

## **Agricultural Nutrient Management Requirements In Pennsylvania<sup>1</sup>**

**Pennsylvania Clean Streams Law** — Under the Clean Streams Law it is unlawful to discharge pollutants to surface or groundwater except as allowed by regulations or a DEP permit. All agricultural operations are subject to the provisions of the Clean Streams Law. Generally speaking, activities on agricultural operations that could result in pollution are only allowed if best management practices are implemented to comply with water quality protection standards. Agricultural activities that result in the release of nutrients that pollute surface or groundwater could result in enforcement actions. This risk of an enforcement action is greatest when pollution from these activities occurs during conditions up to and including 25 year/24 hour storm events<sup>2</sup> for production and manure storage areas, and 10 year/24 hour storm events<sup>3</sup> in fields where nutrients are applied, or when pollution from these areas impairs designated water uses.

### **DEP Regulations for All Farms (25 Pa. Code § 91.36)**

- a. All Manure<sup>4</sup> Storage Facilities<sup>5</sup>
  1. *Design/operation:*
    - a) Must be designed, operated and maintained to prevent discharges:
      - i. No discharges to surface and groundwater, up to a 25 year/24 hour storm
      - ii. New/expanded swine, veal and poultry Concentrated Animal Feeding Operations (CAFOs) after 4/13/03 -- 100 year/24 hour storm.
    - b) Liquid and semi-solid manure storage facilities must have adequate freeboard
      - i. New or expanded after 1/29/00 and > 1000 Animal Equivalent Units<sup>6</sup> (AEUs): 24” (or 6” for enclosed)
      - ii. All others: 12” for earthen (lined or unlined) ponds and 6” for structural
  2. *DEP permit:* Required unless the Manure Management Manual and the *Pennsylvania Technical Guide* Standards are followed<sup>7</sup>, and:

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<sup>1</sup> This is a summary of current legal requirements, and available guidance, for all farms in Pennsylvania. Details are contained in the regulations. Other requirements may also apply in certain circumstances, such as where the farm is in a Special Protection watershed. A separate summary describes legal requirements for erosion and sediment control.

<sup>2</sup> In PA, depending on your location, this can range from 4.1” to 5.8” of rainfall. County specific data is available in DEPs Erosion and Sediment Pollution Control Manual or your local county conservation district

<sup>3</sup> In PA, depending on your location, this can range from 4.7” to 7.3” of rainfall. County specific data is available in DEPs Erosion and Sediment Pollution Control Manual or your local county conservation district

<sup>4</sup> Manure – animal excrement, including poultry litter, which is produced at an agricultural operation. It includes bedding and raw materials which are commingled with that excrement.

<sup>5</sup> Manure storage facility – permanent structure or pond, a portion of a structure or pond, or a group of structures or ponds at one agricultural operation, used to contain manure or agricultural process wastewater. This includes concrete, metal or other fabricated tanks or under building structures, as well as earthen and synthetically-lined manure storage ponds.

<sup>6</sup> An animal equivalent units is 1,000 pounds of live animal weight

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- a) For new or expanded liquid and semi-solid manure storage after 1/29/2000:
    - i. If not certified by a licensed Professional Engineer as meeting the Manure Management Manual and applicable NRCS standards
    - ii. Any operation > 1000 AEU's
  - b) Also, for new or expanded liquid and semi-solid manure storage after 10/22/2005 if:
    - i. Pond with total capacity > 1 million gallons and in watersheds of HQ/EV streams<sup>8</sup> or agricultural nutrient impaired stream segment<sup>9</sup>
    - ii. Any facility with a total capacity > 2.5 million gallons
- b. Land application of manure
1. *Setbacks*: Minimum 100' manure application setback or 35' vegetative buffer<sup>10</sup> from certain surface waters (streams with a defined bed and bank, lakes and ponds)
    - a) For all CAOs, CAFOs and their importers
    - b) For CAFOs, setbacks also apply to all surface waters, and conduits to surface waters
  2. *DEP permit*: required unless follow Manure Management Manual<sup>11</sup>, except:
    - a) CAFOs<sup>12</sup>: DEP CAFO permit always required
    - b) CAOs<sup>13</sup>: must follow Nutrient Management Plan required by State Conservation Commission (SCC) (no DEP permit required unless also a CAFO)
- c. Overall legal requirement: Unlawful to discharge pollutants from an agricultural operation to surface or groundwater unless permitted or authorized under DEP regulations. Unlawful discharges, including those from fields, silage and manure storage areas, milkhouses, barnyards and animal concentration area, are subject to enforcement,

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<sup>7</sup> PA Tech Guide specifies design standards and a written O&M plan for manure storage. The Manure Management Manual specifies system designs based on a nutrient management plans and proper O&M

<sup>8</sup> As identified on DEPs Chapter 93 list

<sup>9</sup> As identified on DEPs 303 (d)list

<sup>10</sup> Vegetated buffer – permanent strip of dense perennial vegetation established parallel to the contours of and perpendicular to the dominant slope of the field to slow water runoff, enhance water infiltration, and minimize the risk of any potential pollutants from leaving the field and reaching surface waters. Buffer and setback areas can continue to be used for crop production and pasturing animals. Under the setback option, nutrients, if needed, will have to be provided by sources other than mechanically applied manure. Pasturing in the setback areas is done under a managed system that minimizes stream and stream bank damage and avoids over-grazing of the vegetative cover. If buffer areas are used for crop production or pasturing animals, the farming practices implemented in those areas meet appropriate specifications and criteria depending on the intended use of the area. Under the buffer option, management plans are for crop and pasture uses in these areas assure that the buffer's design capacity to remove sediments and nutrients is maintained. Buffer areas are managed in such a way as to control invasive and noxious plant species.

<sup>11</sup> Manure Management Manual specifies a current written plan that balances nutrient applications with crop needs, record keeping and BMPs to protect water quality.

<sup>12</sup> See below

<sup>13</sup> See below

**DEP's Manure Management Manual** – This manual, along with the *Pennsylvania Technical Guide* – for manure storage and the Penn State Agronomy Guide - for land application, identifies the the preferred practices to comply with § 91.36 . These practices are similar to those in the SCC's nutrient management program for CAOs except for minimum setback/buffer requirements and accounting for the use of exported manure. Also, required plans need not be prepared by a certified specialist or approved unless required by the department.

a. Manure storage facilities

1. BMPs for manure storage and management follow NRCS standards for design, installation, operation and maintenance.
2. Liquid and semi-solid manure storage systems are designed, construction overseen and certified to meeting standards by a Professional Engineer, or DEP permit/approval needed (some large storages will always require a permit<sup>14</sup>)

b. Land application of manure

1. Manure generation and application rates follow the Penn State *Agronomy Guide*, Soil Fertility Management Section including Soil Testing, Typical Plan Nutrient Recommendations and Manure Nutrient Management.
2. Manure nutrient application rates do not exceed the crop nutrient needs (after accounting for residual nutrients and other applied nutrients).
3. Manual revisions in 2006 will describe both nitrogen and phosphorus (based on the options available for P-based planning) considerations following the Nutrient Management regulation update.

c. Manure Management Plans

1. Written Manure Management Plan includes:
  - a) Critical BMPs for manure management and storage; including BMPs for fields, silage and manure storage areas, milkhouses, barnyards and Animal Concentration Areas
  - b) Calculations for manure generation and nutrient availability for the operation
  - c) Crop field and pasture management plans including methods, timing and rates of all nutrient applications (total nutrients not to exceed crop and forage needs)
  - d) Guidelines and special conditions for manure management and application for efficient use of nutrients and environmental protection
  - e) Maps to scale identifying the fields, pastures and BMPs in the plan
2. Written Manure Management Plan need not be developed by certified specialists or approved by DEP, unless requested by the department

d. Records

1. Records are kept on manure (and other nutrient sources) applications and crop yields by field, exported manure and revisions made to the Manure Management Plan.

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<sup>14</sup> Generally, storage systems > 1 million gallons in HQ/EV or Ag impaired watersheds and all > 2.5 million gallons require permits

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2. Current written plan and records for a minimum of past 3 years are maintained on site and available for inspection.

**State Conservation Commission's Regulations for CAOs** (25 Pa. Code Chapter 83) – Additional requirements apply to farms that are CAOs under Act 38 of 2005, which replaced the Nutrient Management Act. Other farms may volunteer to meet these requirements to obtain grant funds and other benefits.

CAOs are agricultural operations with more than two AEUs per acre of land suitable and available for manure application. Contact your local county conservation district for more information.

**DEP CAFO Regulations** (25 Pa. Code § 92.5a) – These regulations implement the federal permit requirements for “concentrated animal feeding operations.” New changes were put in place in October 2005 expanding the definition of a CAFO and adding requirements for water quality protection.

CAFOs now include:

1. Operations with any combination of animals that result in more than 1000 AEUs
2. CAOs with more than 300 AEUs
3. Any operation that exceeds any of the following thresholds:
  - a) 700 mature dairy cows, whether milked or dry;
  - b) 1,000 veal calves;
  - c) 1,000 cattle other than mature dairy cows or veal calves;
  - d) 2,500 swine each weighing 55 pounds or more;
  - e) 10,000 swine each weighing less than 55 pounds;
  - f) 500 horses;
  - g) 10,000 sheep or lambs;
  - h) 55,000 turkeys;
  - i) 30,000 laying hens or broilers, if using a liquid manure handling system;
  - j) 125,000 chickens (other than laying hens) if using a dry handling system;
  - k) 82,000 laying hens if using a dry handling system;
  - l) 30,000 ducks, if using a dry manure handling system;
  - m) 5,000 ducks, if using a liquid manure handling system.

These operations are required to obtain a permit from DEP. Failure to obtain a permit is a violation of state and federal law, and violators are subject to citizen suits. The permit requires an approved Nutrient Management Plan under Chapter 83. Contact your regional DEP office for more information.

## **Erosion And Sediment Control Requirements for Agricultural Operations In Pennsylvania**

**Pennsylvania Clean Streams Law** – Under the Clean Streams Law it is unlawful to discharge pollutants to surface or groundwater except as allowed by regulations or a DEP permit. All agricultural operations are subject to the provisions of the Clean Streams Law. Generally speaking, activities on agricultural operations that could result in pollution are only allowed if best management practices are implemented to comply with water quality protection standards. Agricultural activities that cause accelerated soil erosion from areas such as fields and stream banks that pollute surface or groundwater could result in enforcement actions. This risk of an enforcement action is greatest when pollution from field erosion and sedimentation begins during conditions less than 10 year/24 hour storm events or impairs designated water uses.

The Clean Streams Law also provides that a complete and fully implemented Conservation Plan can protect farmers from penalties related to sediment pollution resulting from agricultural activities included in the plan.

**DEP Regulations on Erosion and Sedimentation Control** (25 Pa. Code § 102.4) – This regulation applies to all agricultural operations that conduct plowing and tilling, as well as other activities that disturb the surface of the land.

a. Agricultural plowing or tilling (§102.4a)

1. *BMPs*

a) Must minimize the potential for accelerated erosion and sedimentation<sup>15</sup> that would result in pollution during conditions up to and including 10 year/ 24 hour storm events or violate water quality standards<sup>16</sup>

b) Landowner, lessee, renter, tenant and other occupiers who conduct plowing or tilling are all responsible for implementing the required BMPs

2. *Written E&S plan*

a) Required if plowing or tilling (includes no-till farming) > 5,000 square feet

b) Must be designed to minimize the potential for accelerated erosion and sedimentation for plowing or tilling

c) A farm conservation plan meets this requirement for plowing and tilling when it includes<sup>17</sup>

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<sup>15</sup> Accelerated erosion and sedimentation is anything greater than natural loss up to and including a 10 year/24 hour storm event . In Pennsylvania, depending on your location, this can range from 3.6” to 5.0” of rainfall. County specific data is available in DEP’s Erosion and Sediment Pollution Control Manual or from your local county conservation district office.

<sup>16</sup> The requirement is to prevent loss of sediment to surface waters.

<sup>17</sup> Will be defined in terms of NRCS standards – Jana M. to obtain an NRCS 1991 plan, as referenced in the regulation, as well as a current plan

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- i. conservation practices<sup>18</sup> necessary to protect water quality from accelerated E&S, and
    - ii. meets “T”<sup>19</sup> across the crop rotation for plowed or tilled fields
  - d) Landowner, lessee, renter, tenant and other occupiers who conduct plowing or tilling are all responsible for making sure a plan exists for the operation
  - e) E&S plan shall contain
    - i. Plan maps
    - ii. Soil maps
    - iii. Surface waters (e.g., streams on the property)
    - iv. Drainage patterns (e.g., indication of the direction of sheet flow and location of flow concentrations, such as gullies or swales)
    - v. Description of BMPs
      - A. Tillage systems (e.g., no-till, contour strips)
      - B. Schedules (e.g. crop rotations and associated BMPs)
      - C. Cost effective and technically practical conservation measures (e.g. grassed waterways)
  - f) E&S plan shall be available at farm
- b. Construction: Obtain permits as required in §102.5 for earth disturbances over 1 acre (e.g., buildings, road construction)

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<sup>18</sup> acceptable practices are described in the *Pa Tech Guide*

<sup>19</sup> T (soil loss tolerance) is the maximum level of soil erosion that allows high levels of sustainable economic crop activity.

## **Baseline Compliance Measures Nutrient Management and Erosion & Sediment Control for Agricultural Operations in Pennsylvania**

All farms in Pennsylvania are subject to basic requirements for managing nutrients and providing erosion and sediment (E&S) controls. Details are contained in Sections 91.36 and 102.4 of DEP's regulations. Additional requirements apply to Concentrated Animal Operations (CAOs) – Act 38 and Chapter 83 and Concentrated Animal Feeding Operations (CAFOs) – Chapter 92. The basic requirement of the Clean Streams Law is to prevent manure nutrient (nitrogen and phosphorus) and sediment runoff from causing surface or groundwater pollution.

**Farmers, with a basic understanding of the requirements, can apply their practical experience and good judgment, using the guidance documents listed below, to accomplish compliance. When the practices implemented on a farm are not sufficient to protect water quality additional actions need to be taken to correct these problems. County conservation districts and others can provide assistance, including information about financial and technical support.**

Farmers may require technical assistance to accomplish compliance. If assistance is needed, they should contact the local county conservation district or other agricultural assistance organizations. Some may require approvals by the county conservation district, and some may also require a permit by DEP. CAOs are regulated by the State Conservation Commission under Chapter 83, and CAFOs regulated by DEP under Section 92.5a.

### **1. Summary of Water Quality Protection Requirements for Agricultural Operations**

All farms are required to have and implement current, written plans describing their operations, and their manure management and E&S control practices. Plan implementation records need to be maintained. The government generally does not review or approve these plans, except for CAOs and CAFOs. Nor does it conduct regular inspections of non-CAO/CAFO agricultural operations. However, the law requires compliance with these baseline measures for nutrient management and E&S control.

- Manure storages
  - o Properly designed, installed, operated and maintained to prevent leaks and spills (up to 25 year/24 hour storm event which can range from 4.1” to 5.8” in Pennsylvania depending on location)

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- DEP permit needed, unless DEP's *Manure Management Manual* practices and NRCS's *Pa. Tech Guide* installation and operation standards are implemented or as required by regulation
- For liquid and semi-solid manure storage
  - Professional Engineer certification that applicable NRCS standards met, or DEP permit/approval needed (some larger storages will always require a permit per the regulations)
  - Adequate freeboard must always maintained to minimize the risk of overflow even during extreme storm events
- DEP permit needed for new or expanded liquid and semi-solid manure storage after 10/22/2005 if:
  - Pond > 1 million gallons and in watersheds of HQ/EV streams or agricultural nutrient impaired stream segments
  - Any facility > 2.5 million gallons
- Land application of manure
  - DEP permit needed, unless current written nutrient management plan, including crops, fields and pastures, and records are implemented, maintained and available as required by DEPs *Manure Management Manual*
  - proper application rates for nitrogen and phosphorus based crop needs and water quality protection
  - Standards and practices described in DEP's *Manure Management Manual* and Penn State *Agronomy Guide* are recommended
  - CAOs, CAFOs and operations that import their manure are subject to additional requirements under the Act 38 of 2005, Chapter 83 and, for CAFOs, permit requirements of Chapter 92
- Barnyards and Animal Concentration Areas
  - Properly designed, operated and maintained practices to protect water quality
- E&S Controls
  - BMPs are installed and maintained to minimize the potential for accelerated erosion and sedimentation (up to 10 year/24 hour storm event, which can range from 3.6 to 5.0 inches, depending on location) for crop fields and pastures
  - current written E&S plan implemented, maintained and available for plowing, or tilling that disturbs 5000 square feet or more (A current, implemented Conservation Plan that (1.) meets "T", as an average across the crop rotation, for plowing and tilling and (2.) protects water quality using E&S Control BMPs, is an option for satisfying this E&S plan requirement)
  - NRCS's *Conservation Catalog* is recommended for guidance. The NRCS *Pennsylvania Technical Guide* contains BMP standards which can be followed. If these practices do not prevent accelerated erosion, additional practices will be needed.

## 2.Guidance Documents



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- DEP Manure Management Manual for manure storage and land application practices – (give a web link)  
<http://www.dep.state.pa.us/eps/docs/cab200149b1126000/fldr200149e0051190/fldr200149e32221af/doc20026sb4948013/361-0300-001.pdf>  
<http://www.dep.state.pa.us/eps/docs/cab200149b1126000/fldr200149e0051190/fldr200149e32221af/doc20033fa5358002/361-0300-002.pdf>
- DEP Erosion and Sedimentation Pollution Control Manual for E&S practices and standards and county specific rainfall information (web link) (couldn't find it!)
- Penn State *Agronomy Guide* practices for land application of manure – (web link)  
<http://agguide.agronomy.psu.edu/cm/default.cfm>
- NRCS Conservation Catalog for guidelines for E & S and manure storage and land application guidelines (web link)  
<http://www.pa.nrcs.usda.gov/news/FTPPublications/conscatalog.pdf>
- *Pennsylvania Technical Guide* for agricultural water quality protection practices and standards (web link)  
<http://efotg.nrcs.usda.gov/treemenuFS.aspx?Fips=42027&MenuName=menuPA.zip>
  - o (list applicable standards)

### 3. Sources of Technical Assistance

- a. Conservation districts [www.pacd.org/](http://www.pacd.org/)
- b. Cooperative Extension [www.extension.psu.edu/](http://www.extension.psu.edu/)
- c. Certified Nutrient Management Specialists  
[http://panutrientmgmt.cas.psu.edu/pdf/cert\\_county\\_listing.pdf](http://panutrientmgmt.cas.psu.edu/pdf/cert_county_listing.pdf)
- d. , Certified Crop Advisors [http://www.agronomy.org/cca/search\\_cca.html](http://www.agronomy.org/cca/search_cca.html),  
other qualified consultants Phone book, newspapers
- e. Farm organizations
- f. SCC  
<http://www.agriculture.state.pa.us/agriculture/cwp/view.asp?a=3&q=127144>

### 4. Examples of Compliance Problems

The legal requirements will usually be satisfied if the baseline compliance measures are followed. However, every farm is different, so it is important to make sure that the measures are working.

**Here are some indicators that management practices are not working and additional measures are necessary:**

- Runoff or infiltration of pollutants (e.g., manure; sediment, milkhouse waste, silage leachate runoff, or water commingled with pollutants), to surface or groundwater during normal operation and expected weather conditions (up to 25 year/24 hour storm for nutrient management and up to 10 year/24 hour storm for in-field E&S and nutrient application)

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- *Examples:* visual observation of discharge; soil or manure runoff from the operation accumulating on stream beds and banks during conditions less than the design storm
- Uncontrolled flow of stormwater into or through manure storages or animal concentration areas.
  - *Example:* roofrunoff from barn flows into loafing or feeding area; muddy or nutrient laden runoff from loafing or feeding areas discharging to streams
- Condition, size or operation of manure storage system inadequate for properly planned nutrient management practices.
  - *Examples:* freeboard is less than the level required for the operation; facility appears unstable or is leaking/overflowing; unplanned stockpiling of manure in unprotected areas (other than emergencies)
- Nutrient applications in excess of crop needs
  - *Examples:* nutrients are not applied at agronomic rates; repeated unplanned applications of manure in locations that are convenient to access; records, manure testing and soil testing are not utilized to plan and conduct manure and fertilizer applications; planned crop yields consistently exceed actual production
- Manure application in restricted areas
  - *Example:* manure application adjacent to stream on frozen or snow covered ground, mechanical manure application in required setbacks or buffers for CAOs, CAFOs or their import sites.
- Inadequate E&S controls in crop fields
  - *Examples:* reoccurrence and growth of soil erosion channels in fields; muddy runoff from fields reaching streams during conditions less than 10 year/24 hour storm events; stream bank erosion as a result of near stream tillage; loss of streambank stability where vegetation is removed or prevented from becoming permanent as a result of practices on the farm
- Inadequate E&S controls for agricultural activities other than plowing and tilling
  - *Examples:* Accelerated erosion from exposed soil (i.e. gullies, animal concentration areas, barnyards) spilling into surfacewater during conditions less than 10 year/24 hour storm events; streambank erosion as a result of farm animal or equipment activity
- Administrative violations
  - *Examples:* Failure to develop, implement and maintain a current E&S plan; failure to develop, implement, maintain and keep records for a current nutrient management plan; failure to obtain or follow required permits