pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATERSHED RESTORATION AND
NONPOINT SOURCE MANAGEMENT

LAND APPLICATION OF MANURE
A Supplement to Manure Management for Environmental Protection

MANURE MANAGEMENT PLAN WORKBOOK

**To Be Completed, Implemented and Retained
By All Agricultural Operations that Land Apply Manure or
Agricultural Process Wastewater Unless the Requirements
Described in 25 Pa. Code § 91.36(b) are Met in Another Way
Such as a Permit or Approval from the
Department of Environmental Protection or completion of
the Manure Management Plan Short Form.**

MANURE MANAGEMENT PLAN WORKBOOK INSTRUCTIONS

The Manure Management Plan Workbook Instructions describe the required criteria for developing and implementing a manure management plan using the Manure Management Plan Workbook standard format.

The Manure Management Plan Workbook has a checklist and seven sections as outlined below.

Section 1 – General Information. This section includes general information about the agricultural operation. **The Date of Development, Contact Information, and Operation Information are always required as part of a completed Manure Management Plan Workbook. The Animals Worksheet is required if livestock or poultry are managed on the agricultural operation.**

Section 2 – Mechanical Manure Application. This section documents manure application rates and timing for mechanical application of manure. **This section is required in a complete Manure Management Plan Workbook if manure is mechanically applied on the agricultural operation.**

Section 3 – Operation Map. This section provides an operation map identifying the location of fields, structures, environmentally sensitive areas, and manure application setbacks. **This section is always required in a complete Manure Management Plan Workbook.**

Section 4 – Manure and Agricultural Process Wastewater Storage Facilities and Stockpiling/Stacking Areas. **This section is necessary if the agricultural operation generates agricultural process wastewater, maintains manure storage facilities, or stockpiles or stacks manure.**

Section 5 – Pasture Management. **This section is necessary if the agricultural operation maintains one or more pasture fields.**

Section 6 – Animal Concentration Areas (ACAs). **This section is necessary if the agricultural operation maintains one or more ACAs** (barnyards, feedlots, animal exercise areas).

Section 7 – Recordkeeping. This section provides a description of required recordkeeping and provides forms that can be used for recordkeeping. **This section is always required in a complete Manure Management Plan Workbook.**

To determine what sections are necessary for the operation, the Manure Management Plan Workbook Checklist on Page 1 of the Manure Management Plan Workbook should be reviewed and completed while consulting the section descriptions above.

To complete the Manure Management Plan Workbook Checklist, mark an “X” under the appropriate column heading (“Completed or Reviewed” and/or “Not Needed”) next to the worksheet titles that were evaluated. All worksheet titles should be reviewed.

An example of completed Manure Management Plan Workbook Checklist is located in the Manure Management Plan Workbook Example

Section 1 – General Information

This section includes the date the plan was developed or updated, contact information for the plan listing the agricultural operation name and address, and the plan preparer name and address. Also included is an agricultural operation information page which provides general information about the agricultural operation and, depending on the responses, directs the operator or planner to other sections of the plan that must be completed. Additionally, the Animals Worksheet is included in this section and must be completed if livestock or poultry are managed on the operation.

1. Date of Development

Identify the date the plan was developed and/or the date the plan was updated on page 2 of the Manure Management Plan Workbook.

Note that the landowner/operator should review the manure management plan annually and must update the plan when necessary to keep the plan consistent with operation and manure management practices.

An example of completed Date of Development is located in the Manure Management Plan Workbook Example.

2. Contact Information

Insert the contact information for the agricultural operation on page 2 of the Manure Management Plan Workbook. Include the name of the operator, landowner(s), the physical and mailing address of the operation, and the phone number and email of the operator.

If the plan is prepared by someone other than the operator, include the name, address, and phone number of the person that prepared the plan under the Manure Management Plan Preparer Contact Information heading on the contact information page.

An example of completed Contact Information is located in the Manure Management Plan Workbook Example.

3. Operation Information

Complete the appropriate response on the Operation Information Page in the Manure Management Plan Workbook.

a. List the **crop rotation(s)** used on the agricultural operation.

b. List the number of acres, owned and/or rented, available for **mechanical manure application**. Pasture acres should be noted once, in letter c.

c. If the agricultural operation contains pasture, list the number of acres, owned and/or rented, used for **pastures.** If the agricultural operation has or uses pasture areas, the operator must complete the Pasture Management Worksheet in the Manure Management Plan Workbook.

d. Add b + c for the total acres available for manure, and identify the total in item d.

e. Identify if **animals** are on the agricultural operation. If animals are on the agricultural operation, operator must complete the Animals Worksheet in the Manure Management Plan Workbook.

f. Identify any **environmentally sensitive areas** located on the agricultural operation and rented land or within 100 feet from the property boundary of the agricultural operation or rented land. If any environmentally sensitive areas are identified, the operator must complete the Environmentally Sensitive Areas Worksheet in the Manure Management Plan Workbook and mark these areas on the operation map to be used by the manure applicator.

g. Indicate whether there will be mechanical **application of manure during winter**. If so, complete the Winter Application Worksheet in the Manure Management Plan Workbook. Winter application is the mechanical application of manure from December 15 through February 28, anytime the ground is frozen at least four inches, or anytime that the ground is snow-covered.

h. Identify if **agricultural process wastewater** is generated on-site. Agricultural process wastewater is wastewater from agricultural operations, washing, cleaning or flushing pens, milk houses, barns, manure pits, direct contact swimming, washing or spray cooling of livestock or poultry, egg washing, or dust control. If so, complete the Agricultural Process Wastewater Worksheet in the Manure Management Plan Workbook.

i. Indicate if the agricultural operation has any **manure storage facilities**. If the agricultural operation has any manure storage facilities, including concrete tanks, metal or other fabricated tanks, under-building structures, earthen or synthetically-lined manure storage ponds or lagoons, or solid manure stacking pads, the operator must complete the Manure Storage and Stacking Worksheet in the Manure Management Plan Workbook.

j. Indicate whether the agricultural operation has any **solid manure stockpiling/stacking areas.** If the agricultural operation has manure stockpiling/staking areas (either at the barn (farmstead area) or in crop fields), complete the Manure Storage and Stacking Worksheet in the Manure Management Plan Workbook.

k. If the agricultural operation has any **Animal Concentration Areas (ACAs)**, identify if they are located on owned or rented land. ACAs are barnyards, feedlots, loafing areas, exercise lots or other similar animal confinement areas as outlined in the glossary of the Land Application of Manure Supplement. Agricultural operations with ACAs must complete the ACA Worksheet in the Manure Management Plan Workbook.

l. Indicate if the manure spreader used to mechanically apply manure will be calibrated prior to manure application. Refer to Agronomy Facts 68 found in Appendix 3 of the Land Application of Manure Supplement for manure spreader calibration procedures.

An example of a completed Operation Information Page is located in the Manure Management Plan Workbook Example.

4. Animals Worksheet

This worksheet is required if animals are housed on the operation. Complete calculations 1 and 2 as described on the Animals Worksheet of the Manure Management Plan Workbook.

If it is determined that an operation has an animal density of greater than 2 AEUs/acre and eight or more total AEUs, the operation is considered a CAO and is then regulated under Pennsylvania's Nutrient Management Act (Act 38). In the event an operation is determined to be a CAO, the operator should consult with a certified nutrient management specialist before proceeding with the remainder of the Manure Management Plan Workbook.

Calculation 1.

a. Identify the Animal Type in Column (a).

b. Identify the number of animals housed on-site on a normal production day in Column (b).

c. Refer to *Agronomy Facts 54, Pennsylvania's Nutrient Management Act (Act 38): Who is Affected?* found in Appendix 2 of the Land Application of Manure Supplement. According to the weights identified in Agronomy Facts 54, identify the average weight of each animal in Column (c).

d. Animal Unit (AU): Complete the following equation and place the result in column (d):

Column (b) × Column (c) ÷ 1,000 = Column (d)

e. Identify the number of days per year the animals are housed on-site in column (e).

f. Animal Equivalent Unit (AEU) per Animal Type: Complete the following equation and place the result in column (f).

Column (d) × Column (e) ÷ 365 = Column (f)-4

g. Add all AEUs identified in column (f), and record the total in the box next to the word "Total"

Calculation 2.

a. Enter the total from Column (f) in Calculation 1 next to Total AEUs.

b. Enter the total from the Operation Information Page, Letter d, next to the total acres available for manure.

c. AEUs per Acre: Complete the following equation and place the result in the space next to AEU/Acre.

Total AEUs listed above ÷ Total Acres listed above = AEU/Acre

An example of a completed Animals Worksheet is located in the Manure Management Plan Workbook Example.

Section 2 – Mechanical Manure Application

This portion of the plan includes four components related to mechanical application of manure: environmentally sensitive areas, plan requirements for winter application and the application rates and timing for each crop group. The plan must include manure and agricultural process wastewater from all sources including manure generated on the agricultural operation and manure imported to the agricultural operation.

The information developed under this section is placed on the Manure Management Plan Summary in the Manure Management Plan Workbook. The operator must apply manure according to the completed summary to meet the Manure Management Plan requirements within the Manure Management Plan Workbook.

1. Environmentally Sensitive Areas Worksheet

Operators may not mechanically apply manure within the following areas, regardless of the slope of the land or the ground cover:

a. Within 100 feet of the top of the bank of a stream or spring which flows during the time of year when manure is being applied and within 100 feet of a lake or a pond. The setback to an intermittent stream or spring is only applicable to manure applications when the stream or spring is flowing. A stream or spring does not include a culvert outlet or a roadside swale that drains stormwater into a field where the stormwater infiltrates into the ground.

* An operator can reduce this stream, spring, lake or pond setback to 50 feet where a soil test done within the last three years shows phosphorus levels (Mehlich 3-P levels) of less than 200 parts per million (ppm) and the operator uses no-till practices and if residue is removed, plants a cover crop on the field.

* The stream, spring, lake, or pond setback can be further reduced to 35 feet where the operator establishes or maintains a 35-foot permanent vegetated buffer along the water body.

The 100-foot stream, lake, springs, and pond setback cannot be reduced by implementing the practices listed above for manure applied during the winter period. Winter applied manure requires a 100-foot setback from streams, springs, lakes, and ponds regardless of conservation practices used within that 100-foot distance.

b. Within 100 feet of an existing open sinkhole.

c. Within 100 feet of an active private drinking water source such as a well or a spring.

d. Within, at a minimum, 100 feet of an active public drinking water source. In some cases, state and federal laws may establish greater distances.

e. Within the channel of a non-vegetated concentrated water flow area such as a swale, gully, or ditch. For example, this would include a rock lined swale, but would not include a grassed waterway.

f. For winter application, a setback of 100 feet from an above ground inlet to an agricultural drainage system (such as inlet pipes to piped outlet terraces) where surface water flow is toward the above ground inlet.

On the Environmentally Sensitive Areas Worksheet of the Manure Management Plan Workbook:

a. Identify each field (both owned and rented) that contains or borders on an environmentally sensitive area.

b. Identify the environmentally sensitive area feature type.

c. Identify the setback distance for mechanical application of manure (see discussion above).

Additionally, the setback or restricted areas associated with all environmentally sensitive areas should be shown on the Operation Map in the Manure Management Plan Workbook.

An example of a completed Environmentally Sensitive Areas Worksheet is located in the Manure Management Plan Workbook Example.

2. Winter Application of Manure Worksheet

For purposes of this portion of the Manure Management Plan, winter includes any one of the following:

a. December 15 through February 28; **or**

b. Anytime the ground is frozen at least four inches; **or**

c. Anytime that the ground is snow covered.

Winter application can lead to significant environmental problems if manure is not prevented from getting into streams, lakes, springs, and ponds. Winter application is discouraged. DEP encourages operators to seek other management solutions such as solid manure stacking and liquid manure storage. Operators that apply manure in the winter will need to meet the following criteria:

a. The maximum application rate **for the winter season** is 5,000 gallons per acre of liquid manure or 20 tons per acre of dry non-poultry manure per acre or three tons of dry poultry manure per acre.

b. A setback of 100 feet from an above-ground inlet to an agricultural drainage system (such as inlet pipes to piped outlet terraces) where surface water flow is toward the above-ground inlet.

c. All fields must have at least 25% crop residue at application time or an established and growing cover crop. Hay fields, sod and pasture fields and fields with an established cover crop should be given highest priority for winter application.

   * The 25% crop residue provision generally excludes winter manure application to corn silage fields that do not have an established cover crop, corn grain fields where a significant portion of the fodder has been removed, and low yielding soybean fields.

d. Manure may not be applied during winter on fields with slopes greater than 15%. NRCS soil survey slope designations of “A,” “B,” or “C” slopes are acceptable for winter application determinations.

e. An application setback of 100 feet from the top of the bank of a stream which generally flows during the winter or spring, and within 100 feet of a lake or a pond, along with all the other application setbacks outlined in Section 2.1.

Operators using a Certified Nutrient Management Planner to develop a nutrient management plan for the agricultural operation using the Act 38 plan format, or obtaining approval from DEP or county conservation district, may be provided added flexibility in the application of manure during the winter.

On the Winter Application Worksheet of the Manure Management Plan Workbook:

a. Identify each field (both owned and rented) where there may be winter spreading by mechanical means.

b. Identify whether the manure is liquid or solid and the type of livestock or poultry generating the manure.

c. Identify the selected application rate of manure for the winter season for each field where winter application is planned to occur.

   * The maximum application rate **for the winter season** is 5,000 gallons per acre of liquid manure or 20 tons per acre of dry non-poultry manure per acre or three tons of dry poultry manure per acre.

d. For each field, identify the percentage of crop residue and the type of residue or vegetative cover that will be growing on the field in the winter.

   * A minimum of 25% of crop residue on all fields or established and growing vegetative cover is required at the time of manure application. For instructions on how to calculate the percentage of crop residue, contact the local county conservation district or NRCS for assistance.

e. Identify the average slope of the field where winter application will take place. The slope cannot exceed 15%.

   * Field slope designations will generally be identified in the operator’s Agriculture Erosion and Sediment Control Plan (Ag E&S Plan), if applicable. Further assistance may be available through the local NRCS office, conservation district, or a Certified Nutrient Management Planner.

Identify any environmentally sensitive areas and the associated setbacks in the winter application fields on the Environmentally Sensitive Areas Worksheet and in Operation Map in the Manure Management Plan Workbook.

An example of a completed Winter Application Worksheet is located in the Manure Management Plan Workbook Example.

3. Manure Management Plan Summary (Application Rates and Timing)

The Manure Application Plan Summary must describe the manure application rate(s) by crop group and must include manure imported to the agricultural operation. It is a summary sheet of the manure application amounts and timing developed using the processes described below. This summary is used by the manure applicator to identify acceptable application rates.

In determining manure application rates, operators have three options.

a. Use the phosphorus removal values from the Manure Application Rate Tables in Appendix 1 based on the crop group and manure type; **or**

b. Establish application rates based on the applicable Nitrogen or Phosphorus Balance Worksheets (NBS) (not including the PA Phosphorus Index option); **or**

c. Have an individual trained to implement the Pa Phosphorus-Index (such as a Certified Nutrient Management Specialist, a Manure Hauler or Broker or other individual who has received PA Phosphorous Index training) develop this section of the plan using the "PA Phosphorus Index".

It is acceptable to use a combination of approaches when calculating nutrient application rates.

Any operations that are utilizing commercial fertilizers, biosolids, or food processing residuals must utilize the Nutrient Balance Sheet or Phosphorous Index when planning for Manure application rates and timing.

a. **Manure Application Rate Tables – Appendix 1 provides detailed instructions on how to determine phosphorous removal rates for manure application using these charts.** To use the charts in Appendix 1, the operator must know at least the type of manure, the crop to be grown and the realistic optimum crop yield. These charts have only been developed for the maximum annual phosphorous removal rate application of common manure types and crops found in Pennsylvania. If the operator would like to apply nutrients above the phosphorous removal rate (not to exceed the nitrogen needs of the crop), other manure types, or to other crops not included in the charts, the **NBS** or the **Phosphorus Index (Option 3 on the Balance Sheet)** (developed by an authorized planner) must be used. The NBS is available from the DEP regional office, county conservation district, Penn State Extension office, Certified Nutrient Management Specialist or at https://extension.psu.edu/programs/nutrient-management/tools/sheet.

b. The agricultural operator may apply manure to the nitrogen needs of the crop if a soil test for phosphorous taken in the past three years shows soil phosphorous levels less than 200 ppm (Mehlich 3-P levels) and the application rate was determined using the **NBS or Phosphorous Index (Options 3 on the Balance Sheet).**

c. To determine mechanical application rates on pasture, first account for any manure directly deposited by livestock, poultry, or equine as Other Organic Sources Applied, row "C" on the NBS.

On the Manure Management Plan Summary of the Manure Management Plan Workbook:

a. List the crop groups (based on crop type and realistic expected yield) and realistic optimum expected yields for all the crops grown on the agricultural operation and any rented property in the first column.

   * If the agricultural operation uses more than one manure group on the crop, a separate crop listing should be provided for each manure group. Additionally, if manure is applied in multiple seasons, the plan should show a line for application for each season. For example, a grass hay crop receiving manure in both spring and summer would require two lines in the summary. One line with the spring application rate listed, and separate line for application in the summer, with the summer application rate listed.

b. List the manure group to be used on the crop group (such as solid dairy, liquid dairy, liquid swine, solid layer, solid broiler, etc.).

c. List the application season, Spring, Summer, Fall, or Winter.

   * Each crop group where winter application is planed must be evaluated using the **Winter Application** W**orksheet** in the Manure Management Plan Workbook.

d. List the application rate for each application of manure. For liquid manure the rate is expressed in gallons per acre and for solid manure the rate is expressed in tons per acre.

* For liquid manure, no single application can exceed 9,000 gallons unless applied in accordance with § 83.294(e). If any application rates are greater than 9,000 gallons, then split the application into multiple applications with no evidence of pooling between applications.

Identify the method for calculating the application rate. Use "C" if the rate comes from the **Manure Application Tables** in Appendix 1, "NBS" if the rate comes from a **Nitrogen or Phosphorus Nutrient Balance Worksheet** and "PI" if the rate was developed by an authorized planner using the **Phosphorus Index.**

e. List the application season and incorporation timing. Incorporation timing is the number of days after application of manure before the manure is mechanically incorporated using equipment such as an injector system, a disk, field cultivator, or chisel.

f. When applicable, list the commercial Nitrogen and Phosphorus fertilizer planned to meet crop nutrient needs for the various crop groups.

g. List the fields where the crop group may be used.

Identify if soil tests were taken in the past three years and if the results indicate soil phosphorous levels (Mehlich 3-P) less than 200 ppm in the checkbox below the table.

An example of a completed Manure Management Plan Summary is located in the Manure Management Plan Workbook Example.

Section 3 – Operation Map

The Manure Management Plan Workbook must include a map or maps identifying the lands included in the plan. An excellent map on which to record the necessary Manure Management Plan information is the Agricultural Erosion and Sediment Control Plan (or Conservation Plan) map. The operator can also use a U.S. Geological Survey (USGS) map or a "hand drawn" map. Penn State University's PAOneStop found at the following link, https://paonestop.psu.edu/nutrientmgmt/login.aspx, is an excellent resource for developing a map.

The map should be inserted on page 9 of the Workbook.

The map must identify:

1. The boundaries of the agricultural operation.
2. Individual field boundaries for all fields included in the plan.
3. Field identifiers (name or number) and acreage of each field.
4. The identification of average slopes or the average NRCS slope designation for all fields being used for winter application. An NRCS soil survey map can be used to satisfy this requirement. These soil maps are available at the county conservation district or NRCS office. Soil maps can also be obtained using the NRCS Web Soil Survey website at https://websoilsurvey.nrcs.usda.gov/app/.
5. The location of all environmentally sensitive areas and setbacks identified on the Environmentally Sensitive Areas Worksheet.
6. The location of proposed or existing manure storage facilities.
7. The location of manure stockpiling or stacking areas.
8. The location of all pastures.
9. The location of all Animal Concentration Areas.
10. The location and names of all roads adjacent to or within the agricultural operation.

An example of a completed Operation Map is located in the Manure Management Plan Workbook Example.

Section 4 – Manure and Agricultural Process Wastewater Storage and Stockpiling/Stacking Areas

1. Agricultural Process Wastewater Worksheet

If any agricultural process wastewater is generated on-site (water system overflow, wash water, milk house wastewater, egg wash water, etc.), the Agricultural Process Wastewater Worksheet must be completed.

Regardless of if the agricultural process wastewater is stored separately or added to manure, the planned application, transfer, and/or storage of all agricultural process wastewater must be described in the Manure Management Plan Workbook on the following:

1. Plan Summary Worksheet
2. Manure Storage and Stacking Worksheet, and/or
3. Transfer Records

If the agricultural process wastewater is handled in some other way, that method must be described on the Agricultural Process Wastewater Worksheet in the Manure Management Plan Workbook.

The Manure Management Plan Workbook must list all types of agricultural process wastewater generated on-site. If the agricultural process wastewater is directed to a manure or waste storage facility, that facility must be identified in the Agricultural Process Wastewater Worksheet. If the agricultural process wastewater is handled in some other way, the operator should consult with the county conservation district, NRCS, or a private consultant for management recommendations and technical assistance. The plan developed in consultation with the conservation professionals listed above, must be recorded on the Agricultural Process Wastewater Worksheet. Use multiple pages if necessary.

On the Agricultural Process Wastewater Worksheet in the Manure Management Workbook:

1. Identify the type of agricultural process wastewater generated on-site.
2. Identify if the agricultural process wastewater is directed to a manure or waste storage facility.
    a. List the manure or waste storage facility identified on the Manure Storage Worksheet that receives the agricultural process wastewater.
    b. If the agricultural process wastewater is not directed to a manure or waste storage facility, the operator should immediately contact the county conservation district, NRCS, or a private consultant for management recommendations and technical assistance and list the date of contact, and name and affiliation of the person contacted.
        i. After consulting with a conservation professional listed above, describe the management strategies for agricultural process wastewater generated on-site as discussed.
        ii. Identify the implementation date or planned implementation date for the management strategies described above.

An example of a completed Agricultural Process Wastewater Worksheet is located in the Manure Management Plan Workbook Example.

2. Manure Storage and Stacking Worksheet

a. Manure Storage Facilities

It must be documented in the Manure Management Plan Workbook how manure and agricultural process wastewater that is not immediately applied is properly stored. Manure storage facilities are used for safely containing manure and agricultural process wastewater until it can be properly applied or processed. Manure storage facilities include earthen ponds or lagoons with various liners such as concrete, bentonite, and/or membrane products like HDPE, concrete tanks located outside or under the barn, above-ground steel tanks, and roofed stockpiling/stacking facilities.

The plan must list all manure storage and stacking areas on the Manure Storage and Stacking Worksheet of the Manure Management Plan Workbook. For liquid or semisolid manure storage facilities, the plan must document the type, date of construction, estimated capacity, and documentation of the environmental evaluation of the structure as outlined below. For constructed solid manure stacking pads/facilities, the plan must document the type, size, date of installation, and any problems identified with the structure.

Liquid or semisolid manure storage must be evaluated by the operator, on at least a monthly basis. Specifically, for liquid or semisolid manure storage facilities, the operator must document that there is:

1. No evidence of overtopping or leakage from the manure storage facility. The operator must maintain a minimum 12-inch freeboard for all ponds and a minimum 6-inch freeboard for all other manure storage facilities at all times.
2. No visible cracking, rodent holes, tree or shrub growth on the berms or other problems with manure storage facilities that would lead to leakage.
3. No visible slope failures, visible deterioration or tears of any liner, or knowledge of any local water pollution issues associated with the storage facility.

No specific monthly documentation is required for constructed solid manure storage facilities.

Written records – such as the Manure Storage Facility Record Monthly Inspection Form in the Manure Management Plan Workbook – must be maintained as part of the Manure Management Plan to demonstrate that these requirements are being met.

Any problems identified in 1-3 above need to be addressed immediately.

In addition, the design and construction of liquid or semisolid manure storage facilities constructed after January 29, 2000 must be certified by a registered professional engineer unless a water quality permit is obtained by the owner or operator. The owner or operator must retain a copy of the certification and provide a copy to DEP or delegated county conservation district upon request.

If the owner or operator does not have a copy of the certification, the owner or operator should contact a registered professional engineer for assistance.

b. Manure Stockpiling/Stacking

Some agricultural operations have one or more stockpiling/stacking areas around the barn (farmstead area) or in the field to handle situations when direct manure application is impractical.

Manure stacking in the farmstead area must use an improved stacking pad or covered area. NRCS, the county conservation district, or a private consultant can provide assistance with this requirement.

The requirements relating to stacking of manure in other areas, (not on the farmstead) such as on crop fields are:

a. Keeping all stockpiles/stacks at least 100 feet from sensitive areas such as streams, springs, lakes, and ponds, 100 feet from any open sinkhole, 100 feet from any drinking water well (public or private). These stacks cannot be placed within an area of concentrated water flow such as a swale, ditch, or waterway.

b. Stockpiling/stacking manure on properly constructed improved stacking pads whenever possible. When stockpiling/stacking on unimproved areas in crop fields, the stockpiles/stacks should not be in the same location each year.

c. Placing these areas at the top of a hill (this includes the area within 100 feet from the top of the slope), where possible, diverting upslope water away from stockpile/stacking areas.

d. Placing stacks on areas with less than 8% slope.

e. The manure must be dry enough to allow for stacking at least four feet in height. When stacked on the application field, the volume needs to be limited to the amount that can be spread on fields nearby to the stack.

f. When stacked on the application field, cover stockpiled/stacked manure with a plastic tarp or other similar water-repellent cover if it will be in place for more than 120 days. Manure stacked on a properly managed improved stacking pad does not need to be covered.

On the Manure Storage and Stacking Worksheet of the Manure Management Plan Workbook:

1. Identify the type of storage(s) and stacking area(s) and the year(s) of construction.
   a. For liquid or semisolid manure storage facilities constructed after January 29, 2000, the owner or operator must obtain a water quality management permit, unless the design and construction of the facility was certified by a registered professional engineer (PE). A copy of the PE certification should be available on-site. Identify “yes” if a copy of the PE certification is available on-site.
   b. If the operator does not have a copy of the certification, the owner or operator should contact a professional engineer for assistance. If a copy is not available on-site, identify the date a PE was contacted.
2. Identify the approximate size and volume of existing liquid and semisolid manure storages and/or the dimensions of existing stacking areas and indicate if the manure storage is exposed to precipitation.
3. Identify any additional materials added to the manure storage(s) or stacking area(s) including bedding, silage leachate and/or agricultural process wastewater. If agricultural process wastewater is added to the storage or generated on-site, the Agricultural Process Wastewater Worksheet in the Manure Management Plan Workbook must be completed.
4. Identify if the agricultural operation has adequate manure storage capacity to implement the Manure Management Plan according to the application recommendations outlined on the Manure Management Plan Summary of the Manure Management Plan Workbook.

   The operator should contact the county conservation district, NRCS, or a private consultant for management recommendations and technical assistance if there is any question regarding the adequacy of manure storage capacity on the agricultural operation.
5. Identify if the requirements for stacking of manure outside the farmstead (such as on crop fields) are met for all applicable stacking areas.
6. Identify any actions or best management practices needed to address identified problems related to manure storage and the planned implementation date (season and year) for each practice or action.

   Examples of problems related to manure storages: *Inadequate storage volume, leaking facilities, inadequate maintenance, runoff from a stack that directly reaches a water body, professional engineer certification is not on site (if applicable) etc.*

An example of a completed Manure Storage and Stacking Worksheet is located in the Manure Management Plan Workbook Example.

Section 5 – Pasture Management

All pastures on the agricultural operation must be listed in the Manure Management Plan and identified on the operation map. Agricultural operations have several choices for managing pastures:

1. The agricultural operation can develop a grazing plan meeting the requirements of the NRCS Pennsylvania Technical Guide Practice Standard 528 for Prescribed Grazing, **or**
2. The operation can manage pastures by minimizing bare spots and maintaining at least three (3) inches of vegetation height and 70% perennial vegetative cover when animals are present on pasture.

If any fields are overgrazed, then those fields should be managed as an Animal Concentration Area (See the Animal Concentration Areas Worksheet). Overgrazing means that the pasture is not meeting either of the pasture management guidelines identified in the above checkboxes.

On the Pasture Management Worksheet:

1. Indicate the planned pasture management approach in the checkboxes provided and the date implemented or planned.
2. Though there is no regulatory requirement to do so, if the agricultural operation is managing pastures in one of the two methods listed above AND animals are excluded from streams, seeps, ponds, and other surface waters AND drinking water is available to all livestock meeting their daily water requirements, the operator should indicate the length of the exclusion fence, the average width of the excluded area, and the date the practice was installed.

An example of a completed Pasture Management Worksheet is located in the Manure Management Plan Workbook Example.

Section 6 – Animal Concentration Areas

Animal Concentration Areas (ACAs) (also called "Animal Heavy Use Areas") are barnyards, feedlots, loafing areas, exercise lots or other similar animal confinement areas are areas that will not meet the pasture management requirements identified on the Pasture Management Worksheet. ACAs do not include areas managed as pastures as described on the Pasture Management Worksheet or cropland. However, ACAs may exist within areas maintained as a pasture and must be addressed. Animal access ways, feeding areas, watering areas, shade areas or walkways are not considered ACAs if water from or precipitation onto these areas does not result in runoff of manure or sediment to streams, lakes, springs, ponds, or open sinkholes.

ACAs need to be managed to:

1. Divert clean water flow from upslope fields, driveways, barn roofs, etc., away from the ACA;
2. Direct polluted runoff or allow it to flow from the ACA area into a storage facility or best management practice such as a correctly sized and well-maintained vegetative filter strip;
3. Limit animal access to surface waters to only properly implemented livestock crossings. Animals may not have free access to streams adjacent to or within ACAs;
4. Minimize the size of denuded areas such as sacrifice lots;
5. Keep areas where animals congregate – such as feed racks, shade, and gates – as far away from a water body as practical to prevent manure runoff into surface water. It is recommended to keep ACAs at least 100 feet away from surface water, unless a vegetated buffer of at least 35 feet in width is used;
6. Where appropriate, include relocation of movable structures creating ACAs – such as hay rings – at least annually where practical, to minimize ACA development and manure concentration; and
7. Routinely, generally four times per year, remove accumulated manure from ACAs, where practical, to minimize the potential for polluted discharges.

Agricultural operations that have ACAs and are using the Manure Management Plan Workbook to meet planning requirements must list the ACA on the Operation Information Page of the Manure Management Plan, complete the Animal Concentration Area Worksheet, and locate the ACA on the operation map. The plan needs to identify Best Management Practices (BMPs) that are currently being implemented to prevent pollution and, where necessary, include a schedule for obtaining assistance to develop and implement additional BMPs that require appropriate expertise in design or where additional time is needed to obtain the financial resources to implement the necessary BMPs.

Operators working with a design professional (conservation district, NRCS, Certified Nutrient Management Planner, etc.) can be provided up to three years from the date the plan is developed to fully implement that plan. However, implementation should begin as soon as possible.

On the Animal Concentration Areas Worksheet:

1. List the date contact was made with an agency or other party to help determine appropriate Best Management Practices (BMPs) to address the ACA. Additionally, list the individual and agency or party that was contacted.
2. Describe the management strategies, current or proposed, for any ACAs on the operation.
3. Complete the BMP schedule. Identify the date implemented in the "Date" row of the ACA block if BMP has been implemented. List the planned date for implementation in the "Date" row of the ACA block if the BMP is planned. If installed, list the amount installed in the units listed in the "Amount" row of the ACA below. Record N/A if the BMP does not apply.

An example of a completed Animal Concentration Areas Worksheet is located in the Manure Management Plan Workbook Example.

Section 7 – Recordkeeping

Operators are required to maintain two types of records. First, the Manure Management Plan Short Form or the Manure Management Plan Workbook including all applicable worksheets must be retained and be made available to DEP or the county conservation district upon request. Second, the operators must maintain records to demonstrate that the Manure Management Plan has been implemented. Again, these records must be made available to DEP or the county conservation district upon request.

The Manure Management Plan Workbook contains optional blank reporting forms that the operator can use to document that they are properly implementing the manure management plan requirements. Each of these records covers one calendar year of manure application. These records must be retained for a period of at least three years and must be available for review by DEP or the county conservation district upon request.

The Manure Management Plan Workbook Example includes completed recordkeeping forms.

1. Manure Application Records

Manure application records demonstrate that the field application requirements of the Manure Management Plan are being implemented and may be recorded on the Manure Application Rate Record form. The notes column is optional and may be utilized to record information relevant to the time of manure application including weather or ground conditions on the day(s) of, prior, or after manure application.

2. Crop Yield Records

Crop yield records demonstrate that the yield goal for the crop was attained in the calendar year and may be recorded on the Crop Yield Record form. The notes column is optional and may be utilized to record information relevant to crop yield.

3. Manure Transfer Records

Manure transfer records demonstrate the destination, type, and amount of manure transferred off the agricultural operation. The Manure Transfer Record form may be used to record the necessary transfer information.

4. Manure Storage Records

To prevent discharges of manure from manure storage facilities, it is important to inspect these facilities on at least a monthly basis. The Manure Storage Facility Record Monthly Inspection Form is used for these routine inspections. Whenever a problem is identified, the operator must immediately take steps to resolve the problem.

Note: Manure Depth (column 3) plus Depth of Surface of Manure to Freeboard (column 4) plus freeboard should equal the total storage depth.

Next Steps

Once all applicable worksheets in the Manure Management Plan Workbook and associated recordkeeping documentation are complete, they become the agricultural operation's Manure Management Plan which must be implemented pursuant to 25 Pa. Code § 91.36(b).

The applicable worksheets in the Manure Management Plan Workbook and associated recordkeeping documentation must be maintained on the operation and made available to staff from DEP or the county conservation district upon request.