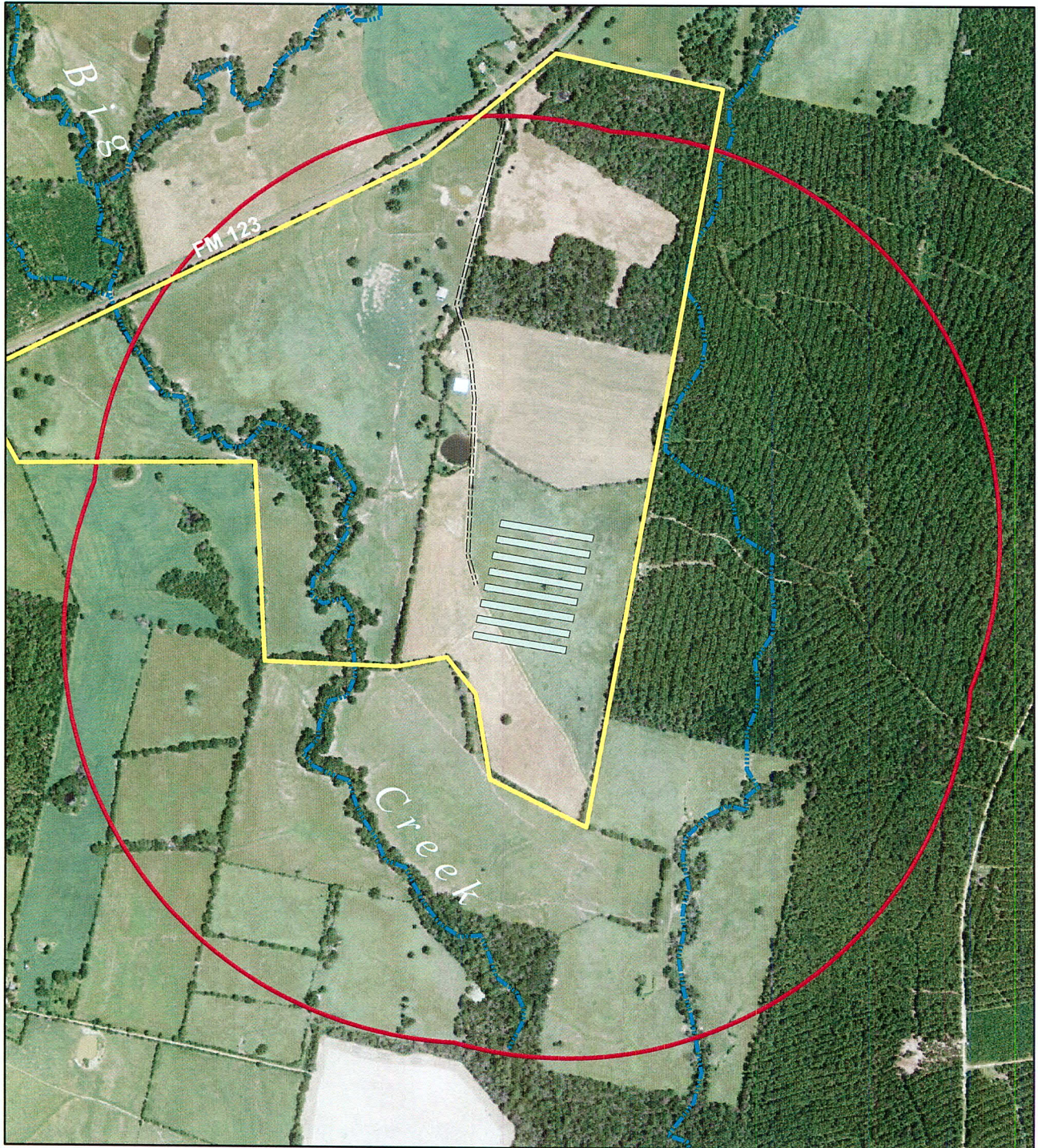
1. Maps
  - a. Vicinity Map (ie: county road map showing location of farm)
  - b. Site Map. Show location of poultry houses, permanent odor sources, and distances and direction to any occupied residence or business structure, school (including associated recreational areas), structure containing a place of worship, or public park within half-mile radius of the permanent odor sources at the facility. The map shall include the north arrow, scale of map, buffer distances, and date that the map was generated and the date that the distances were verified.

Example Poultry Farm  
Approx Acres: 269  
June 15, 2015

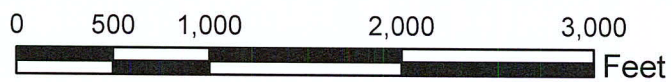
# Odor Control Plan Site Map

Example County

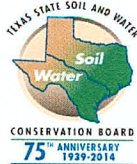
Mark Cochran  
TSSWCB  
Nacogdoches Poultry Office



- Property Boundary for OCP
- 1/2 Mile Circle
- Poultry Houses
- Creek
- Road



One Inch = 1000 Feet



### Poultry Site Assessment Initial Questionnaire

For the initial portion of the site assessment process required under 31 TAC §523.3(j), the following questions must be answered to preliminarily determine if an odor control plan will be required for the proposed facility:

1). Will the facility be a new constructed farm OR increase the existing total farm bird numbers more than 50% of the total documented in the WQMP as of September 1, 2009 or initial date of operation, whichever is later? yes / no

If no, STOP; the site is not required to be evaluated under 31 TAC §523.3(j).  
If yes, proceed with the following:

2). Are there any businesses, off-site permanently inhabited residences, schools, places of worship, healthcare facilities, or other poultry farms within 1/2 of one mile of the proposed facility? yes / no

If no, STOP, no further evaluation required under 31 TAC §523.3(j). Sign below.  
If yes, proceed with the following:

3). Will the facility house less than 10,000 total birds? yes / no

If yes, STOP; the proposed facility is unlikely to cause a persistent nuisance odor, and no further evaluation required under 31 TAC §523.3(j). Sign below.  
If no, proceed with the following:

---

4). Are there any neighbors currently within one quarter of one mile of the facility? yes / no

5). Are there any neighbors between one quarter and one half of one mile in the prevailing wind direction of the facility, considering both cool and warm seasons? yes / no

6). Are there any schools, places of worship, healthcare facilities, or other poultry farms within one half of one mile of the facility? yes / no

7). Will the facility house more than 225,000 total birds? yes / no

8). Will the facility use a liquid waste handling system? yes / no

---

9). Has the facility been issued a Notice of Violation for odor within the last 12 months? yes / no

---

If the answer to any of questions 4-9 above is yes, the facility is likely to cause a persistent nuisance odor and the owner/operator must obtain approval from Texas Commission on Environmental Quality of an odor control plan, or alternatively, provide consent forms for all neighbors within 1/2 of one mile of the proposed facility.

If the answer to all of questions 4-9 above is no, proceed to the Site Assessment Tool for further determination.

I hereby certify that I am an authorized owner or operator of the above described facility and I affirm that the answers to the questions above are true and correct and I understand that falsification of any of the above questions is grounds for removal of certification of my water quality management plan and possible penalties by Texas Commission on Environmental Quality pursuant to Chapter 26 Texas Water Code.

EXAMPLE

\_\_\_\_\_  
Producer Name (printed)

\_\_\_\_\_  
Producer Signature

\_\_\_\_\_  
Date

AFFIRMATION FORM

I hereby affirm that I understand that in accordance with Title 31 Texas Administrative Code §523.3(j)(3) that my proposed poultry animal feeding operation proposed to be built or expanded at the following location:

FM 123  
Example, TX 759xx

has been determined to likely cause a persistent nuisance odor and therefore, in accordance with Texas Water Code §26.302, I must provide an odor control plan approved by Texas Commission on Environmental Quality or;

in accordance with Title 31 Texas Administrative Code §523.3(j)(3)(D), affirm that I have obtained properly signed consent forms from ALL neighbors including permanently inhabited primary residences, businesses, places of worship, schools, healthcare facilities, and other poultry farms that are ½ of one mile or less from the proposed poultry animal feeding operation described above.

I hereby certify that I am an authorized owner or operator of the above described facility and I understand that certification of my water quality management plan, which is required by state law under Texas Water Code §26.302, is contingent upon obtaining approval from Texas Commission on Environmental Quality of an odor control plan or consent from ALL neighbors as described above. I understand that failure to obtain properly signed consent forms from ALL neighbors as described above may cause certification of my water quality management plan to be withdrawn and possible enforcement proceedings by Texas Commission on Environmental Quality pursuant to Chapter 26 Texas Water Code.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

EXAMPLE  
\_\_\_\_\_  
Producer Name and Title (Printed)

FM 123  
\_\_\_\_\_  
Address (Printed)

Example, TX 759xx  
\_\_\_\_\_  
City, State, Zip (Printed)

***Poultry Science Department***

2472 TAMU  
Room 107 Kleberg Bldg.  
College Station, TX 77843-2472  
979/845-4319

**M E M O R A N D U M**

**TO:** Poultry Producers  
Agrilife Extension County Agents

**FROM:** Craig D. Coufal, Assistant Professor and Extension Specialist

**SUBJECT:** S. B. 1693

**DATE:** August 27, 2009

The purpose of this memorandum is to inform poultry producers, custom poultry litter applicators and end-users of poultry litter for the purposes of land application of rule changes recently enacted in S. B. 1693 by the Texas Legislature during the recent session. This rule change requires the poultry facility where the litter originated and the end-user of the litter to **both** maintain records regarding the land application of the litter. These records must be maintained by both parties for 2 years. Specifically, the bill states:

The poultry facility must maintain records regarding:

- 1) the identity of the purchaser or applicator
- 2) the physical destination of the poultry litter identified by the purchaser or transferee
- 3) the date the poultry litter was removed from the poultry facility
- 4) the number of tons of poultry litter removed.

The person that purchases or obtains poultry litter for land application must maintain “a signed and dated proof of delivery document for every load of poultry litter applied to land. The landowner or the owner’s tenant or agent shall note on the document the date or dates on which the poultry litter was applied to land.” This record keeping requirement only applies to litter applied directly to land, and “does not apply to poultry litter that is: 1) taken to a composting facility; 2) used as a bio-fuel; 3) used in a bio-gasification process; or 4) otherwise beneficially used without being applied to land.”

While such record keeping requirements are not a new concept to most poultry producers, non-poultry producing end-users of litter have not previously been required to keep such records. Therefore, it is important that end-users of poultry litter be made aware of this requirement so as to avoid being out of compliance should such records ever be requested by regulatory officials.

Please help me inform those who could be affected by this new law by passing this information on to poultry producers, custom litter applicators and the end-users of poultry litter for land application. This law takes effect September 1, 2009.

If you have any questions regarding this new requirement, please feel free to contact me:

Phone (979)845-4319

Fax (979) 845-1921

email: [ccoufal@poultry.tamu.edu](mailto:ccoufal@poultry.tamu.edu)



## M E M O R A N D U M

**TO:** Poultry producers and others land applying poultry litter

**FROM:** Dr. Craig Coufal, Assistant Professor and Extension Specialist  
Department of Poultry Science, Texas A&M University, College Station, Texas

**SUBJECT:** Best management practices to reduce odors when land applying poultry litter

**DATE:** August 13, 2008

Land application of animal manures at agronomic rates to fertilize crops and pastures is recognized as a responsible method of manure disposal and manure nutrient utilization. Due to the inherent nature of manure and poultry litter, anytime such materials are handled there is a possibility of some odor release. These odors can travel on wind currents and be smelled by neighbors and passersby. Depending on the intensity and duration, some people can find these odors to be highly offensive. Therefore, it is imperative that anyone land applying poultry litter materials be aware of this fact and take every precaution possible to prevent odor nuisance complaints. The following is a list of best management practices (BMPs) that can help reduce odor nuisance problems during land application of poultry litter.

- Try to avoid spreading litter near homes, housing developments, businesses, schools, places of worship, public recreation areas and parks, or heavily traveled roadways.
- Try to avoid spreading litter on weekends, holidays, late in the afternoon or evening, or other times neighbors will likely be engaged in outdoor activities. Early morning is the best time to spread litter, as typical air flow patterns during the warming of the day will help to lift odors high into the air and aid in dissipation.
- Take wind direction and speed into consideration. Try to avoid spreading litter on extremely windy days or if the wind direction may carry dust and odors toward neighbors. In contrast, calm, humid days will cause odors to linger and concentrate and are undesirable. A day with a slight breeze away from neighbors is optimum.

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- Communicate your plans to neighbors prior to beginning litter application. Do not spread litter if they are planning any gatherings or events during or immediately after you are planning to spread litter. Kindly explain your plans to them, and inform them the possibility exists for some odor during and immediately following spreading, but that any odors should dissipate relatively soon and not be a long term problem. Conveying concern and respect for neighbors will go a long way in preventing nuisance complaints.
- Whenever possible, incorporate litter into the soil (usually with a disk). Incorporating the litter below the soil surface will greatly reduce the potential for odor release.
- Do not spread litter during or soon after a rain or if there is a high probability of rain in the immediate future. High moisture conditions favor the formation of odors, especially if the litter has been freshly removed from poultry housing and has not been composted.
- Cover all truck beds and spreaders when transporting litter to reduce odor release and prevent litter from blowing out, especially on public roadways. Also make sure all gates and openings are completely closed to prevent accidental spillage. Clean up all spilled litter immediately.
- If litter must be temporarily stored or stockpiled (less than 30 days), it is advisable to cover the litter with a tarp or plastic sheet to reduce odor release and prevent the addition of moisture (from unexpected rain) which will increase odor generation.
- Watch for dead bird carcasses and body parts when loading and spreading litter. Missed mortalities in the houses can accidentally become incorporated in the litter. Carcasses and body parts are not to be land applied, and should immediately be collected, put into a sealed container or bag, and disposed of by approved method.
- Apply litter at the correct agronomic rate based on soil tests and litter nutrient analysis. Excessive litter application will lead to increased odors and possible water quality problems in runoff. Be sure to calibrate litter spreaders appropriately to assure proper application rates.



# Managing Nuisance Odor and Dust from Poultry Growing Operations

Saqib Mukhtar, John Carey and Ron Lacey\*

**A**s towns and suburbs spread into agricultural areas, new homes, places of worship, schools and businesses may be built near livestock and poultry operations. Almost all agricultural operations generate some odor and dust. This may not be a problem for people who are accustomed to living in an agricultural setting. However, new residents may find the odor and dust to be a nuisance.

With the following practices a producer can reduce odor and dust problems in a poultry growing operation.

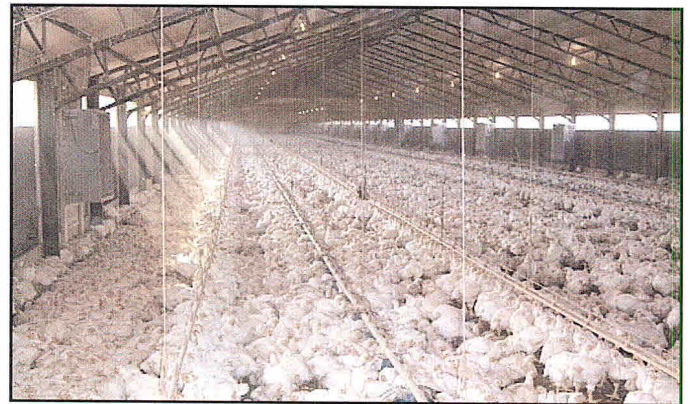
## Constructing the house

If you are building a new poultry house, consider whether neighbors are near enough to be affected by odor and dust. Could future development come close enough to create a problem? How might the local topography, prevailing winds, and vegetation affect the situation?

## Managing the house

Keep litter as dry as possible to slow the microbial action that creates odor. Litter should contain no more than 25 to 35 percent moisture throughout the house.

Operate the ventilation system at or above the minimum recommended rate, and make sure it is functioning properly. Clean fans and fan shutters after each flock; dirty fans and shutters can reduce airflow by more than 30 percent. If the building does not have internal mixing fans, install them to increase air circulation within the building.



Replace water misting cooling systems with evaporative cooling pads on the inlets of tunnel-ventilated houses. If you do use a misting system, adjust it so that excess moisture will not fall on the litter. Ensure that evaporative cooling pads have the correct water flow and that water is not leaking onto the litter. Also prevent leaks in the drinking system. Replace bell drinkers with nipple drinkers to minimize spillage.

## Disposing of dead birds

Collect carcasses frequently, before odors develop. Put them in a covered container and transport them to the disposal facility or composting facility immediately.

## Composting and storing litter

Composting litter and dead birds reduces both odor and the volume of waste generated. If you operate your own litter storage and composting facility, make sure all farm workers who will handle or transport litter are properly trained. While a well-run composting system reduces odor, an improperly run system may actually cause more odor problems.

\*Assistant Professor and Extension Agricultural Engineer, Professor and Extension Poultry Specialist, and Associate Professor and Agricultural Engineer, The Texas A&M University System.

Choose the right design for your facility, so that it will be an integral part of the operation's waste management plan. The USDA-Natural Resources Conservation Service and other agencies have guidelines for the proper design and construction of a poultry composting facility.

Situate the storage and composting facility near a natural windbreak, with attention to the direction of prevailing winds. Or, construct a windbreak if necessary. The less air movement there is around such facilities the less problem there will be with odor and dust moving off-site. Do not build a facility in a wet area or in runoff or drainage pathways.

If litter will be stored temporarily (less than 1 month), keep it covered with a waterproof tarp that is secured on all sides. Covering the litter helps keep it dry. Do not layer wet and dry litter in a stack. Check stacked litter regularly to make sure there are no hot spots (wet spots where microbial activity causes heat to build up) that could combust and start a fire.

Inspecting the compost takes time, and should be done by someone trained to handle problems. If waste is properly composted, its odor is much less noticeable when it is transported and applied to land.

## Applying litter to land

Reducing odor and dust problems from litter applications is a matter of common sense.

Before you schedule an application, talk with neighbors to make sure the application is not made on a day when they have planned outdoor activities. Do not apply litter on weekends or holidays.

Apply litter early in the morning when the typical airflow patterns will lift odors high into the air. Select a day when the wind is blowing away from neighbors. Do not apply litter on hot, still afternoons when there is little air movement and odors

are concentrated. Also avoid extremely dry, windy days when application is likely to generate a lot of dust. However, litter should not be applied during or soon after a rain, or when rain is expected, because moisture increases odor.

Apply the correct amount of litter to fields and pastures, based on a soil test and the nutrient needs of the plants. If too much litter is applied the odor will be stronger and water quality might be harmed. If possible, incorporate litter into the soil soon after spreading it. This reduces odor and the risk to water quality.

To transport litter to the field, load it carefully and cover it with a tarp to prevent spills. Clean up accidental spills immediately.

There should be a large enough storage/composting facility so that litter does not have to be applied to land too often. Having adequate storage allows the producer to wait until conditions are suitable for land application, and this greatly reduces odor and dust problems that might be a nuisance to neighbors.

## Solving problems

Odor problems can be worse during the winter because of ammonia volatilization. Even though the ventilation rate in the poultry house is lower in winter and the volume of air exhausted is much smaller, the concentration of ammonia in the exhaust air may increase. Applying alum reduces the pH of the litter and ammonia volatilization.

It may be necessary to construct windbreaks (hay bales or wood or metal walls) to reduce odor and dust emissions. Windbreaks direct airflow upward and dilute the exhaust air.

Poultry producers must do all they can to reduce excessive odor and dust from their operations and be good neighbors.

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Extension publications can be found on the Web at: <http://texaserc.tamu.edu>

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500, New



Natural Resources Conservation Service  
*Conservation Across America*

# Waste Utilization

Job Sheet - 633



## Waste Utilization Guidelines

- ❖ All manure stockpiled on site should be stored under permanent or temporary cover to be protected from rainfall. Uncovered stacks should not be located in areas where runoff is likely to reach perennial or intermittent streams, lakes, or other sensitive areas.
- ❖ Manure or effluent will not be applied within 150 feet of a private water well, and not within 500 feet of a public water well.
- ❖ Manure or effluent will not be applied within 100 feet of ponds, lakes, perennial or intermittent streams, wetlands, sinkholes, etc. (as designated on NRCS Soil Survey or USGS Topo Map).
- ❖ Manure or effluent will not be applied to frequently flooded areas.
- ❖ Manure or effluent will not be applied to slopes greater than 8 percent, unless application is part of an erosion control plan.
- ❖ A laboratory soil analysis of the application area will be completed before initial manure application and at least every other year if waste is applied annually there after. Manure should be submitted for testing before application. Records of soil and manure tests should be maintained for 5 years.
- ❖ Trucks hauling manure more than one mile down state, federal, or other busy highways should be covered.
- ❖ Manure or effluent should not be applied to frozen, snow covered, or saturated soils, and it should not be applied near sensitive areas (water bodies) if heavy rains are forecast to occur soon after application.
- ❖ Neighbors should be informed prior to manure application. Explain that there may be an odor for several days, and that the odor is not harmful.
- ❖ Manure or effluent should not be applied immediately before weekends or holidays if nearby outdoor activities are planned.
- ❖ Records of where, when, how much, and to what crop manure or effluent is applied should be maintained for 5 years.

Last revised 7/01

## ***CALIBRATING SOLID MANURE SPREADERS***

No fertilizer material can be properly applied if the rate of application is not known. A properly calibrated manure spreader will help ensure the correct amount of manure is applied. The following procedure can be used to calibrate typical solid manure spreaders.

Materials needed:

- Bucket
- Plastic sheet, tarp, or old bed sheet. Even sizes, such as 8 feet x 8 feet, 10 feet x 10 feet, or 10 feet x 12 feet will make the calculation easier.
- Scales (accurate to ½ pound).

<b>Table 1. Calibration of Solid Manure Spreaders</b>			
Pounds of Manure Applied to Sheet	<u>Tons of Manure Applied/Acre</u> Size of sheet (feet)		
	8' x 8'	10' x 10'	10' x 12'
1	0.34	0.22	0.18
2	0.68	0.44	0.36
3	1.02	0.65	0.54
4	1.36	0.87	0.73
5	1.70	1.09	0.91
6	2.04	1.31	1.09
7	2.38	1.52	1.27
8	2.72	1.74	1.45
9	3.06	1.96	1.63
10	3.40	2.18	1.82
11	3.74	2.40	2.00
12	4.08	2.61	2.18
13	4.42	2.83	2.36
14	4.76	3.05	2.54
15	5.10	3.27	2.72
16	5.45	3.48	2.90
17	5.79	3.70	3.09
18	6.13	3.92	3.27
19	6.47	4.14	3.45
20	6.81	4.36	3.63
21	7.15	4.57	3.81
22	7.49	4.79	3.99

If the size of the sheet being used is not listed, the following equation may be used to determine litter application per acre. Remember to account for the moisture content of the material if application rates are to be made on a dry weight basis. This can be done by dividing tons/acre (wet weight basis) by the percent moisture content (decimal fraction).

$$\frac{\text{Pounds of manure collected over sheet} \times 21.78}{\text{Area of sheet, ft}^2} = \text{tons/acre (wet weight basis)}$$

see reverse for additional information

To calibrate:

1. Locate a large reasonably smooth, flat area where manure can be applied.
2. Spread the plastic sheet, tarp, or bed sheet evenly on the surface of the test field.
3. Start driving the spreader at the normal application speed toward the sheet, and begin spreading at an even rate.
4. Drive over the sheet at the normal application speed while continuing to apply manure.
5. Collect all manure spread on the sheet and pour it into the bucket.
6. Weigh the bucket with manure, then subtract the weight of the empty bucket to determine pounds of manure applied to the sheet.
7. Repeat the procedure at least three times to get a reliable average.
8. Determine the average weight of the manure applications.
9. Refer to the chart in Table 1 under the appropriate sheet size to read Tons of Manure Applied Per Acre.
10. Remember to account for moisture content when determining actual land application rates on a dry weight basis.

### ***Optional Method for Easy Calculations***

1. Use a square sheet measuring 4 feet 8 inches on all sides, which is equal to 1/2000<sup>th</sup> of an acre.
2. Follow steps 1 through 8 above.
3. Pounds of manure collected on this size sheet are equal to the Tons of Manure Applied Per Acre.

---

Taken from Texas Agriculture Extension Service Publication No. L-5175 titled *Managing Crop Nutrients Through Soil, Manure and Effluent Testing* by Mark L. McFarland, Tony L. Povin, and Sam E. Feagly.

# PHOSPHORUS



## Too Much and Plants May Suffer

T. L. Provin and J. L. Pitt\*

**T**he buildup of phosphorus in lawns, gardens, pastures and croplands can cause plants to grow poorly and even die. Excessive soil phosphorus reduces the plant's ability to take up required micronutrients, particularly iron and zinc, even when soil tests show there are adequate amounts of those nutrients in the soil.

Phosphorus buildup is caused by excessive use of inorganic fertilizer or the use of composts and manures high in phosphorus. High soil phosphorus levels also can threaten streams, rivers, lakes and oceans.

---

\* Assistant Professor and Extension Soil Chemist/Laboratory Director, Extension Assistant-Laboratory Manager, Soil, Water, and Forage Testing Laboratory; The Texas A&M University System.

Phosphorus can become water-soluble and mobile, entering surface waters and causing algae and other undesirable plants to grow. This reduces water quality and desirable fish and aquatic plants.

### Identifying problems

**S**hallow-rooted annual and perennial plants frequently have iron and zinc deficiencies caused by excessive phosphorus. Also, acid loving plants grown in neutral to alkaline soils display symptoms of deficiencies. Iron deficiencies are characterized by yellowing between the leaf veins. Zinc deficiencies show a bleaching of the tissue. Both iron and zinc deficiencies occur in the youngest tissues and can occur at the same time, which makes it difficult to identify the actual problem.

Lawn grasses, such as St. Augustine, are particularly susceptible to iron and zinc deficiencies because grasses need high levels of iron and have shallow root systems. Many annual bedding plants and newly planted perennial shrubs also can show symptoms. Acid-loving plants like azaleas and blueberries, growing in neutral and slightly alkaline soils, can be killed if excessive amounts of phosphorus are applied.

Most problems related to excessive phosphorus can be avoided by conducting soil tests and using proper fertilization. Manure and composts should be applied judiciously. Annual soil testing to monitor soil phosphorus levels is recommended. Using organic fertilizers with known fertilizer values also can significantly improve the recommended rate of application.



## Correcting problems

To correct problems caused by excessive soil phosphorus, begin by avoiding future phosphorus applications. This includes eliminating organic composts and manures. If organic nitrogen sources or mulches are needed, use very low phosphorus products such as blood meal (as a nitrogen source) or pine bark mulch.

Affected plants need additional iron and zinc. However, simply adding iron and zinc to the soil will not work. Research shows that soil-applied iron is rapidly tied up by alkaline soils and its availability to plants is limited. Under high phosphorus conditions, both iron and zinc are quickly converted to non-available forms. Foliar iron and zinc applications, however, work well. A number of foliar products are available at retail

lawn and garden centers and through the agricultural fertilizer industry.

Apply a 0.5 to 1 percent solution of both iron and zinc to the plant tissue. If a stock nutrient solution contains 10 percent iron and 10 percent zinc, one part stock nutrient solution should be mixed with nine to 19 parts water. The solution should be sprayed on plant leaves just to the point of runoff. Follow-up applications probably will be required, but timing depends on the level of deficiency, the time of year, and iron and zinc requirements of the plants being treated. In general, the solution should be applied every 1 to 4 weeks or at the first signs of deficiency.

Use caution when spraying solutions containing iron. Any over-spray of solution may leave rust stains on sidewalks, bricks, etc. Closely follow the fertilizer label directions to en-

sure proper application rates of iron and zinc.

## Duration of problems

Over time, phosphorus is converted to increasingly stable forms. Phosphorus eventually will be converted into "rock phosphates" that have very limited solubility except in acid soils. How long the problem persists depends on type of plants grown, soil type and the initial level of phosphorus in the soil. Soils with extractable phosphorus levels between 150 to 300 ppm (parts per million) probably will have problems for 3 to 5 years. Soils with phosphorus levels above 330 ppm will require special treatments for much longer.

These timetables, currently under evaluation by the Texas Agricultural Extension Service, are only estimates and will vary considerably.



### For More Information

Soil testing services and additional information can be obtained from the Soil, Water, and Forage Testing Laboratory at ~~345 Heep Center~~, College Station, TX 77843-2474. Contact the lab at ~~(409)~~ 845-4816, Fax ~~(409)~~ 845-5958, or at the Web site <http://soil-testing.tamu.edu>.

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3M, Reprint



## Soil Acidity and Liming

L. A. Redmon, M. L. McFarland, V. A. Haby, and D. H. Bade  
*Department of Soil and Crop Sciences*

### What Causes Soil Acidity?

Various environmental, climatic, and cultural factors can affect formation of acid soils. The most common factors are:

- † **Parent material:** Soils formed from acidic rocks have a lower pH than those formed from basic or alkaline parent material.
- † **Leaching:** Rainfall/irrigation leaches basic elements such as calcium, magnesium and sodium from the soil profile, leaving the acidic elements hydrogen, aluminum and manganese.
- † **Cultural:** Various management practices can affect the formation of acid soils, including:
  - ? Soil erosion can cause the loss of basic elements thus increasing soil acidity.
  - ? Removal of harvested crops depletes basic elements from the soil.
  - ? Nitrogen fertilization can lead to the formation of acid soils when ammonium is converted to nitrate by soil microbes releasing hydrogen ions. Anhydrous ammonia, urea, and ammonium nitrate each produce about one-third as much acidity as ammonium sulfate.

### Soil Acidity Measurement and Ratings

Soil pH is a measure of hydrogen ion activity in the soil solution. However, a buffer-pH test should be used to more accurately predict the limestone needed to raise soil pH to a desired level.

The soil pH scale extends from 0 to 14; thus soil pH in the range of 6.6 to 7.3 is rated neutral. Soils are considered slightly acid between pH 6.5 - 6.1, moderately acid between 6.0 - 5.5, strongly acid between 5.5 - 5.1, very strongly acid between 5.0 - 4.5, and extremely acid below pH 4.4. Soils with pH values above 7.4 are rated as alkaline. Although a decrease in soil pH from 6.0 to 5.0 does not appear significant, there is a 10-fold increase in soil acidity for every whole unit change in soil pH.

### Importance of Liming Acid Soils

The most important benefit of liming acid soils is a reduction of the potentially toxic elements hydrogen, aluminum and manganese. Hydrogen ions only become toxic to plants in extremely acid

soils (pH<4.0) and at very low calcium levels. As pH drops below 5.5, the concentration of soluble aluminum increases and becomes toxic to plant root growth when it exceeds 1.0 part per million (ppm). Below pH 5.2, the concentration of manganese can become toxic.

Optimum nutrient uptake by most crops occurs at a soil pH near 7.0. The availability of fertilizer nutrients such as nitrogen, phosphorus and potassium generally is reduced as soil pH decreases (Table 1). Phosphorus is particularly sensitive to pH and can become a limiting nutrient in strongly acid soils. Thus, reduced fertilizer use efficiency and crop performance occurs when soil acidity is not controlled. Soil pH also affects the types, concentrations and activities of soil microorganisms. As pH drops below 5.5, the population of soil microbes changes and is reduced due to aluminum and manganese toxicity and lower nutrient availability.

Table 1. Plant Nutrient Recovery as Affected by Soil Acidity

Soil pH	Nitrogen	Phosphate	Potash
----- Nutrient Recovery (%) -----			
7.0	70	30	60
6.0	63	15	60
5.5	52	15	45
5.0	38	10	30
4.5	21	8	21

### Limestone Quality

All limestones are not the same and may react more or less efficiently based on the particle size and neutralizing value of the limestone material. Smaller particles have more surface area, react more rapidly to change soil pH, and thus have a higher efficiency rating (ER). Particles larger than 0.080 inches in diameter (about the size of #9 shotgun shot) do not react with the soil to effectively change pH. As particle size decreases, the rate of reaction increases and reaches 100% for particles less than 1/1,000 inch in diameter.

The ability of a limestone to neutralize soil acidity also depends upon its calcium carbonate equivalence (CCE) or neutralizing value, which is expressed as a percentage. Pure calcium carbonate is the standard and has a CCE of 100%. All other liming materials are compared with this standard. Dolomitic limestones contain both calcium and magnesium carbonates. If a soil test indicates low magnesium, dolomitic limestone can be used to correct both the nutrient deficiency and pH.

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## Calculating Application Rates Based on Effective Calcium Carbonate Equivalence

Effective Calcium Carbonate Equivalence (ECCE) combines the fineness efficiency rating (ER) and the calcium carbonate equivalence (CCE) to estimate the percentage of effective limestone in a given product. The percentage ECCE of a product should be available from the vendor. It is important because limestone rates recommended by soil testing laboratories are based on use of 100% effective limestone (dry weight basis).

Agricultural grade limestones generally have an ECCE value of 50-70%. Therefore, if a soil test recommendation for lime is 1.0 ton/acre, the actual application rate of a limestone with an ECCE value of 60% would be 1.67 tons/acre (Table 2). Limestones with an ECCE in the range of 95-100% are becoming increasingly available in the market. In many cases, limestone with an ECCE value of 95-100% that is priced slightly higher per ton is a better buy than standard agriculture grade limestone since a lower application rate is needed (Table 2).

## Timing of Limestone Application

Limestone can be applied at any time, however, several factors should be considered when planning an application. Soil moisture is critical to the reaction of limestone, thus rainfall patterns in the area should be used as a guide. Soils should be sufficiently firm to support heavy equipment and minimize compaction. If subsoil pH is low, a long period will be required for the limestone to effect a change in the soil pH with depth. In addition, coarse limestone reacts more slowly and, as with all limestones, is most effective when incorporated into the soil. When a more rapid and longer lasting pH adjustment is needed, the use of finely ground, high ECCE limestone is advisable.

## Methods of Application

Dry bulk limestone is typically applied using fertilizer spreader trucks. A moisture content of 7 to 9% in fine limestone is needed to minimize dust and achieve a uniform spreading pattern.

Liquid lime is a combination of very fine limestone (100 mesh or smaller) in water with 1 to 2% clay to form a suspension that is about 50 to 60% solids. With proper calibration, this enables uniform product application with no dust. Fluid lime reacts the same as finely ground dry limestone of similar neutralizing value and particle size. At 60% solids including 2% clay, one ton of fluid lime made with calcium carbonate will provide 1,160 lbs. of acid-neutralizing limestone that is as effective as the limestone used to make the suspension. Thus, approximately 1.72 tons of fluid lime (product) would be required to provide the same quantity of acid-neutralizing lime as one ton of dry lime of equivalent quality. Fluid lime is usually more expensive per ton than limestone applied dry due to increased costs for finely ground materials, freight and product application. Although fluid lime reacts fast in the soil because of its extreme fineness, its long-term effectiveness for neutralizing soil acidity is similar to dry liming materials that have an ECCE = 100%.

## Do You Need More Information?

For more comprehensive discussion of soil acidity and liming, see the following publications:

Managing Soil Acidity. McFarland, M.L. et al., 2001. Soil and Crop Sciences Publication No. SCS-2001-05 available at <http://soil-testing.tamu.edu>.

Liming Acid Soils. Haby, V.A. et al., 2001. TAES Bulletin No. B-1720 available at <http://www.overton.tamu.edu>.

## Acknowledgments

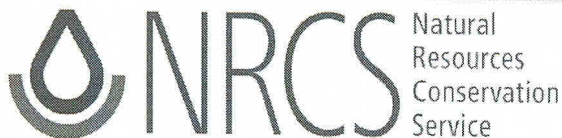
Partial funding for this publication was provided by the Texas-Louisiana Aglime & Fertilizer Association (<http://www.txlime.org>).

Table 2. Use of ECCE to Calculate Limestone Rate and Compare Product Cost

Limestone ECCE (%)	Soil Test Lime Requirement (Tons/Acre)	Application Rate [Lime required/(ECCE/100)]=(Tons/Acre)	Cost Per Ton (\$)	Cost Per Acre (\$)
100	1 ton	1 ton/1.00 = 1.00	35.00	35.00
80	1 ton	1 ton/0.80 = 1.25	32.00	40.00
60*	1 ton	1 ton/0.60 = 1.67	29.00	48.43

\*If one ton of limestone per acre is recommended and the liming material to be used has an ECCE of 60%, then the application rate of this material would be 1 ton divided by 0.60 = **1.67 tons/acre**.

The information given herein is for educational purposes only. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Texas A&M University System or its agencies is implied.



## **LIMING IMPORTANCE IN FERTILITY MANAGEMENT**

The availability of many fertilizer nutrients such as nitrogen, phosphorus, potassium, and others is reduced as soil pH decreases. Thus, in order to maximize the benefits of fertilizer application, lime should be applied to soils when the pH falls from the optimum range of the managed crop. For optimum pH ranges of selected crops see **TABLE 1**.

On cropland, pasture, hayland, and other land where vegetative cover is to be established and maintained, lime recommendations will be based on the results of a current laboratory soil analysis or reliable field test. Recommendations based on field test results will be from **TABLE 2**.

## **LIMING MATERIAL AND APPLICATION**

The quality of liming material is usually expressed as Effective Calcium Carbonate Equivalent (ECCE), which combines the material's fineness efficiency and neutralizing value. Pure calcium carbonate is given a value of 100 or 100%. **Soil test results from Texas A&M University, Stephen F. Austin University, and most other labs provide liming recommendations based on 100% ECCE**, unless otherwise noted on the test results. Ground limestone for agricultural use can have a wide range of ECCE values. Always be aware of the ECCE value of lime that is applied, and apply the amount equivalent to the recommended ECCE. **TABLE 3, RATES OF LIMESTONE MATERIALS WHICH SHOULD BE APPLIED TO FIELDS BASED ON TONS OF ECCE RECOMMENDED AND THE ECCE VALUE OF THE LIMING MATERIAL,** will be used to determine the amount of liming material to apply for various ECCE values.

Liming material applied will be ground to fineness so that at least 40% will pass through a 100-mesh sieve, and that at least 98% will pass through a 20-mesh sieve.

Recommended amounts of liming material will be distributed uniformly at the recommended rate and, if possible, incorporated to a depth of 4 - 6 inches within 24 hours of application on cropland and new field plantings of grasses and legumes. On construction sites recommended amounts of liming material will be incorporated as part of final seedbed preparation. Superfine liming material will be used (if Available) anytime incorporation is not an option.

Where a soil analysis shows a deficiency of magnesium, dolomitic limestone will be used.

Soil pH should be checked at least every 2 - 3 years on cropland and established vegetative cover. The best time to take a soil test is in the fall.

Maintenance of good soil tilth and adequate pH range will make plant nutrient uptake more efficient reducing the amount of applied nutrients needed to achieve yield goals.

USDA NATURAL RESOURCES CONSERVATION SERVICE  
 AGRONOMY TECHNICAL NOTE TX-13 - LIMING INFORMATION AND  
 RECOMMENDATIONS, *Revised July 2005*

TABLE 1  
 RECOMMENDED pH RANGES FOR COMMON CROPS

Field and Forage Crops		Fruits and Vegetables	
<u>Crop</u>	<u>pH Range</u>	<u>Crop</u>	<u>pH Range</u>
Alfalfa	6.5 - 8.0	Apple	6.0 - 8.0
Arrowleaf Clover (Yuchi)	5.5 - 7.0	Beans	6.0 - 7.5
Alyceclover	5.5 - 7.5	Beets	6.0 - 7.5
Bahiagrass	5.5 - 7.0	Blackberries (most vars.)	6.0 - 8.0
Ball Clover	5.5 - 7.5	Blueberries	5.0 - 6.0
Barley	6.5 - 7.8	Cabbage	6.0 - 8.0
Bermudagrass	5.5 - 8.0	Cantaloupe	6.0 - 8.0
Berseem Clover (Bigbee)	6.5 - 8.0	Carrot	6.0 - 7.5
Corn	6.0 - 7.5	Cucumber	5.5 - 8.0
Cotton	6.0 - 8.0	Dewberry	5.5 - 6.5
Cowpeas	5.5 - 7.5	Eggplant	5.5 - 7.5
Crimson Clover	5.5 - 8.0	Grape	6.0 - 8.0
Dallisgrass	6.0 - 7.0	Lettuce	6.0 - 7.5
Lespedeza	5.0 - 6.5	Mustard	5.5 - 6.5
Millet	5.5 - 7.5	Okra	6.0 - 7.5
Oates	5.0 - 7.5	Onion	6.0 - 8.0
Peanuts	5.3 - 6.6	Peach, Plum	6.0 - 7.5
Rice	5.0 - 6.5	Pear	5.8 - 7.5
Rose Clover (Overton R18)	6.0 - 7.5	Peas	6.0 - 8.0
Rye	5.0 - 7.0	Pecan	6.0 - 7.8
Ryegrass	5.5 - 8.0	Pepper	5.5 - 7.0
Singletary Pea	5.5 - 8.0	Irish Potato (For control of scab)	4.8 - 5.4
Sorghum (syrup)	5.5 - 6.5	Irish Potato (For growth and yield)	5.5 - 7.5
Sorghum (forage & grain)	5.5 - 7.0	Sweet Potato	5.0 - 7.5
Soybean	5.5 - 7.5	Radish	6.0 - 8.0
Subterranean Clover (Mt. Barker, Woogenellup) (Clare, Koala, Rosedale)	5.5 - 7.3 6.0 - 8.0	Spinach	6.0 - 8.0
Sudangrass	5.5 - 7.5	Strawberries	5.0 - 7.5
Sweet Clover (Hubam)	6.5 - 8.0	Sweet Corn	6.0 - 7.5
Vetch (Hairy)	5.0 - 8.0	Tomato	6.0 - 7.5
Wheat	5.5 - 7.5	Turnip	5.5 - 7.0
White Clover (La. S-1)	5.5 - 7.5	Watermelon	6.0 - 7.5

**USDA NATURAL RESOURCES CONSERVATION SERVICE  
 AGRONOMY TECHNICAL NOTE TX-13 - LIMING INFORMATION AND  
 RECOMMENDATIONS, Revised July 2005**

**LIMING INFORMATION AND RECOMMENDATIONS**

**TABLE 2 LIMESTONE RECOMMENDATIONS**

**Non-Legumes (tons/acre)\***

<b>pH Range</b>	<b>Soil Texture Class</b>		
	<b>Coarse 1/</b>	<b>Medium 2/</b>	<b>Fine 3/</b>
<b>Greater than 6.0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>5.5 – 6.0</b>	<b>1.0</b>	<b>1.0</b>	<b>1.5</b>
<b>5.0 – 5.4</b>	<b>1.5</b>	<b>2.0</b>	<b>2.5</b>
<b>4.5 – 4.9</b>	<b>2.0</b>	<b>2.5</b>	<b>3.5</b>

**Legumes (tons/acre)\***

<b>pH Range</b>	<b>Soil Texture Class</b>		
	<b>Coarse 1/</b>	<b>Medium 2/</b>	<b>Fine 3/</b>
<b>Greater than 6.5</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>6.0 – 6.4</b>	<b>1</b>	<b>1</b>	<b>1.5</b>
<b>5.5 - 5.9</b>	<b>1</b>	<b>1.5</b>	<b>2</b>
<b>5.0 - 5.4</b>	<b>2</b>	<b>2</b>	<b>3</b>
<b>Lower than 5.0</b>	<b>2.5</b>	<b>3</b>	<b>4</b>

**\* The values above are based on lime with a 100% Effective Calcium Carbonate Equivalent (ECCE).** Thus, rates should be increased when using lower ECCE lime, or decreased when using higher ECCE lime, see Table 3 for details.

Table 2 values are from Texas Cooperative Extension (TCE) publication SCS-2001-05, Managing Soil Acidity.

1/ Coarse includes: coarse sand, sand, very fine sand, loamy coarse sand, loamy sand, loamy fine sand, and loamy very fine sand.

2/ Medium includes: sandy loam, coarse sandy loam, fine sandy loam, loam, very fine sandy loam, silt loam, and silt.

3/ Fine includes: clay loam, sandy clay loam, silty clay loam, sandy clay, silty clay, and clay.

USDA NATURAL RESOURCES CONSERVATION SERVICE  
 AGRONOMY TECHNICAL NOTE TX-13 - LIMING INFORMATION AND RECOMMENDATIONS, Revised July 2005

TABLE 3

RATES OF LIMESTONE MATERIAL WHICH SHOULD BE APPLIED IN THE FIELD BASED ON TONS OF ECCE RECOMMENDED AND THE ECCE VALUE OF THE LIMING MATERIAL <sup>1/</sup>

PERCENT ECCE OF THE LIMING MATERIAL

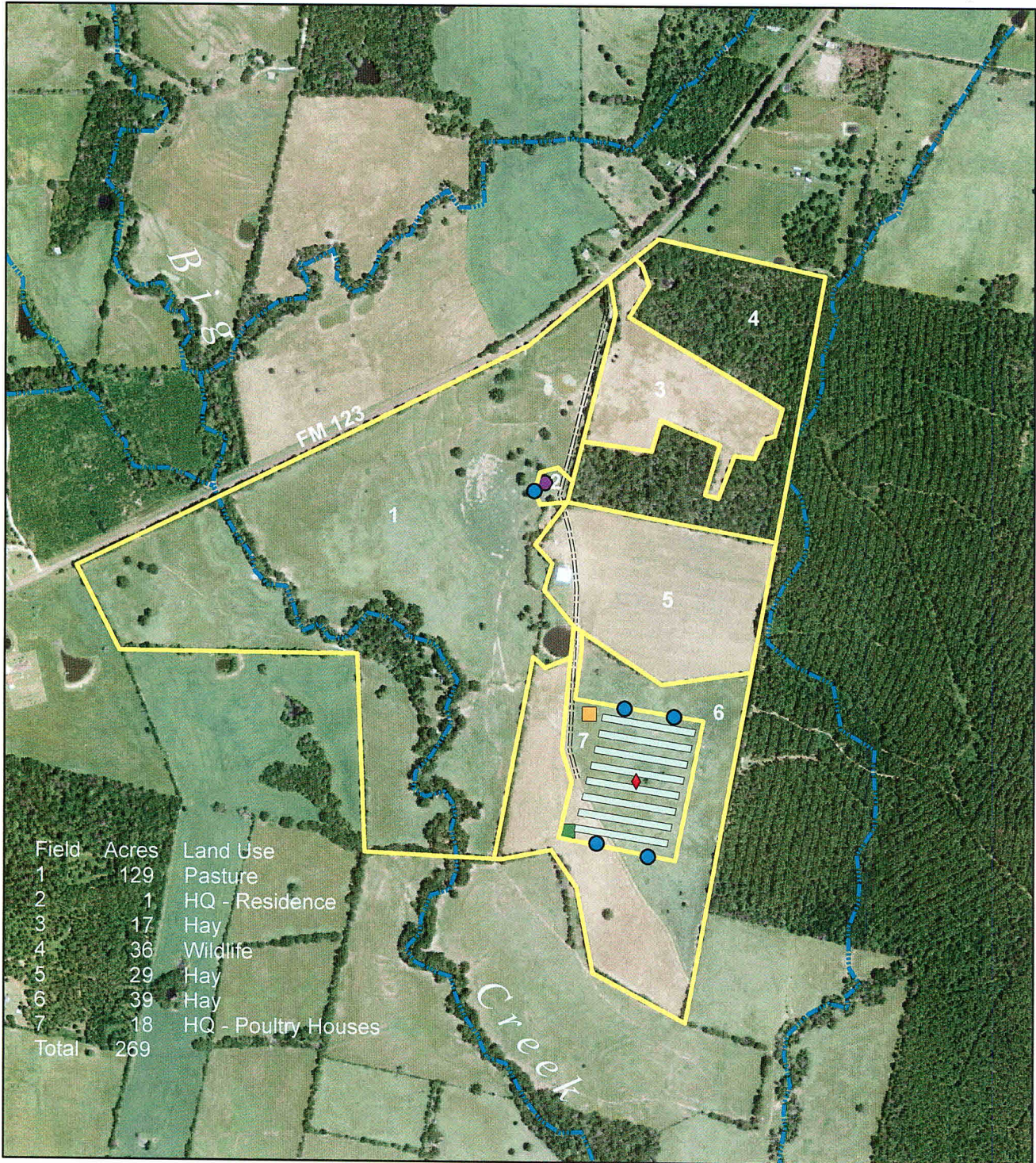
Recommended ECCE rate (tons/acre)	40	45	50	55	60	65	70	75	80	85	90	95	100	105
	TONS OF LIMING MATERIAL PER ACRE													
0.6	1.5	1.3	1.2	1.1	1.0	0.9	0.9	0.8	0.8	0.7	0.7	0.6	0.6	0.6
0.8	2.0	1.8	1.6	1.5	1.3	1.2	1.1	1.1	1.0	0.9	0.9	0.8	0.8	0.8
1.0	2.5	2.2	2.0	1.8	1.7	1.5	1.4	1.3	1.3	1.2	1.1	1.1	1.0	1.0
1.2	3.0	2.7	2.4	2.2	2.0	1.8	1.7	1.6	1.5	1.4	1.3	1.3	1.2	1.1
1.4	3.5	3.1	2.8	2.5	2.3	2.2	2.0	1.9	1.8	1.6	1.6	1.5	1.4	1.3
1.6	4.0	3.6	3.2	2.9	2.7	2.5	2.3	2.1	2.0	1.9	1.8	1.7	1.6	1.5
1.8	4.5	4.0	3.6	3.3	3.0	2.8	2.6	2.4	2.3	2.1	2.0	1.9	1.8	1.7
2.0	5.0	4.4	4.0	3.6	3.3	3.1	2.9	2.7	2.5	2.4	2.2	2.1	2.0	1.9
2.2	5.5	4.9	4.4	4.0	3.7	3.4	3.1	2.9	2.8	2.6	2.4	2.3	2.2	2.1
2.4	6.0	5.3	4.8	4.4	4.0	3.7	3.4	3.2	3.0	2.8	2.7	2.5	2.4	2.3
2.6	6.5	5.8	5.2	4.7	4.3	4.0	3.7	3.5	3.3	3.1	2.9	2.7	2.6	2.5
2.8	7.0	6.2	5.6	5.1	4.7	4.3	4.0	3.7	3.5	3.3	3.1	2.9	2.8	2.7
3.0	7.5	6.7	6.0	5.5	5.0	4.6	4.3	4.0	3.8	3.5	3.3	3.2	3.0	2.9

<sup>1/</sup> EXAMPLE: A soil test recommendation calls for the application of 0.8 tons of ECCE per acre. If the liming material is 50% ECCE, the rate applied in the field is 1.6 tons per acre. However, if the liming material is 90% ECCE, then the rate of material applied in the field is only 0.9 tons per acre.

Source: Table 3 is from the Stephen F. Austin State University Soil Testing laboratory Bulletin SP-4, *Quality of Limestone Sold in Texas: Update 1*, dated January 1989.

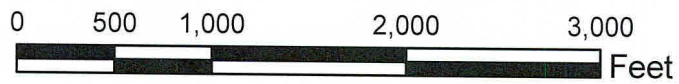
# Conservation Plan Map

Example County



Field	Acres	Land Use
1	129	Pasture
2	1	HQ - Residence
3	17	Hay
4	36	Wildlife
5	29	Hay
6	39	Hay
7	18	HQ - Poultry Houses
Total	269	

- Property Boundary
- Poultry Houses
- Residence
- Litter Barn
- Composter
- Incinerator
- Wells
- Creek
- Road



One Inch = 1000 Feet



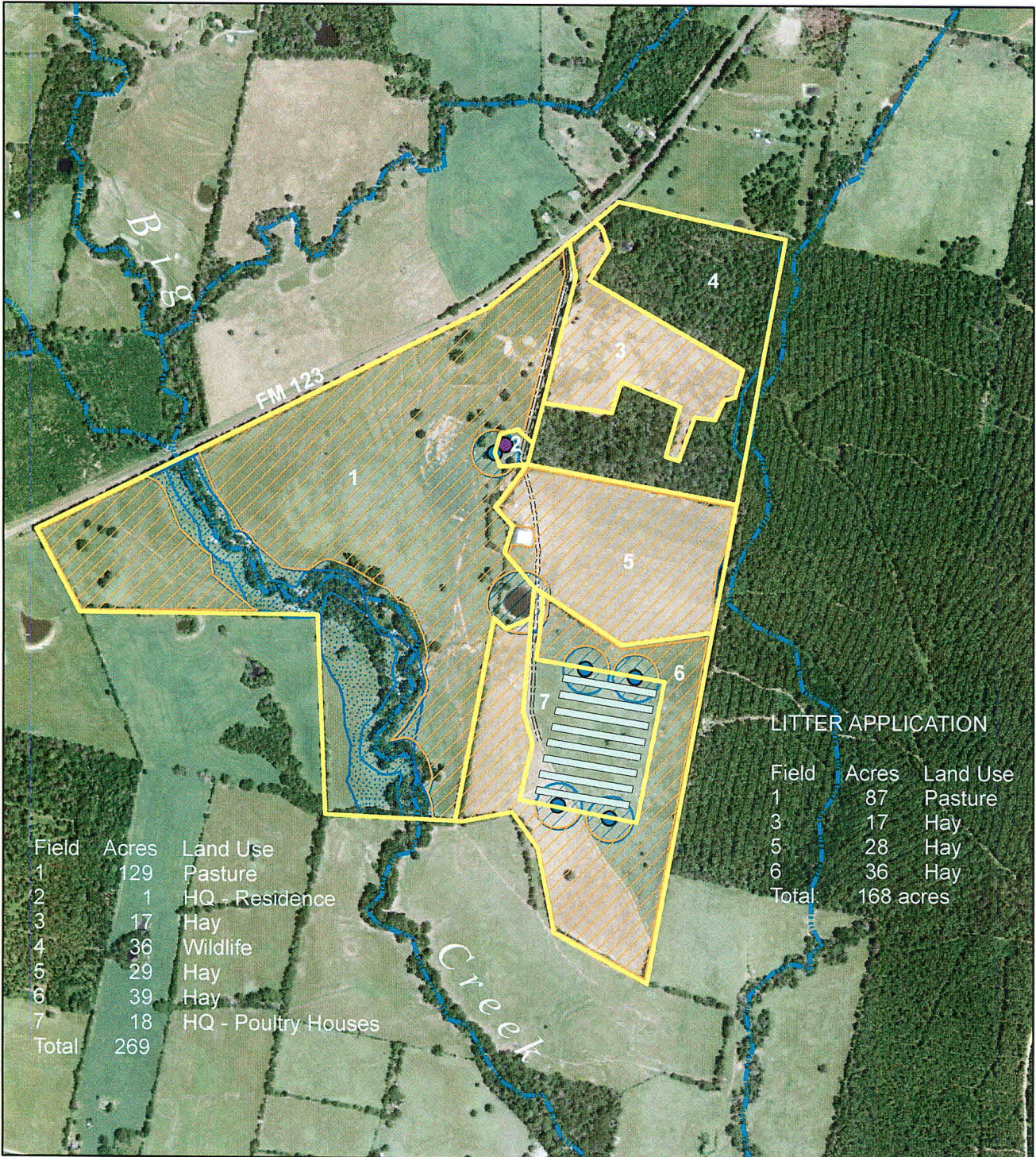


Location Map  
Example Farm  
Example County  
(County Road Map Showing Location of Farm)



# Litter Application Map

Example County

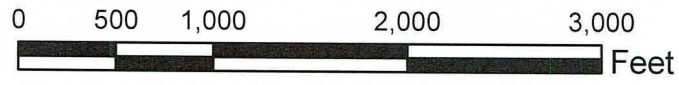


Field	Acres	Land Use
1	129	Pasture
2	1	HQ - Residence
3	17	Hay
4	36	Wildlife
5	29	Hay
6	39	Hay
7	18	HQ - Poultry Houses
<b>Total</b>	<b>269</b>	

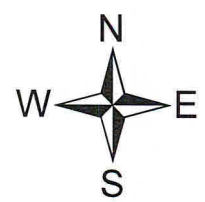
### LITTER APPLICATION

Field	Acres	Land Use
1	87	Pasture
3	17	Hay
5	28	Hay
6	36	Hay
<b>Total</b>	<b>168 acres</b>	

- Property Boundary
- Litter Application
- Poultry Houses
- Residence
- Wells
- Frequently Flooded
- Pond Buffer 100ft
- Creek Buffer 100ft
- Wells Buffer 150 ft
- Creek
- Road



One Inch = 1000 Feet

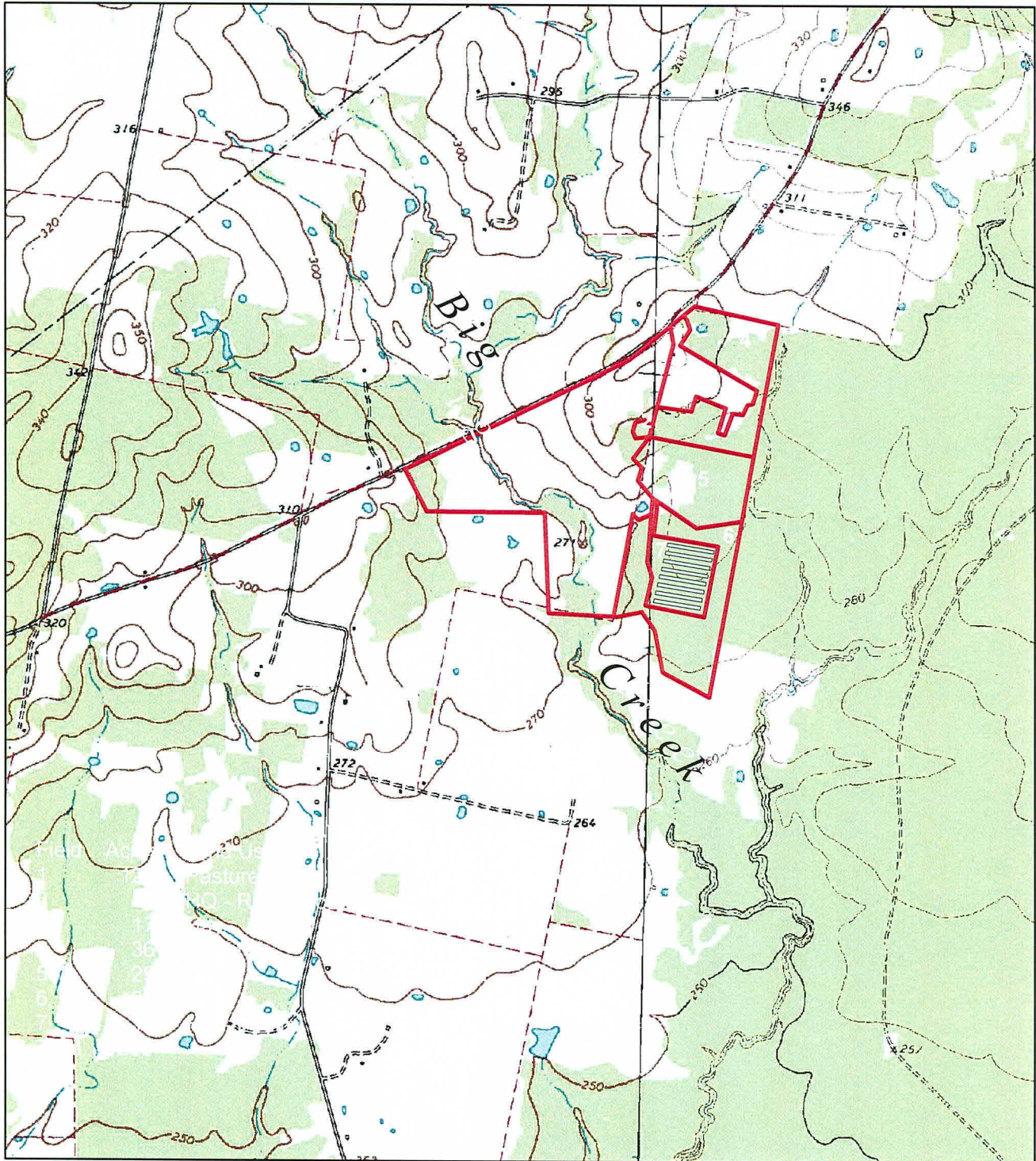


Example Poultry Farm  
Approx Acres: 269  
June 15, 2015

# USGS Topography Map

Example County

Mark Cochran  
TSSWCB  
Nacogdoches Poultry Office



-  Property Boundary
-  Poultry Houses
- Topo\_Text\_Cover



One Inch = 2000 Feet

Latitude: 31° xx' xx" / Longitude: 94° xx' xx"

Example Quadrangle

Contour Interval = 10 Ft



Example Poultry Farm  
Approx Acres: 269  
June 15, 2015

# Soil Map

Example County

Mark Cochran  
TSSWCB  
Nacogdoches Poultry Office



- Property Boundary
- Poultry Houses
- Soil Type Boundaries



One Inch = 1000 Feet



## Map Unit Description (Brief, Generated)

[Minor map unit components are excluded from this report]

**Map unit:** HeB - Herty loam, 1 to 3 percent slopes

**Component:** Herty (90%)

*The Herty component makes up 90 percent of the map unit. Slopes are 1 to 3 percent. This component is on interfluves on coastal plains. The parent material consists of clayey marine deposits. Depth to a root restrictive layer, bedrock, paralithic, is 40 to 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is high. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 9 inches during January, February, March, April. Organic matter content in the surface horizon is about 1 percent. This component is in the F133BY025TX Pinus Echinata-quercus Stellata/callicarpa Americana/chasmanthium Sessiliflorum ecological site. Nonirrigated land capability classification is 3e. This soil does not meet hydric criteria. The soil has a slightly saline horizon within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 11 within 30 inches of the soil surface.*

**Map unit:** Kp - Koury silt loam, 0 to 1 percent slopes, frequently flooded

**Component:** Koury (90%)

*The Koury component makes up 90 percent of the map unit. Slopes are 0 to 1 percent. This component is on flood plains on coastal plains. The parent material consists of loamy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is high. Shrink-swell potential is low. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at 36 inches during January, February, March, April, December. Organic matter content in the surface horizon is about 1 percent. This component is in the F133BY008TX Quercus Nigra-quercus Alba/chasmanthium Latifolium-mitchella Repens ecological site. Nonirrigated land capability classification is 5w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 4 within 30 inches of the soil surface.*

**Map unit:** KuB - Kurth fine sandy loam, 1 to 3 percent slopes

**Component:** Kurth (85%)

*The Kurth component makes up 85 percent of the map unit. Slopes are 1 to 3 percent. This component is on interfluves on coastal plains. The parent material consists of loamy residuum weathered from mudstone over clayey residuum weathered from mudstone. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 34 inches during January, February, March, April, December. Organic matter content in the surface horizon is about 1 percent. This component is in the F133BY027TX Pinus Palustris/schizachyrium Scoparium ecological site. Nonirrigated land capability classification is 2e. Irrigated land capability classification is 2e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.*

## Map Unit Description (Brief, Generated)

**Map unit:** KuD - Kurth fine sandy loam, 5 to 8 percent slopes

**Component:** Kurth (85%)

*The Kurth component makes up 85 percent of the map unit. Slopes are 5 to 8 percent. This component is on interfluves on coastal plains. The parent material consists of loamy marine deposits. Depth to a root restrictive layer, bedrock, paralithic, is 40 to 80 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 36 inches during January, February, March, April, December. Organic matter content in the surface horizon is about 1 percent. This component is in the F133BY027TX Pinus Palustris/schizachyrium Scoparium ecological site. Nonirrigated land capability classification is 4e. This soil does not meet hydric criteria.*

**Map unit:** MsB - Moswell loam, 1 to 5 percent slopes

**Component:** Moswell (85%)

*The Moswell component makes up 85 percent of the map unit. Slopes are 1 to 5 percent. This component is on interfluves on coastal plains. The parent material consists of clayey marine deposits. Depth to a root restrictive layer, densic material, is 40 to 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is high. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the F133BY025TX Pinus Echinata-quercus Stellata/callicarpa Americana/chasmanthium Sessiliflorum ecological site. Nonirrigated land capability classification is 4e. This soil does not meet hydric criteria. The soil has a slightly saline horizon within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 8 within 30 inches of the soil surface.*

**Map unit:** MxA - Moten-Mulvey complex, 0 to 2 percent slopes

**Component:** Moten (55%)

*The Moten component makes up 55 percent of the map unit. Slopes are 0 to 2 percent. This component is on tread stream terraces on coastal plains. The parent material consists of loamy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is high. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 21 inches during January, February, March, April. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 2w. This soil does not meet hydric criteria. The soil has a very slightly saline horizon within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 2 within 30 inches of the soil surface.*

## Map Unit Description (Brief, Generated)

**Map unit:** MxA - Moten-Multey complex, 0 to 2 percent slopes

**Component:** Multey (35%)

*The Multey component makes up 35 percent of the map unit. Slopes are 0 to 2 percent. This component is on tread stream terraces on coastal plains. The parent material consists of loamy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 60 inches during January, February, March, April. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 2s. This soil does not meet hydric criteria.*

**Map unit:** PeB - Penning very fine sandy loam, 0 to 2 percent slopes

**Component:** Penning (90%)

*The Penning component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on drainageways on interfluvies on coastal plains. The parent material consists of loamy alluvium over mudstone residuum. Depth to a root restrictive layer, bedrock, paralithic, is 40 to 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 33 inches during January, February, March, April. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 2w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.*

## Map Unit Description (Brief)

[Only those map units that have entries for the selected description categories are included in this report]

**Map unit:** Kp - Koury silt loam, 0 to 1 percent slopes, frequently flooded

**Description category:** PHG

*2A - LOAMY BOTTOMLAND - Deep and very deep, loamy bottomlands with friable loamy subsoils; may overflow; medium natural fertility; medium to high water holding capacity with good plant-soil-moisture relationship; high production potential.*

**Map unit:** KuD - Kurth fine sandy loam, 5 to 8 percent slopes

**Description category:** PHG

*8C - LOAMY UPLAND - Moderately deep to very deep uplands with loamy surfaces and friable loamy subsoils; slopes 0 to 8 percent; medium natural fertility; medium to high water holding capacity with good plant-soil-moisture relationship; medium to high production potential.*

**Map unit:** MsB - Moswell loam, 1 to 5 percent slopes

**Description category:** PHG

*8A - TIGHT LOAMY UPLAND - Moderately deep to very deep uplands with loamy surfaces and dense subsoils; slopes 0 to 5 percent; low natural fertility; seasonally wet or droughty; medium water holding capacity but poor to fair plant-soil-moisture relationship; medium to high production potential.*

**Map unit:** MxA - Moten-Multey complex, 0 to 2 percent slopes

**Description category:** PHG

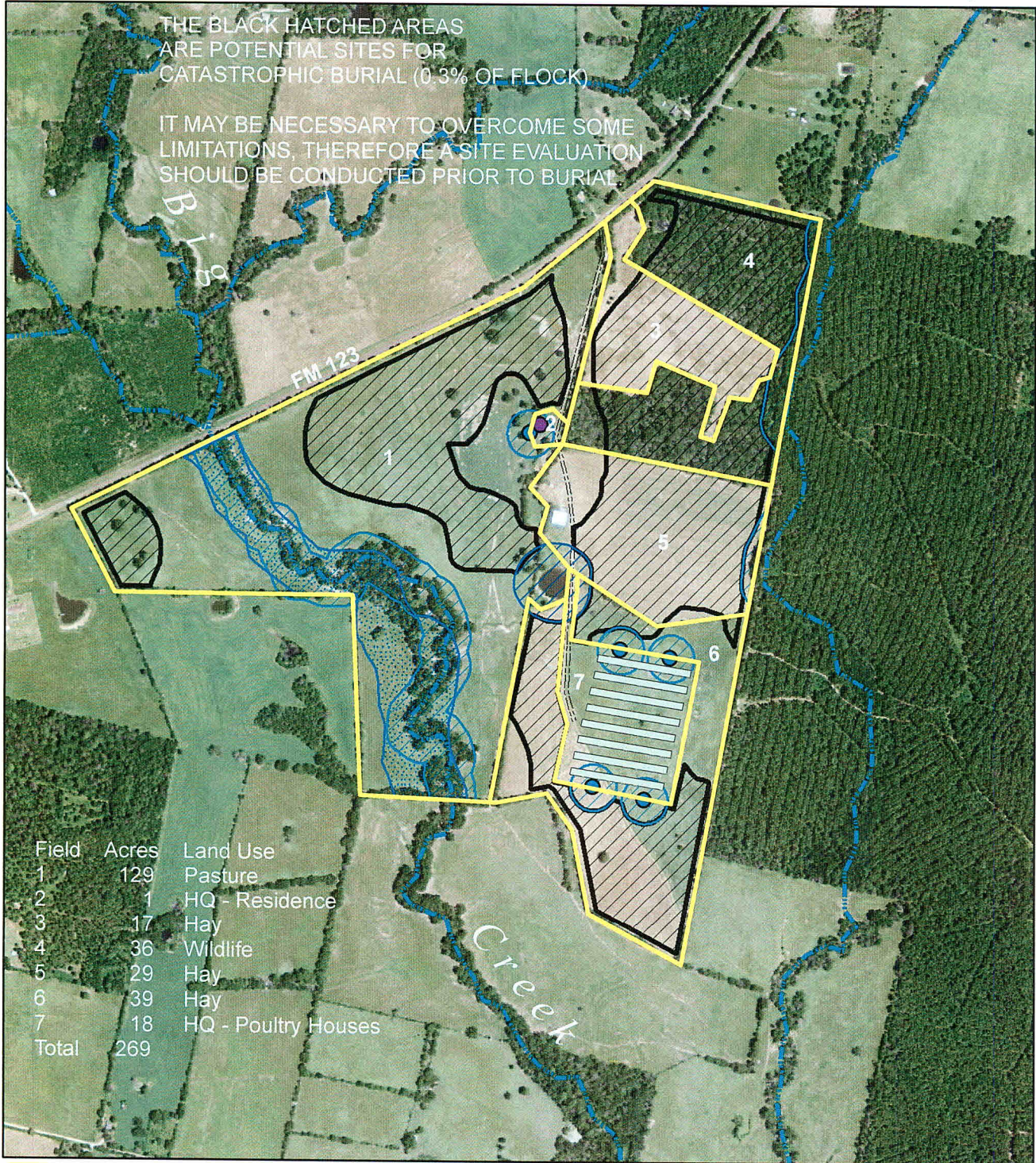
*8E1 - SLIGHTLY WET UPLAND - Deep and very deep, loamy uplands; wet during cool seasons; somewhat poorly drained; mainly tight subsoils; medium natural fertility; Very high to high water holding capacity with fair to good plant-soil-moisture relationship; medium to high production potential.*

*8C - LOAMY UPLAND - Moderately deep to very deep uplands with loamy surfaces and friable loamy subsoils; slopes 0 to 8 percent; medium natural fertility; medium to high water holding capacity with good plant-soil-moisture relationship; medium to high production potential.*



# Catastrophic Mortality Burial Map

Example County



Field	Acres	Land Use
1	129	Pasture
2	1	HQ - Residence
3	17	Hay
4	36	Wildlife
5	29	Hay
6	39	Hay
7	18	HQ - Poultry Houses
Total	269	

- Property Boundary
- Catastrophic Mortality Burial
- Poultry Houses
- Residence
- Wells
- Pond Buffer 150ft
- Frequently Flooded
- Creek Buffer 150ft
- Wells Buffer 150 ft
- Creek
- Road



One Inch = 1000 Feet



## Selected Soil Interpretations

[The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The table shows only the top five limitations for any given soil. The soil may have additional limitations. This report shows only the major soils in each map unit]

\*This soil interpretation was designed as a "limitation" as opposed to a "potential" or "suitability". The numbers in the value column range from 0.01 to 1.00. The larger the value, the greater the potential limitation.

Map symbol and soil name	Pct. of map unit	DHS - Catastrophic Mortality, Large Animal Disposal, Trench*					
		Rating class and limiting features	Value				
HeB:							
Herty	90	Very limited					
		Wetness	1.00				
		Unstable excavation walls	0.51				
		Dusty	0.13				
Kp:							
Koury	90	Very limited					
		Flooding	1.00				
		Wetness	1.00				
		Dusty	0.13				
		Unstable excavation walls	0.01				
KuB:							
Kurth	85	Very limited					
		Wetness	1.00				
		Dusty	0.02				
		Unstable excavation walls	0.01				
KuD:							
Kurth	85	Somewhat limited					
		Wetness	0.90				
		Unstable excavation walls	0.01				
MsB:							
Moswell	85	Somewhat limited					
		Unstable excavation walls	0.51				
		Dusty	0.17				
MxA:							
Moten	55	Very limited					
		Wetness	1.00				
		Water gathering surface	0.40				
		Dusty	0.16				
		Unstable excavation walls	0.01				

## Selected Soil Interpretations

Map symbol and soil name	Pct. of map unit	DHS - Catastrophic Mortality, Large Animal Disposal, Trench*				
		Rating class and limiting features	Value			

MxA:

Multey	35	Very limited				
		Wetness	1.00			
		Seepage	0.21			
		Unstable excavation walls	0.01			
		Dusty	0.01			

PeB:

Penning	90	Somewhat limited				
		Wetness	0.94			
		Water gathering surface	0.27			
		Dusty	0.06			
		Unstable excavation walls	0.01			

# Catastrophic Animal Mortality Management (Burial Method)

## Technical Guidance

USDA/Natural Resources Conservation Service  
Texas State Soil and Water Conservation Board

February 13, 2002

### General Information Relating To All Type Animals

This Guidance applies to all catastrophic animal mortality with the exception of diseased animal carcasses. Texas law has separate requirements for disposal of animal carcasses when death results from one of the diseases listed in Appendix C. Appendix C contains information for disposal of these diseased carcasses.

Each producer should have an established method to handle day-to-day mortality. However, in the event of an unexpected disaster, each producer should have a Catastrophic Animal Mortality Management Plan. The plan should include a detailed action plan and a list of emergency phone numbers of contact persons. {The Texas Natural Resources Conservation Commission (TNRCC), Industrial and Hazardous **Waste Permits Section must be contacted before burial of catastrophic mortality:** }

TNRCC  
Industrial and Hazardous Waste Permits Section, MC-130  
PO Box 13087  
Austin, TX, 78711-3087  
Phone: 512/239-6595, fax: 512/239-6383

*Not Required per §201.026(j) TX Agriculture Code {HB 1719, 80<sup>th</sup> Legis, 2007} if burial is on land covered in WQMP that addresses catastrophic mortality burial.*

Further information concerning regulations pertaining to mortality management can be obtained from TNRCC. Proper disposal of carcasses is important to prevent disease transmission, avoid nuisance problems, and protect air and water quality. TNRCC Rules require disposal of dead animals within 72 hours in a manner which prevents contamination of waters of the state or creation of a nuisance or public health hazard.

Disposal by a rendering company is the preferred method of carcass disposal. Before planning this option contact the rendering facility or its representative to ensure the producer is informed of special handling procedures, equipment needs, scheduling requirements, etc. The producer should maintain a list of contact phone numbers so information will be readily available following a catastrophic die-off. Verify that local companies which have previously picked up and/or rendered dead animals are still doing so. A number of rendering companies across the state have stopped dead animal pick up service, and others have raised their fees significantly. The producer should periodically review the availability and cost of rendering so that the plan can be modified if necessary. This can be an excellent option if mortality can be loaded and transported while still fresh, or the mortality can be refrigerated until loaded and transported.

Disposal in a landfill may be an option in some locations. Before planning this option the closest commercial, regional, county, or municipal landfill should be contacted to determine if the landfill has a permit which would allow acceptance of dead animals (poultry, sheep, cattle, etc.). Also ask if there are any restrictions on type and volume of animal mortality that will be accepted at the facility. Landfill fees and transport, offloading, and handling procedures should be discussed with landfill managers and included in the plan. The use of a landfill is an excellent option if mortality can be loaded and transported while still fresh, or can be refrigerated until transport. The landfill is not a viable option if the producer does not own or have access to a vehicle capable of transporting mortality quickly in an emergency situation. After a

catastrophic die-off is not a good time to find out that a driver and truck to transport mortality will not be available for several weeks (MAKE ARRANGEMENTS NOW, NOT AFTER THE ANIMALS ARE DEAD).

On-farm disposal of catastrophic mortality may be considered if site conditions permit. On-farm methods include burial, composting, and incineration. Incinerators and composters are excellent options for routine mortality but usually do not have the capacity to handle mortality volumes associated with catastrophic events. Composting and incineration should not be relied on for catastrophic mortality handling without a documented evaluation of worst anticipated mortality condition (number, type, and weight of animals), and the anticipated capacity of the system (i.e., lb./hr. incineration rate, hrs/day of operation).

### **Information Specific To Poultry**

For purposes of mortality disposal, Texas Law defines poultry as chickens and ducks (Texas Water Code § 26.301). TNRCC Rules allow storage of carcasses on-site for no more than 72 hours, provided that storage is in a varmint-proof receptacle to prevent odor, leakage, or spillage. Storage beyond 72 hours must be in a freezer or refrigerator at 40 degrees Fahrenheit or lower. Burial of birds is not allowed for day-to-day mortality under Texas law. Rules prohibit on-site burial of poultry carcasses, except in the event of a major die-off, which is defined as a mortality rate of 0.3% of the total poultry inventory or more per day. **Only the die-off that exceeds the capacity of the normal means of mortality management may be buried.**

### **Planning For Burial Of Catastrophic Animal Mortality For All Type Animals (excluding disposal of diseased carcasses)**

The producer, with assistance from NRCS, Texas State Soil and Water Conservation Board personnel, or other qualified professionals should select burial pit sites. During the planning process, the proposed burial site should be evaluated for the following:

- Soil Properties
  - Soil texture
  - Soil permeability
  - Surface fragments (Cobbles or Stones)
  - Slope
  - Depth to high water table (perched) 1/
  - Depth to high water table (apparent) 2/
  - Depth to bedrock
  - Flooding hazard
  - Ponding
- Presence of fractured or cavernous bedrock
- Proximity to water bodies (rivers, streams, ponds, lakes, etc.)
- Proximity to wells
- Distance to public areas
- Distance to residences and property lines

1/ Perched high water table is defined as a zone of saturation above an unsaturated zone at the highest average depth during the wettest season.

2/ Apparent high water table is the level at which water stands in a freshly dug unlined bore hole after adequate time for adjustments in the surrounding soil at the highest average depth during the wettest season (actual ground water level).

Where applicable, local NRCS offices maintain a listing of suitability for Animal Mortality Burial (Catastrophic) by soil map unit. Each soil that is mapped in the county will fall into one of the following categories:

- **Not Limited**—Soils are expected to be suitable for burial. These soils are preferred areas for locating burial pits.
- **Somewhat Limited**—Soils may be used for burial, as long as limitations shown in the FOTG, Section 2, Animal Mortality Burial (Catastrophic) Interpretation are addressed. Soils in this category may have slight to moderate limitations. Care should be taken in evaluating a potential burial site on these soils (See Table 1, below).
- **Very Limited**—Soils are generally not suited for burial pits without overcoming major limitations. These locations are not recommended for burial. Alternative methods of disposal will normally be required if these are the only available soils on the farm.

It should be noted that Soil Interpretations are a preliminary planning tool. They only provide flags for things that need to be considered. Soil Interpretations do not provide criteria for pit design or construction. The chance of an inclusion of a contrasting soil at a particular soil map location varies. For this reason a planned site for burial of catastrophic mortality should never be selected without a site visit to verify assumptions about the location. When a building is full of dead birds is not a good time to discover a high water table at the planned animal burial site.

#### Site Evaluation Criteria

- Watch for perched water tables. A site would not be acceptable without cutoffs and drainage or other special design features if any water table (apparent, perched, seasonal, etc.) is likely to result in water being above the level of the bottom of the pit or flowing down gradient into the pit.
- Soils rated “Not Limited” for Animal Mortality Burial (Catastrophic), FOTG, Section 2, are suitable for burial sites.
- Soils that have a Unified Soil Classification of CH, MH, CL, GC, or SC are suitable for burial sites. Some of these soils will, however, have limitations relating to high clay content (i.e. difficulty in excavation, handling and compacting fill).
- Do not locate the burial pit on soil mapping units that are frequently or occasionally flooded.
- Do not locate the burial pit on soil mapping units that are rarely flooded without constructing measures to protect the site from flood waters.
- Do not locate the burial pit with planned bottom elevation within 2 feet of an apparent water table, highly permeable soils, or fractured bedrock.
- Do not locate the burial pit within 150 feet of private wells, springs, streams, public areas, or within 500 feet of a public well.
- Do not locate the burial pit where surface runoff could enter the pit.
- Do not locate the burial pit within 50 ft of residences or property lines; a distance of 200 ft is recommended if space allows.
- Assess potential impact of and existing hydraulic connections (i.e. tile drains, or drainage ditches)

**Table 1—Required Practices for Burial Pits located in Soils that are “Somewhat Limited”**

Limitation	Method to Overcome Limitation
Slope	Overhead water must be diverted away from the burial area.
Depth to Rock	Bottom of pit must be at least 2 feet above bedrock. If additional depth of pit is needed it must be created by “mounding” of sidewalls above original ground elevation. Cover over the animals must consist of a minimum of one foot of soil on intermediate layers and two feet of compacted soil on top.
Flooding and Ponding	Areas subject to frequent or occasional flooding or ponding are not suited. Rarely flooded or ponded areas are not to be used during periods of high flooding and ponding probability (see soil survey for dates likely to flood). Alternate areas should be planned for use during these periods.
Fragments or Stones	The main problem with these soils is difficulty in mechanical excavation of pit. Implements suited to working in rocky soil should be used. Soils with high percentages of fragments and stones are not suitable.
Perched Water Table	Do not use during wet seasons unless drainage is provided.
Apparent Water Table	Bottom of pit must be at least 2 feet above apparent water table (see soil survey for apparent water table depth). If additional depth of pit is needed it must be created by “mounding” of side walls above original ground elevation. Cover over the animals must consist of a minimum of one foot of soil on intermediate layers and two feet of compacted soil on top.
Seepage	Clay or synthetic liner can be used to prevent or control seepage.
Texture	<p>Sandy—Cut-banks cave: Extra care will be needed during construction to prevent safety problems. Pit top dimensions may have to be enlarged and side slopes flattened (over-sizing the hole) in order to physically construct the pit. Flattened side slopes and vegetation establishment can be used to address potential erosion of burial pit covers.</p> <p>Clayey—Sticky when wet: Select alternate burial sites in case of wet conditions. If no other sites are available, be aware that digging a pit when wet conditions prevail is going to be more difficult, time consuming, and expensive, than if conditions were drier.</p>

### **Procedures for Estimating Burial Pit Volume**

Document design assumptions for the worst case scenario (maximum number of animals to be buried and maximum expected average weight of animals). Determine total weight of mortality for disposal in pounds (lb.). Divide total weight of mortality by 62.4 lb./cu. ft. The result is the approximate volume of mortality to be buried in cu. ft. Additional pit volume will be required to account for voids in placed mortality. In addition, the burial pit should be excavated large enough for both mortality and (where planned) alternate layers of approximately equal thickness of soil (see Appendix A ). The volume of pit excavation required to provide for burial of the mortality would be between 2 and 4 times the mortality volume. A spreadsheet developed for computing volumes of sediment removed from ponds is available on request for aid in determining planned trench dimensions for anticipated volumes of animals and fill.

Evaluate the site to determine areas with suitable soils. Determine practical and safe pit width, depth, and side slopes for the equipment available. Select a cross-sectional geometry for the pit. Determine the pit length with assumed cross sectional area that would be required to provide the total required excavated volume in cu.ft.

An area of suitable soil must be available that is larger than the total planned burial pit surface area before burial is a viable option. Depending on shape of the area containing suitable soils this might require multiple pits. If adequate suitable soils are not available, an alternative or secondary method of catastrophic mortality disposal must be planned.

Actual application would involve a similar analysis. However, when determining pit size, the actual number and weight of animals for burial should be considered rather than worst case. The rest of the procedure would be identical. When a portion of the land area devoted to or planned for catastrophic mortality is utilized, the area should be surveyed (not necessarily a legal survey) and recorded in the producer's plan, or the area should be staked with reference points and survey notes included in the producers plan. This provides the producer with information needed to manage the burial area. With this information it should be possible to avoid a previously utilized area should another catastrophic event occur.

Sample calculations are included in Appendix B.

### **Additional Burial Considerations and Recommendations**

Burial of dead animals (all animal types) requires a backhoe, scraper, bulldozer or other equipment capable of excavation and/or trenching for construction of a burial pit. Burial pits should be dug to an appropriate depth for the specific soil and geologic conditions. Burial pits should be a minimum of 4 ft wide and 3 ft deep with a length adequate to accommodate mortality. Pit bottoms should be relatively level. If excavation depths greater than 6 ft below existing natural ground are anticipated, test pits and/or augured soil samples should be examined to a depth two ft below lowest planned excavation. Site limitations may dictate the use of multiple pits. If more than one pit is required, they should be separated by 3 ft. of undisturbed or compacted soil.

Excavation and trench safety should be taken into account when selecting planned geometry of a burial pit. If there is any chance of the producer or his employees getting into a trench to place or rearrange animals, shovel dirt, or anything else, trench safety must be considered. Trenches or pits 5 ft or deeper are covered by OSHA trench safety criteria and shallower excavations can be dangerous. People constructing or working in or around these burial pits should be aware of trench cave-in hazards (See referenced web sites at the end of this document). Appropriate OSHA safety measures shall be used during excavation and material placement. Excavations greater than 5 feet deep should have a minimum side slopes of 1.5 (horizontal) to 1 (vertical).



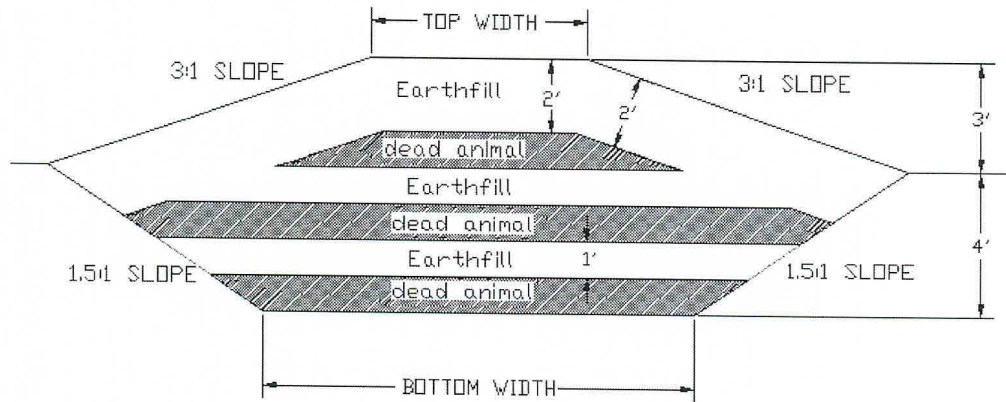
For small animals (poultry, nursery pigs, etc.) place carcasses in a layer no thicker than one foot and cover each layer with at least one foot of soil. Carcasses of large animals (hogs, cattle, etc.) should be placed in one layer and covered with a minimum of two feet of soil. For deep soils (where bedrock is not a concern), carcasses and soil can be placed in multiple layers up to a total depth of eight feet.

The burial site should be mounded with a covering of at least two feet of soil, and surface water should be diverted away from the mound. Specifying earth fill compaction is not recommended. Compaction will be very difficult to achieve and could have a negative impact on the natural decay process. As animals begin to decay, it may be necessary to place additional soil material in areas that subside. If a potential exists for varmints such as coyotes, dogs, opossums, etc., to dig into the burial site, either use more than the two feet of cover material (recommended) or use an appropriate temporary fence to exclude these animal types.

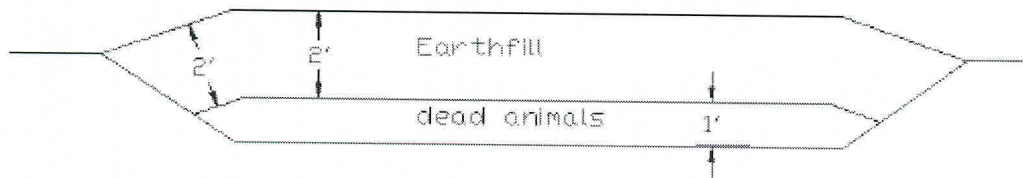
The burial site should be vegetated as soon as practical to prevent erosion of the soil cover.

Personnel planning mortality management must follow current state policy concerning utilities found in the National Engineering Manual, Part 503(Safety), Subpart A (Engineering Activities Affecting Utilities). The State of Texas has initiated a One Call System to help excavators locate pipelines and utilities. The One Call Board of Texas (1-800-545-6005) or other State approved notification center, should be called before excavation to ascertain the existence of underground utilities in the general work area.

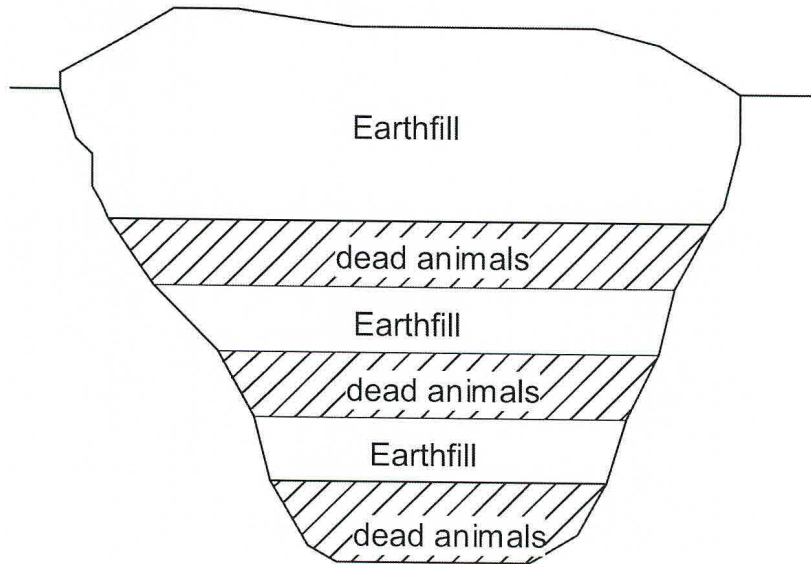
**APPENDIX A**  
**A Few Possible Cross Sections For Burial Pits**



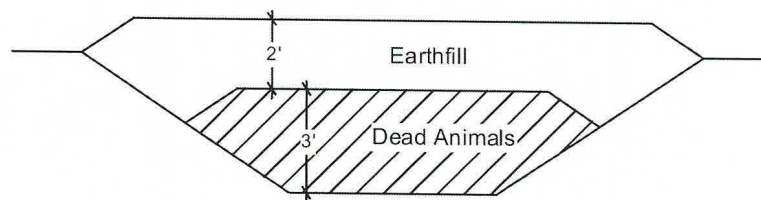
**Typical for greater depth and wider pit with variable length.**



**Typical for shallower depth and wider pit with variable length.**



Typical for backhoe trench with 4-6 ft depth, at least 3 ft width, and variable length.



Typical for deeper depth for larger animals.

## Appendix B

### Sample Calculations

Symbols:		Basic Assumptions:
$W_b$ = bottom width	$A_{xs}$ = cross-sectional area	Bulk density of chickens = 62.4 lb/cu ft
$W_t$ = top width	$Z_s:1$ = side slope	Average weight of chickens at die-off = 3 lb
$L_b$ = bottom length	$Z_e:1$ = end slope	$V_e = 3 \times V_m$
$L_t$ = top length	$V_e$ = excavation volume	Farm contains 5 houses with 20,000
$A_b$ = bottom area	$V_m$ = mortality volume	birds/house or 100,000 birds total
$A_t$ = top area		

#### Case 1: 0.3% of Chickens Die.

Number of mortality = 100,000 x 0.003 = 300 birds

$V_m = 300 \times 3 \text{ lb/bird} \times (1 \text{ cu ft}/62.4 \text{ lb}) = 14.4 \text{ cu ft}$

$V_e = 3 \times 14.4 = 43.2 \text{ cu ft} (1.6 \text{ cu yd})$

Assume

$W_b = 4 \text{ ft}$

$D = 3 \text{ ft}$

Vertical Side and End Slopes (backhoe construction, depth < 3.5 ft):  $Z_s = Z_e = 0$

Then  $L_b = 43.2 / (4 \times 3) = 3.6 \text{ ft. (round to 4 ft)}$

The pit size then would be 4 ft x 4 ft x 3 ft. The Estimated Actual Constructed Volume from the Burial Pit Volume Calculator is 48 ft.<sup>3</sup> (1.8 yd<sup>3</sup>)

#### Case 2: 20% of Chickens Die.

Number of mortality = 100,000 x 0.2 = 20,000 birds

$V_m = 20,000 \times 3 \text{ lb/bird} \times (1 \text{ cu ft}/62.4 \text{ lb}) = 962 \text{ cu ft}$

$V_e = 3 \times 962 = 2886 \text{ ft}^3 (107 \text{ yd}^3)$

Assume

$W_b = 6 \text{ ft}$

$D = 5$

$Z_s = 2$

$Z_e = 4$

$A_{xs} = Z_s D^2 + W_b D = 80 \text{ ft}^2$

Then  $L_b = 2886 / 80 = 36 \text{ ft}$

$W_t = W_b + 2Z_s D = 6 + (2 \times 2 \times 5) = 26 \text{ ft}$

$L_t = L_b + 2Z_e D = 36 + (2 \times 4 \times 5) = 76 \text{ ft}$

$A_t = W_t \times L_t = 26 \times 76 = 1976 \text{ sq. ft.}$

The pit size would be 6 ft. bottom width, 36 ft. bottom length, 26 ft. top width, 76 ft top length, 5 ft. depth, 2:1 side slopes, and 4:1 end slopes. The Estimated Actual Constructed Volume from the Burial Pit Volume Calculator is 4813 ft.<sup>3</sup> (178 yd<sup>3</sup>). If desired, the Burial Pit Volume Calculator can be used through trial and error to find a volume closer to the requirement. (Other dimensions same as given with 12 ft bottom length, and 52 ft top length would yield 2893 ft.<sup>3</sup> (107 yd<sup>3</sup>).

**Case 3: 50% of Chickens Die.**

Number of mortality =  $100,000 \times 0.5 = 50,000$  birds

$V_m = 50,000 \times 3 \text{ lb/bird} \times (1 \text{ cu ft}/62.4 \text{ lb}) = 2404 \text{ cu ft}$

$V_e = 3 \times 2404 = 7212 \text{ cu ft}$  (167 cu yd)

Assume

$W_b = 10 \text{ ft}$

$D = 6 \text{ ft}$

$Z_s = 1.5$

$Z_e = 4$

$A_{xs} = Z_s D^2 + W_b D = 114 \text{ ft}^2$

Then  $L_b = 7212 / 114 = 63 \text{ ft}$

$W_t = W_b + 2Z_s D = 10 + (2 \times 1.5 \times 6) = 28 \text{ ft}$

$L_t = L_b + 2Z_e D = 63 + (2 \times 4 \times 6) = 111 \text{ ft}$

$A_t = W_t \times L_t = 28 \times 111 = 3108 \text{ sq. ft.}$

The pit size would be 10 ft. bottom width, 63 ft. bottom length, 28 ft. top width, 111 ft top length, 6 ft. depth, 1.5:1 side slopes and 4:1 end slopes. The Estimated Actual Constructed Volume from the Burial Pit Volume Calculator is 10350 ft.<sup>3</sup> If desired the Burial Pit Volume Calculator can be used to trial and error to find a volume closer to that required.

(Other dimensions same as given with a 36 ft bottom length, and 84 ft top length would yield a volume of 7272 ft.<sup>3</sup> (269 yd<sup>3</sup>).

## Appendix C

### Statutes, Rules, and References

#### Disposal of Diseased Animal Carcasses

Animals that die from one of the following diseases have separate disposal requirements (Texas Agriculture Code §§161.004, 161.041):

tuberculosis	anthrax	glanders
infectious abortion	hemorrhagic septicemia	hog cholera
Malta fever	foot-and-mouth disease	rabies in animals other than canines
bacillary white diarrhea among fowl	equine infectious anemia	other diseases recognized as communicable by the veterinary profession

These carcasses must be disposed of within 24 hours by

1. digging a five foot deep grave and covering the carcass with lime and filling with dirt, or
2. setting fire to the carcass and burning until it is thoroughly consumed.

#### Specific Rules and Regulations Dealing with Poultry Mortality

Mortality is a normal part of animal feeding operations. Normal poultry mortality should be addressed with composters, incinerators, rendering or other approved carcass disposal methods (§335.25, Handling, Storing, Processing, Transporting, and disposal of Poultry Carcasses, of Title 30, Texas Administrative Code, Chapter 335, Industrial Solid Waste and Municipal Hazardous Waste). The local NRCS or conservation district office should be contacted for assistance in dealing with normal mortality. Note: burial of routine poultry mortality is not allowed by state law (Texas Water Code §26.303 Handling and Disposal of Poultry Carcasses).

State legislators passed SB 1910 during the 75th Texas Legislature (1997) which added “Subchapter H. Poultry Operations” to the Texas Water Code (§26.301 – 26.303). It applies to any facility where chickens or ducks are raised or kept for profit on any premises in the State, including commercial hatcheries for producing chicks or ducklings. TNRCC Rules (Texas Administrative Code (TAC), §335.25 Handling, Storing, Processing, Transporting, and Disposing of Poultry Carcasses) were developed to provide regulations for meeting requirements of SB 1910. These regulations are intended to ensure poultry facilities have an adequate means to handle and dispose of poultry carcasses. These regulations prohibit on-site burial of poultry carcasses, except in the event of a major die-off, which is defined as a mortality rate of 0.3% or more per day of the total poultry inventory. Only the die-off that exceeds the capacity of the normal means of mortality management may be buried.

SB 1339, 77<sup>th</sup> Texas Legislature, 2001, amended §26.302 of the Texas Water Code to require owners or operators of poultry facilities to implement and maintain certified water quality management plans from the State Soil and Water Conservation Board.

#### Additional References

NRCS TX Conservation Practice Standards: Code 316 - Animal Mortality Management

OSHA Construction rules: [http://www.osha-slc.gov/OshStd\\_toc/OSHA\\_Std\\_toc\\_1926.html](http://www.osha-slc.gov/OshStd_toc/OSHA_Std_toc_1926.html)

OSHA Excavation Rules: [http://www.osha-slc.gov/OshStd\\_toc/OSHA\\_Std\\_toc\\_1926\\_SUBPART\\_P.html](http://www.osha-slc.gov/OshStd_toc/OSHA_Std_toc_1926_SUBPART_P.html)

State laws and regulations specific to poultry: Title 30, Texas Administrative Code, Chapter 335, Industrial Solid Waste and Municipal Hazardous Waste, §335.25, Handling, Storing, Processing, Transporting, and disposal of Poultry Carcasses: <http://lamb.sos.state.tx.us/tac/index.html>

Title 2, Texas Water Code, Chapter 26, Subchapter H, Poultry Operations:  
<http://www.capitol.state.tx.us/statutes/statutes.html>

Texas Bills: SB 1339, HB 3355 (77<sup>th</sup> Legislature, 2001): <http://www.lrl.state.tx.us/isaf/lrlhome.cfm>



Know what's below.  
Call before you dig...

[ABOUT TEXAS811](#)

[MEMBER INFORMATION](#)

[DAMAGE PREVENTION](#)

[CALENDAR OF EVENTS](#)

[ADDITIONAL INFORMATION](#)

[CONTACT](#)

## Safe Excavation Begins With You!

It's **FREE**. It's **EASY**. It's the **LAW!**

These simple steps may be the most important you ever take:

**1. Contact us by calling 811 or using GeoRemote or eLOCATE at least 2 working days before you dig.**

Tell us about your project including location and what is being done, as well as all necessary instructions to make sure the right area gets marked. We accept GPS coordinates if provided along with detailed driving directions.

**2. We Notify Member Facility Operators**

Texas811 will tell you which facility operators will be notified about your excavation near their underground lines.

We will provide you with a **reference number** that serves as a proof of your call. We also keep a complete record of your call to verify your compliance with the law.

**3. The Facility Operators Respond by marking their buried lines or other response.**

Facility operators will mark their underground lines, as they determine necessary, and you will be able to work safely without delay. [Marking Examples](#)

**4. Your excavation project proceeds safely.**

Begin your project knowing that you are utilizing safe excavation practices while preserving vital services, protecting property and **saving lives!**

**Know what's below... call before you dig!**

### Color Code

#### For Marking Underground Utility Lines



**White - Proposed excavation**



**Pink - Temporary survey markings**



**Red - Electric power lines, cables, conduit and lighting cables**



**Yellow - Gas, oil, steam, petroleum or gaseous materials**



**Orange - Communication, alarm or signal lines, cables or conduit**



**Blue - Potable water**



**Purple - Reclaimed water, irrigation and slurry lines**



**Green - Sewer and drain lines**



## Water Features

[Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated. This report shows only the major soils in each map unit]

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit Ft	Lower limit Ft	Surface water depth Ft	Duration	Frequency	Duration	Frequency
HeB: Herty	D	---	January	0.5-1.0	0.5-2.0	---	---	None	---	None
			February	0.5-1.0	0.5-2.0	---	---	None	---	None
			March	0.5-1.0	0.5-2.0	---	---	None	---	None
			April	0.5-1.0	0.5-2.0	---	---	None	---	None
Kp: Koury	C	---	January	2.5-3.5	>6.0	---	---	None	Brief	Frequent
			February	2.5-3.5	>6.0	---	---	None	Brief	Frequent
			March	2.5-3.5	>6.0	---	---	None	Brief	Frequent
			April	2.5-3.5	>6.0	---	---	None	Brief	Frequent
			May	---	---	---	---	None	Brief	Frequent
			December	2.5-3.5	>6.0	---	---	None	---	None
KuB: Kurth	C	Low	January	2.5-3.1	3.4-4.3	---	---	None	---	None
			February	3.4-4.3	4.7-5.7	---	---	None	---	None
			March	2.5-3.1	3.4-4.3	---	---	None	---	None
			April	3.4-4.3	4.7-5.7	---	---	None	---	None
			December	2.5-3.1	3.4-4.3	---	---	None	---	None
				3.4-4.3	4.7-5.7	---	---	None	---	None
				2.5-3.1	3.4-4.3	---	---	None	---	None
				3.4-4.3	4.7-5.7	---	---	None	---	None

## Water Features

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Surface water depth	Ponding		Flooding	
				Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
				Ft		Ft				
KuD: Kurth	C	---	January February March April December	2.5-3.5 2.5-3.5 2.5-3.5 2.5-3.5 2.5-3.5	3.5-5.0 3.5-5.0 3.5-5.0 3.5-5.0 3.5-5.0	---	---	---	---	None None None None None
MsB: Moswell	D	---	Jan-Dec			---	---	---	---	None
MxA: Moten	C/D	---	January February March April	1.0-2.5 1.0-2.5 1.0-2.5 1.0-2.5	5.0->6.0 5.0->6.0 5.0->6.0 5.0->6.0	---	---	---	---	None None None None
Multey	B	---	January February March April	4.0->6.0 4.0->6.0 4.0->6.0 4.0->6.0	>6.0 >6.0 >6.0 >6.0	---	---	---	---	None None None None
PeB: Penning	C	---	January February March April	1.5-4.0 1.5-4.0 1.5-4.0 1.5-4.0	2.5-5.0 2.5-5.0 2.5-5.0 2.5-5.0	---	---	---	---	None None None None

# Wetlands Guidance

The soil types listed on the chart below are found on your property and have been listed on the "**Hydric Soils of Texas**" list. Refer to the soil map in your Water Quality Management Plan for location of soil types on your property.

Areas on your property that have the potential to be wetlands exhibit the following characteristics:

- 1). Seasonally wet or frequently standing in water;
- 2). Wetland type vegetation;
- 3). Soils that are listed on the NRCS "**Hydric Soils of Texas**" list;
- 4). Flooded areas.

Since December 23, 1985, if you or anyone has performed or plans to perform any construction, brush clearing, conversion of woodland to grassland, or other land disturbing activities in those areas, you should **contact the local Soil & Water Conservation District (SWCD) or Natural Resource Conservation Service (NRCS)** office in your county to assist you with determining if your past or proposed activity impacts any wetland areas.

This step will help ensure you remain in compliance with Section 404 of the Federal Clean Water Act of 1972 and its subsequent amendments and the "Swampbuster" provisions of the Food Security Act of 1985.

Soil Type Code	Soil Type Name
<p>According to the Natural Resources Conservation Service soil survey there are no hydric soils present on this property.</p> <p>If there were hydric soils present on this property, the soil type and name would be listed here.</p>	



The producer's signature indicates that this guidance sheet has been discussed with him/her.

\_\_\_\_\_  
Producer

\_\_\_\_\_  
Date