DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Clean Water

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TITLE: Soil Erosion and Sediment Control Manual for Agricultural Operations

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AUTHORITY: The Clean Streams Law (P.L. 1987, No. 394) (35 P.S. §§ 691.5 and 691.402) and the Erosion and Sediment Control regulations of the Department of Environmental Protection (Department), 25 Pa. Code § 102.4(a).

POLICY: Pennsylvania regulations for agriculture require that Best Management Practices (BMPs) be implemented to prevent accelerated erosion and sedimentation to waters of this Commonwealth from agricultural plowing or tilling activities or Animal Heavy Use Areas (AHUAs), including activities that disturb less than 5,000 square feet. When those activities total 5,000 square feet or greater, Pennsylvania regulations require the development and implementation of a written Agricultural Erosion and Sediment Control Plan (Ag E&S Plan) to minimize the potential for accelerated erosion and sedimentation. The Department's goal is to ensure that all agricultural operations in Pennsylvania have written Ag E&S Plans, where applicable, and that those plans are implemented. This document provides those involved with agricultural operations additional guidance when developing Ag E&S Plans.

PURPOSE: This guidance will further explain the requirements of an Ag E&S Plan under 25 Pa. Code § 102.4(a).

APPLICABILITY: This guidance applies to all agricultural operations that include plowing or tilling activities, including no-till, and AHUAs. This guidance does not apply to construction activities or to modification of structures or facilities associated with agricultural operations; refer to 25 Pa. Code § 102.4(b) for more information.

DISCLAIMER: The policies and procedures outlined in this guidance are intended to supplement existing requirements. Nothing in the policies or procedures shall affect regulatory requirements.

The policies and procedures herein are not an adjudication or a regulation. The Department does not intend to give this guidance that weight or deference. This document establishes the framework, within which the Department will exercise its administrative discretion in the future. The Department reserves the discretion to deviate from this policy statement if circumstances warrant.

PAGE LENGTH: 71 pages

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FOREWORD

All agricultural operations in Pennsylvania, regardless of size, are subject to The Clean Streams Law, which makes it unlawful to discharge pollutants to surface or groundwater unless authorized by the Pennsylvania Department of Environmental Protection (Department). All agricultural operations in Pennsylvania are required to minimize accelerated erosion and sedimentation to the waters of this Commonwealth, as sediment is considered a pollutant of water. The specific requirements for erosion and sediment control are contained in Chapter 102 of the Department's regulations. Agricultural operations that plow or till or have Animal Heavy Use Areas (AHUAs) must implement appropriate Best Management Practices (BMPs) to prevent accelerated erosion and sedimentation to waters of this Commonwealth. AHUAs are often referred to as Animal Concentration Areas (ACAs), particularly during manure and nutrient management planning. Those operations that plow or till 5,000 or more square feet, including no-till, or that have AHUAs that are 5,000 or more square feet in total, are required to have a written Agricultural Erosion and Sediment Control Plan (Ag E&S Plan).

A United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Conservation Plan is similar to an Ag E&S Plan; however, in an NRCS Conservation Plan, all resource concerns on an operation, including soil erosion, are evaluated. NRCS Conservation Plans contain conservation practices that address identified resource concerns such as soil erosion, water quality or inadequate habitat. An NRCS Conservation Plan may fulfill the requirement of an Ag E&S Plan, but the operator/landowner must specifically request this during their consultation with NRCS. Additionally, the Department is the regulatory authority that determines if the NRCS Conservation Plan satisfies the Department's regulatory requirements of an Ag E&S Plan.

Ag E&S Plans and NRCS Conservation Plans being used to fulfill the requirement of an Ag E&S Plan must be consistent with the current conditions and activities on the agricultural operation and must be available for review. If the provisions of the plan are currently being implemented on the operation, the plan is consistent with the operation's conditions and activities. Both the operator and landowner are jointly responsible for developing, implementing, and updating the plan.

This manual is divided into three distinct pieces:

- Part 1 – This section is for agricultural operators and landowners.
- Part 2 – This section is for Ag E&S Plan developers. If operators/landowners feel comfortable writing their own Ag E&S Plan after reading Part 1, they may continue to this section. It provides greater technical detail regarding how to write an Ag E&S Plan.
- Part 3 – This section contains the following:
    - Ag E&S Plan Administrative Completeness Review Guide – A one-page "checklist" to determine if the Ag E&S Plan contains all the required items.
    - Ag E&S Plan Instructions – The elements are divided into five sections, which are outlined in Part 1 and discussed in detail in Part 2.
    - Example Ag E&S Plan – A completed sample plan is provided for reference.
    - Ag E&S Plan Template – This may be used to record the Ag E&S Plan information.

DESCRIPTIONS OF TERMS USED IN THIS MANUAL

Note: The below terms are used throughout this manual. Some of these terms have definitions set forth in 25 Pa. Code § 102.1 (the "Regulatory Definitions"), an unofficial copy of which is included in Appendix A. The descriptions below are intended to assist in understanding how the Department interprets and applies the Regulatory Definitions in the context of this manual. These descriptions do not modify, replace, or supersede the Regulatory Definitions, and are provided for illustrative purposes only. In the event of a perceived discrepancy between the descriptions set forth below and the Regulatory Definitions, the Regulatory Definitions control.

Accelerated erosion – Removal of the surface of the land through the combined action of human activities and natural processes, at a rate greater than would occur because of the natural process alone.

Agricultural Erosion and Sediment Control Plan (Ag E&S Plan) – A site-specific plan consisting of both a map(s) and a narrative that identifies Best Management Practices (BMPs) to minimize accelerated erosion and sedimentation before, during, and after earth disturbance activities. Ag E&S Plans also must show that soil loss is, at a minimum, limited to the soil loss tolerance (T) over each planned crop rotation for all plowing and tilling activities, including no-till. These are not the same as Natural Resources Conservation Service (NRCS) Conservation Plans, as Ag E&S Plans only meet the requirements for Pennsylvania regulations and only address soil erosion concerns.

Agricultural operation – The management and use of farming resources for production of crops, livestock, or poultry, or for equine activity. Crops include, but are not limited to, vegetables, fruits, seeds, nuts, nursery crops, field crops, hay, pastures, and fields utilized for wildlife food plots. This also includes land used for crop research.

Agricultural plowing or tilling activity –

(i) Earth disturbance activity involving the preparation and maintenance of soil for crop production. Crops include, but are not limited to, vegetables, fruits, seeds, nuts, nursery crops, field crops, hay, pastures, and fields utilized for wildlife food plots. This also includes land used for crop research.

(ii) The term includes the use of conventional and minimum tillage tools in seedbed preparation prior to planting, as well as cultivation during the growing season.

(iii) The term includes no-till cropping methods, the practice of planting crops directly into existing crop residue or cover crops with no mechanical tillage prior to planting, and where minimal soil disturbance is limited to narrow bands that are not full row-width next to the seed row.

Animal Heavy Use Areas (AHUAs) and Animal Concentration Areas (ACAs) –

(i) Barnyard, feedlot, loafing area, exercise lot or other similar area on an agricultural operation where, due to the concentration of animals, it is not possible to establish and maintain vegetative cover of a density capable of minimizing accelerated erosion and sedimentation by usual planting methods.

(ii) The term does not include entrances, pathways, and walkways between areas where animals are housed or kept in concentration.

To further clarify, any temporary confinement areas, such as areas for winter feeding that are vegetated most of the year, are considered seasonal AHUAs. The term AHUA is most commonly used when referring to erosion and sedimentation, while the term ACA is most commonly used when referring to nutrient management.

(iii) ***Earthen AHUAs*** – Any AHUA, as defined above, that does not have a stabilized, scrapable, non-eroding surface.

Best Management Practices (BMPs) – Activities, facilities, measures, planning, or procedures used to minimize accelerated erosion and sedimentation and manage stormwater to protect, maintain, reclaim, and restore the quality of waters and the existing and designated uses of waters within this Commonwealth before, during, and after earth disturbance activities. BMPs can be divided into two types:

(i) ***Management BMPs*** – Any BMP, as defined above, that is a practice or procedural change on the operation. Examples include, but are not limited to, cover cropping, contour farming, prescribed grazing, and conservation tillage, which includes practices such as mulch-tillage and strip-tillage.

(ii) ***Structural BMPs*** – Any BMP, as defined above, that is physically installed or constructed. These can be natural/living or artificial structures and are typically permanent. Examples include, but are not limited to, stream crossings, heavy use area protection, terraces, and diversions.

Channel – A natural or man-made water conveyance.

Conservation district – A conservation district, as defined in section 3(c) of the Conservation District Law (3 P.S. § 851(c)), which has the authority under a delegation agreement executed with the Department to administer and enforce all or a portion of the erosion, sediment, and stormwater management program in this Commonwealth.

Conservation practice – A structure, vegetation or management technique used to address specific resource concerns. Conservation practices, with corresponding NRCS standards and specifications, are contained in the *PA NRCS Field Office Technical Guide*, Section IV.

Disturbed area – Unstabilized land area where an earth disturbance activity is occurring or has occurred.

Earth disturbance activity – Activity which disturbs the surface of the land, including agricultural plowing or tilling, operation of AHUAs, and the moving, depositing, stockpiling, or storing of soil, rock, or earth materials.

Erosion – The natural process by which the surface of the land is worn away by water, wind, or chemical action. Specific types of erosion include:

(i) ***Ephemeral gully erosion*** – The removal of soil within concentrated flow areas by surface water runoff that creates an ephemeral gully. Ephemeral gullies are usually, but not always, corrected by tillage but reoccur in the same locations; often referred to as seasonal gullies. Ephemeral gullies are typically larger than a rill and smaller than a gully and are not included or identified in the water erosion prediction technologies.

(ii) ***Gully erosion*** – The removal of soil within concentrated flow areas by surface water runoff that creates a gully. Gullies are usually around one foot or greater in depth and cannot be corrected by tillage. Gullies are not included in the water erosion prediction technologies.

(iii) ***Rill erosion*** – The removal of soil in small, isolated concentrated flow areas, typically in the same field, by surface water runoff that creates a rill. Rills are usually less than four inches deep but typically about one inch in depth and width and, if not addressed, may worsen and form gullies.

(iv) ***Sheet erosion*** – The removal of soil evenly across a slope by rain splash and its transport by shallow surface flow occurring upslope from areas where surface runoff accumulates into a concentrated flow; also referred to as "interrill erosion".

Intermittent stream – A body of water in a well-defined channel that typically has flowing water during various times of the year; sometimes referred to as a seasonal stream.

NRCS Conservation Plan – These plans evaluate all resource concerns, including soil erosion, water quality, and inadequate habitat, and identify conservation practices that treat the resource concerns. An NRCS Conservation Plan *may* fulfill requirements for an Ag E&S Plan if it meets all the requirements of 25 Pa. Code § 102.4(a), as requested by the operator/landowner; however, this determination is made by the Department. These plans may be more comprehensive than an Ag E&S Plan and are required for participation with United States Department of Agriculture (USDA) programs. NRCS Conservation Plans must meet all USDA-NRCS planning requirements and be signed by an individual with current NRCS Certified Conservation Planner designation.

Perennial stream – A body of water in a well-defined channel that typically has continuously flowing water throughout the year.

Predicted average annual soil loss (A) – An estimate of the average soil loss, in tons/acre/year, in runoff from specific field areas under specified cropping and management systems. This can be found using several water erosion prediction technologies.

Resource concern – NRCS terminology referring to an expected degradation of the soil, water, air, plant, or animal resource base to the extent that the sustainability or intended use of the resource is impaired. Sheet, rill, and gully erosion are examples of resource concerns.

Sediment – Soils or other erodible materials transported by stormwater as a product of erosion.

Sedimentation – The action or process of forming or depositing sediment in waters of this Commonwealth.

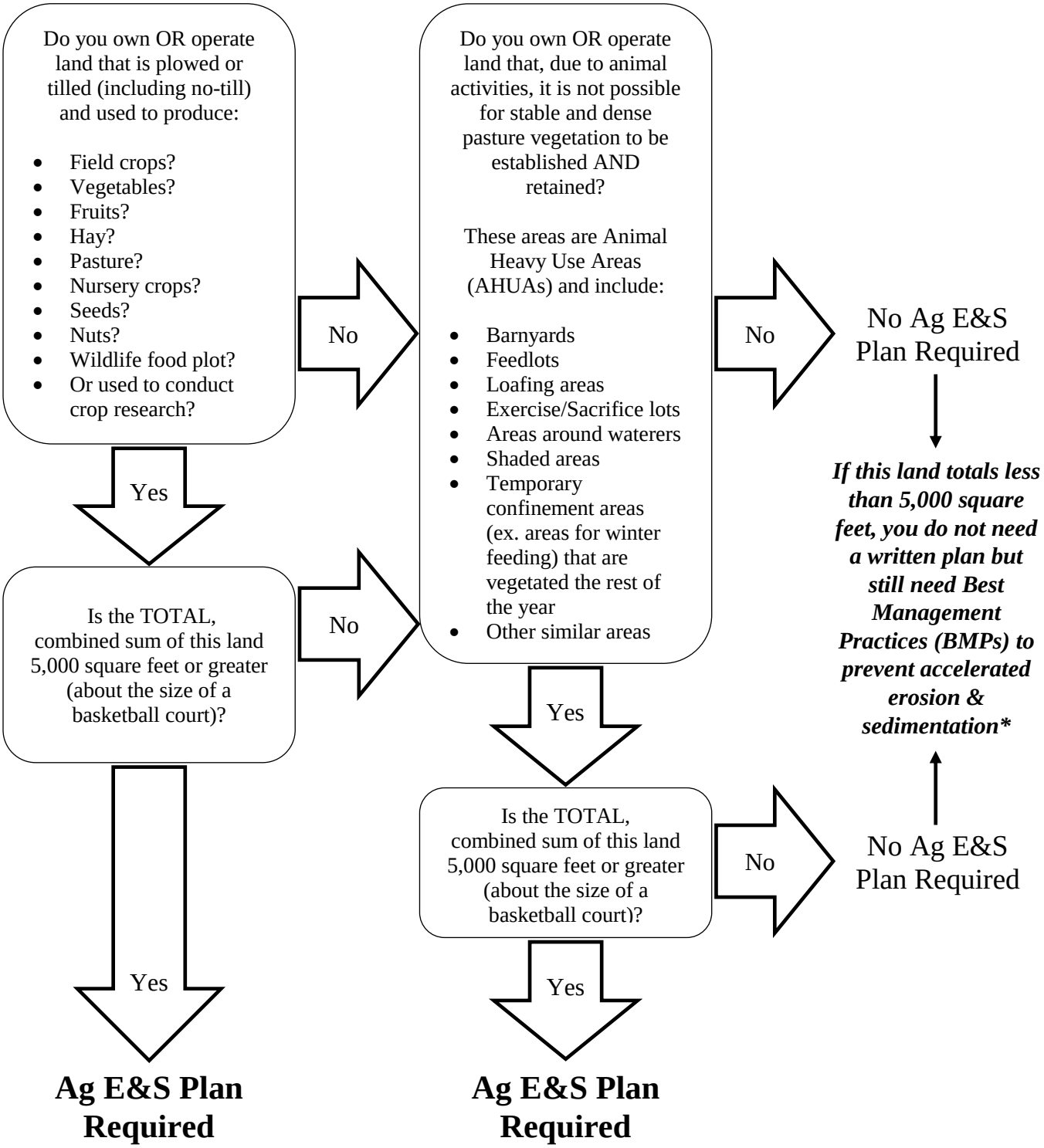
Soil loss tolerance (T) – The maximum amount of soil loss, in tons/acre/year, that a given soil type can tolerate and still permit a high level of crop production to be sustained economically and indefinitely.

Stabilization – The proper placing, grading, constructing, reinforcing, lining, and covering of soil, rock, or earth to ensure their resistance to erosion, sliding or other movement.

Surface waters of this Commonwealth – Perennial and intermittent streams, rivers, lakes, reservoirs, ponds, wetlands, springs, natural seeps, estuaries, and channels of conveyance of surface water, or parts thereof, whether natural or artificial, within or on the boundaries of this Commonwealth.

PART 1 – MANUAL FOR OPERATORS AND LANDOWNERS
STEP 1 – GETTING STARTED

DO I NEED AN AGRICULTURAL EROSION AND SEDIMENT CONTROL PLAN (AG E&S PLAN)?



* Pages 14 – 16 contain some common BMPs that you may want to consider for your operation.

WHY ARE ALL AGRICULTURAL OPERATIONS REQUIRED TO HAVE BMPs?

As stated on the previous page, BMPs are needed to prevent accelerated erosion and sedimentation on all agricultural operations, regardless of the size, to comply with regulations.

BMPs also provide great benefits to your operation*, including*:

- **Fields retain valuable topsoil**
- **Reduced costs associated with: fertilizer, fuel, equipment (including maintenance costs), and labor**
- **Improved safety and health of livestock by reducing risk of injuries and diseases, providing cleaner drinking water, and providing a higher quality and quantity of forage**
- **Increased soil fertility, crop growth, and productivity**
- **Improved soil capacity to withstand heavy farm equipment, resulting in less compaction**
- **Help control weeds and pests**
- **Prevent erosion issues such as gullies, which can be costly and time-consuming to repair and may damage equipment**
- **Prevent flood damage**
- **Increased water infiltration and retention**
- **Maintain soil health and productivity for future generations**

WHAT IF I ALREADY HAVE AN AG E&S PLAN OR CONSERVATION PLAN?

Ag E&S Plans and Conservation Plans need to be revised if any of the following occur:

- **There is a new operator or landowner**
- **Land is added to the operation**
- **There is planned construction of additional buildings, a homestead, a subdivision, or animal housing, including buildings that are being constructed as a replacement for existing structures in the same footprint and the site conditions (such as the grade and contour of the site) have changed**

  A Construction E&S Plan is also required; please refer to Appendix C
- **More aggressive tillage practices than those listed in the plan are used**
- **New crop rotations are planned, or existing rotations are changed**
- **New BMPs are planned**
- **New AHUAs are planned or have formed on the operation**
- **BMP implementation schedule has changed**
- **Rill erosion and/or gully erosion develops**
- **The Ag E&S Plan contains information that is not consistent with the operation's Manure Management Plan (MMP) or Nutrient Management Plan (NMP)**
- **The soil information is outdated, the soil loss tolerance (T) values have decreased or the plan is missing proof (i.e., soil loss calculations) that the predicted average annual soil loss (A) values are less than or equal to T**
- **Any changes not listed above that will alter the agricultural operation, plowing/tilling activities or AHUAs, etc.**

Note: If your Ag E&S Plan needs to be revised for any of these reasons, you need to review the most current soil information for your operation. If it has been updated since the date of your last plan development or update, you will need to revise the soil information (including maps), T values, A values, and develop/implement BMPs to meet T, as necessary.

This is not an all-inclusive list. Every operation has site-specific conditions to consider.

COULD I WRITE MY OWN PLAN?

*If you answer **"NO"** or **"I DON'T KNOW/I'M UNSURE"** to any of the following questions, please **STOP** and contact your local county conservation district and/or a commercial planner to write a plan for you. You may also contact the Natural Resources Conservation Service (NRCS) if you would like to have all resource concerns on your operation evaluated and are willing to use conservation practices to address those concerns.*

1. **Are you able to describe rill and gully erosion and visually identify rills and gullies?**
2. **Is every one of your fields free of rills and gullies all year?**
3. **Are you aware that you may be losing topsoil even if you do not notice rills and/or gullies in any of your fields?**
4. **Do you know how to measure the slopes of your fields?**
5. **Do all your fields have slopes that are 8% or less?**
6. **Are you able to understand the information contained in soil and topographic maps?**
7. **Are you familiar with common practices used to prevent accelerated erosion and sedimentation?**
8. **Are you aware that animal traffic/animal congregation can cause erosion?**
9. **Are you aware that accelerated erosion and sedimentation on your operation can harm water quality and is against Pennsylvania law?**

STEP 2 – EVALUATE YOUR OPERATION

SELF-ASSESSMENT: COMMON ISSUES

*If you answer **"YES"** to any of these questions, **you will need to address those items** in your Ag E&S Plan and **you may need to make changes** on your operation. It is recommended that you contact your local county conservation district and/or a commercial planner for help if you answer **"YES"** to any of the following questions or for help in answering these questions.*

You should physically walk your fields and operation when performing the evaluation.

Note: *This is not an all-inclusive list. Every operation has site-specific conditions to consider.*

1. **Are any fields within 100 feet of a river or stream?**
2. **Are there signs that sediment may be leaving crop fields and/or bare ground areas?**
3. **Are there signs that sediment is leaving crop fields and/or bare ground areas and reaching surface water (stream, waterway, lake, pond, or open sinkhole)?**
4. **Do you perform medium to heavy tillage at any point in the crop rotation?**
5. **If you use crop rotations, do any rotations consist only of erosion-susceptible crops such as corn or soybeans?**
6. **Are there areas of bare soil due to heavy livestock use that result in the removal of vegetation or streambank damage?**
7. **Does rainwater, roof runoff water, and other clean stormwater flow through the barnyard, farmstead, AHUAs, etc., and may be washing away sediment?**
8. **Are there any field lanes or animal pathways on the operation where stormwater runoff may be washing away sediment?**
9. **Are there any areas on the operation where erosion is causing the formation of rills and/or gullies?**
10. **Are any BMPs becoming less effective than when they were installed? If you received funds for installing a BMP, are you maintaining it as you agreed?**

If you need help evaluating all resource concerns on your operation, including soil erosion, and are willing to use one or more conservation practices to address those concerns, you may want to contact NRCS.

STEP 3 – ADDRESSING ITEMS IN YOUR AG E&S PLAN

SUMMARY OF ITEMS

Note: This manual divides the items found in your Ag E&S Plan into five sections for the purposes of organization and discussion. Following this format is recommended but not required.

Section 1: General Information – You may include information for the operator, landowner, and Ag E&S Plan preparer as well as the date of plan development in this section.

Operation Information: Crop rotations, tillage/planting methods, location, description, acreage

Soil Information: Can be provided on a map or in a tabular form

Map(s) of Owned and Rented Lands; Must Identify:

- Surface waters
- Buildings/structures
- Existing and proposed structural BMPs
- Roads/crossroads
- Soil types (if not provided elsewhere)
- AHUAs
- Field/property boundaries
- Topographic features (relief/elevations, natural, and man-made)

Section 2: Soil Loss

Show that the average predicted soil loss is less than or equal to the soil loss tolerance (T) for each crop rotation on each crop field for all plowing/tilling (including no-till); may require BMPs

Section 3: Cropland, Hayland, and Pasture BMPs

Section 4: Fields Along Streams and Rivers

Section 5: Animal Heavy Use Areas

These three sections contain BMPs that will be used or are being used to minimize/reduce accelerated erosion and sedimentation.

BMPs Are Needed for the Following:

- Cropland, hayland, and pastures where plowing and tilling (including no-till) takes place
- Earthen AHUAs (those without a stabilized, scrapable, non-eroding surface)
- Fields along streams and rivers where plowing and tilling activities (including no-till) take place on fields with less than 25% plant/crop residue cover AND within 100' of a river/stream need additional and suitable BMPs
- Meeting T
- To address any items found during your self-assessment
- ANY gully erosion, including ephemeral, or rill erosion on operation
    - If you see ANY gullies or rills, you should STOP and contact your local county conservation district, NRCS, and/or a commercial planner for help.

All BMPs Must Have:

- Descriptions (for existing and proposed)
- Operation and maintenance (O&M) standards
- Acceptable and reasonable schedule for carrying out proposed BMPs and/or dates existing BMPs were implemented

Additionally, Your Ag E&S Plan Must:

- Agree with your current Nutrient Management Plan (NMP) or Manure Management Plan (MMP)
- Reflect existing and proposed conditions and activities on your operation

Section 1: General Information

You may include the operator, landowner, and Ag E&S Plan preparer information and the date of plan development near the beginning of this section. You must include your crop rotations, tillage, and planting methods, operation details, soil information (see page 37 for an example of what to include for soil information), and a map(s) of the owned and rented lands.

These maps must identify:

- Field and property boundaries
- Buildings and farm structures
- Surface waters of this Commonwealth
- Soil maps indicating the types and boundaries of soils (if this information is not provided elsewhere in the plan)
- Roads and crossroads
- AHUAs
- Structural BMPs, existing and proposed
- Topography; includes contour lines that show elevation/hills/valleys/etc., water features, and man-made features

It is strongly recommended to include field identifiers and acreages on the map(s); see page 22 for an example of an operation's mapped fields.

This information can be obtained using the PAOneStop Farm Mapping and E&S Planning System. Soil maps can also be obtained using the Pennsylvania Soil Survey. You may use map(s) found in your NMP or MMP if all the required information above is provided. Aerial maps are highly recommended.

Pages 35, 36, and 38 show examples of operation, soil, and topographic maps.

Section 2: Soil Loss

In addition to the soil map(s) and soil information provided in Section 1, above, the following information regarding soil and soil loss is required in your Ag E&S Plan:

- Show that the soil loss for each field, and every planned crop rotation in each field, will not exceed T for the soil type that makes up most of the field over the planned crop rotation. Soil loss tolerances, shown as tons per acre per year (tons/acre/year) over the crop rotation, are the maximum levels of soil erosion that allow high levels of sustainable economic crop productivity while limiting the risk of accelerated erosion.

- Both the soil type and each related soil T value for your operation can be found in the Pennsylvania Soil Survey or PAOneStop. Official soil data is updated at times by NRCS, so the most current data and soil maps must be used. If the Pennsylvania Soil Survey or PAOneStop is not used to obtain this information, you must make sure the data is current and provide the source used.

  Note: If the most updated soil data is not used, the T values may have changed. If any of the T values have decreased, your plan will not be acceptable and will need to be revised (see page 7).

- Predicted average annual soil loss (A) is found using the Water Erosion Prediction Project (WEPP), the Revised Universal Soil Loss Equation (RUSLE/RUSLE2), an official NRCS-developed water erosion prediction technology, PAOneStop or another method approved by the Pennsylvania Department of Environmental Protection (Department). Calculations and/or printouts of reports must be included for all methods used.

    - If the predicted soil loss is found to exceed the soil loss tolerance, you will need to use additional BMPs to meet T and include those BMPs in Section 3.

    - Evaluate crop residues. Cover crops should be used if residues are removed.

    - If you see gully erosion, including ephemeral (seasonal) gullies, OR rill erosion on your operation, you should **STOP** and contact your local county conservation district, NRCS, and/or a commercial planner, as accelerated erosion is already occurring.

- If you need help finding the soil loss tolerance and/or predicted average annual soil loss for your fields, please contact your local county conservation district and/or a commercial planner. You may want to contact NRCS if you need help evaluating all resource concerns on your operation, including soil erosion, and are willing to use one or more conservation practices to address those concerns. Soil loss calculations will be provided with the NRCS Conservation Plan.

- Appendix B contains guidance when creating a plan without professional aid. It lists some specific crop rotations and slope scenarios that will minimize erosion. It has been found that these scenarios will meet T values of three, four, or five tons/acre/year when used. If your operation has fields that meet these criteria without any type of gully or rill erosion, AND crop residues are not removed, AND you did not find any issues when you evaluated those fields, you do not need to calculate the soil loss for those fields and may instead rely on the applicable chart(s).

Section 3: Cropland, Hayland, and Pasture BMPs

Section 4: Fields Along Streams and Rivers

Section 5: Animal Heavy Use Areas

These three sections contain BMPs that will be used or are being used to minimize/reduce accelerated erosion and sedimentation.

Once you have evaluated your operation for items and areas that need to be addressed (see page 9), you need to decide what BMPs you will use to minimize erosion. These can be either structural (e.g., diversions, terraces, roof runoff structures, fencing) or management (e.g., conservation crop rotations, no-till, contour farming, strip-cropping, cover crops). Per Chapter 102 regulations, BMPs and their design standards are listed in the current amended and updated version of the appropriate NRCS conservation practice standards, which can be found in the *PA NRCS Field Office Technical Guide*, Section IV. You may contact your local county conservation district, NRCS, and/or a commercial planner for additional help.

- <u>BMPs are needed for</u>:

    - Earthen AHUAs – Any AHUAs that do not have a stabilized, scrapable, non-eroding surface. Contact the Department, your local county conservation district or NRCS if you need help determining if your AHUA(s) has a stabilized surface. Any seasonal earthen AHUAs also need BMPs.

- All fields/pastures where plowing and tilling activities (including no-till) occur.
- Any gully erosion, including ephemeral (seasonal) gullies, or rill erosion.
- Issues found during your self-assessment/evaluation of your fields and operation.
- Meeting T.

  Note: Existing BMPs that are needed for meeting T must be maintained the entire time they are used or replaced with different BMPs that also meet T.

- For plowing and tilling activities on fields with less than 25% plant or crop residue cover and within 100 feet of a river or stream (perennial or intermittent), you need additional and suitable BMPs to minimize accelerated erosion and sedimentation. For help finding the percentage of residue in your field(s), refer to the NRCS brochure *Farming with Crop Residues* (see Appendix D). Section 4 in Part 3 (page 31) provides more detail on specific practices.

- The following information must be included in your plan:
  - BMPs with descriptions for both those that are existing and those proposed; any temporary BMPs should be identified as such in your plan.
  - AHUA practices and procedures, including descriptions of each AHUA.
    - Examples include BMPs to divert off-site surface water and to stabilize the surface.
    - Seasonal BMPs should include a plan to reseed each year.
  - O&M criteria/standards for existing and proposed BMPs.
  - Schedules for applying proposed BMPs and/or dates existing BMPs were implemented.
    - Must contain an acceptable BMP implementation schedule; implementing BMPs within three years of the Ag E&S Plan development is recommended.
    - Visible sediment pollution that can be seen entering or is suspected of entering any surface water needs to be addressed immediately; contact your local conservation district, NRCS, and/or a commercial planner for help.
    - BMPs must be implemented according to the schedule in the plan.

See page 30 for two examples of the information that is required to be included in your Ag E&S Plan for BMPs, including the descriptions, O&M information, and implementation schedules. Some common BMPs are listed on the following three pages with descriptions and some of the benefits they provide. Please note that these are not all-inclusive lists; every operation has specific conditions to consider and there could be other BMPs that are better suited for your operation. There may be other benefits of these practices in addition to what is listed. You may contact your local county conservation district, NRCS, and/or a commercial planner for additional help.

Common BMPs for <u>Both</u> Livestock/AHUAs and Fields

	Description	Benefits
Critical Area Planting	Establishing permanent vegetation on sites that have, or are expected to have, high erosion rates, and on sites that have physical, chemical, or biological conditions that prevent the establishment of vegetation with normal seeding/planting methods.	Improves water quality; Reduces maintenance costs; Enhances wildlife habitat
Diversion	A channel generally constructed across the slope with a supporting ridge on the lower side; used to divert surface water away from farmsteads, waste systems, etc. Establishment and maintenance of permanent stabilization (usually grass) is required.	Improves: water quality, water absorption; Reduces runoff to structures below; Allows better crop growth on bottom land soils
Filter Strip	A strip or area of herbaceous vegetation that removes contaminants from overland flow.	Improves: water quality, wildlife habitat; Reduces suspended solids and associated contaminants in irrigation tailwater
Grassed Waterway	A shaped or graded channel that is established with suitable vegetation to convey surface water at a non-erosive velocity using a broad and shallow cross-section to a stable outlet. Used to prevent gully formation and convey runoff from terraces and diversions.	Prevents: gullies, flood damage; Improves water quality; Provides wildlife habitat; Absorbs pesticides and nutrients in runoff
Riparian Forested Buffer	Establishing area of trees and/or shrubs adjacent to and up-gradient from streams, ponds, and wetlands.	Protects: fields from flooding, aquatic environment; Improves riparian habitat for wildlife; Reduces streambank erosion; Creates shade to lower water temperatures; Increases biodiversity
Terrace	An earth embankment or a combination ridge and channel constructed across the field slope. Used to intercept runoff water and usually outlet to waterways or diversions.	Improves: infiltration, water distribution; Prevents: flooding, gullies; Retains runoff for moisture conservation; Assists vegetation establishment

Common BMPs for Fields

	Description	Benefits
Conservation Cover	Establishing and maintaining permanent, perennial vegetative cover.	Maintains/improves soil health; Reduces ground and surface water degradation; Enhances wildlife habitat
Conservation Crop Rotation	A planned sequence of crops grown on the same ground over a period of time (i.e., the rotation cycle).	Improves: soil nutrient balance, soil health, crop yields; Reduces costs associated with pesticides and fertilizer
Contour Buffer Strips	Narrow strips of permanent, herbaceous vegetative cover established around the hill slope, and alternated down the slope with wider cropped strips that are farmed on the contour (perpendicular to the slope).	Increases: water infiltration, habitat cover for wildlife; Reduces transport of sediment and other water-borne contaminants downslope
Contour Farming	Aligning ridges, furrows, and roughness formed by tillage, planting, and other operations at a grade near the contour to alter the velocity or the direction of water flow.	Improves water quality; Reduces fuel consumption which lowers production costs; Less strain on farming equipment; Increases moisture absorption into the soil
Cover Crops	Crops, including grasses, legumes, and forbs, grown to provide seasonal vegetative cover.	Improves: water quality, nutrient management options, soil structure, soil porosity; Reduces: nutrient loss following primary crop harvest, soil compaction, potential for weeds; Increases soil organic matter; May lower production costs due to the need for less fertilizer
Forage Harvest Management	The timely cutting and removal of forages from the field as hay, green-chop or ensilage.	Improves water infiltration; Optimizes yield and quality of forage; Promotes vigorous plant regrowth; Manages pests
No-Till	Limiting soil disturbance to manage the amount, orientation, and distribution of crop and plant residue on the soil surface year-round by planting crops directly into existing crop residue or cover crops; no mechanical tillage prior to planting and no full-width tillage equipment is used.	Reduces: costs of labor/equipment/fuel, soil compaction; Maintains/increases soil health and organic matter content; Increases moisture available to plants
Reduced Tillage	Managing the amount, orientation, and distribution of crop and other plant residue on the soil surface year-round while limiting soil-disturbing activities used to grow and harvest crops in systems where the field surface is tilled prior to planting.	Reduces: costs, energy use, particulate emissions; Maintains/improves soil health; Increases water holding capacity; Conserves soil moisture; Keeps nutrients and pesticides on the fields
Riparian Herbaceous Cover	Grasses, sedges, rushes, ferns, legumes, and forbs tolerant of intermittent flooding or saturated soils, established or managed as the dominant vegetation in the transitional zone between upland and aquatic habitats.	Increases: water storage on floodplains, carbon storage in the biomass/soil; Improves water quality; Enhances habitat for pollinators; Dissipates stream energy and traps sediment
Strip-cropping	Growing planned rotations of erosion-resistant and erosion-susceptible crops or fallow in a systematic arrangement of strips across a field.	Improves: water and air quality; Reduces water runoff; May reduce costs for fertilizer if the crop strips are alternated with legumes such as clover or alfalfa

Common BMPs for Livestock/AHUAs

	Description	Benefits
Fence	A constructed barrier to animals or people installed along a stream or riparian area.	Improves: water quality, health of livestock by reducing contact with potential waterborne bacteria; Reduces risk of injury to livestock; Stabilizes stream banks; Provides habitat for wildlife
Heavy Use Area Protection	Stabilize ground surface that is frequently and intensively used by people, animals, or vehicles by establishing vegetative cover, by surfacing with suitable materials, and/or by installing needed structures. The surface must be non-eroding.	Improves appearance; Provides safe and stable access to these frequently used areas; Reduces equipment maintenance; Keeps livestock cleaner and healthier; Easier to scrape manure
Prescribed Grazing	Managing the harvest of vegetation with grazing and/or browsing animals with the intent to achieve specific ecological, economic, and management objectives.	Improves: quantity and quality of forages, animal health and productivity, water quality and quantity, soil condition, food and cover for wildlife; Increases profits from reduced feed costs
Roof Runoff Structure	A structure that will collect, control, and convey precipitation runoff from a roof (e.g., gutters and downspouts).	Reduces likelihood of the building flooding; Protects buildings from undercutting the foundation; Prevents stormwater from flowing into livestock shelters; Collects runoff for livestock and irrigation use
Stream Crossing	A stabilized area or structure constructed across a stream to provide controlled access for people, livestock, equipment, or vehicles.	Improves: water quality, livestock health by reducing contact with potential waterborne bacteria; Reduces risk of injury to livestock
Vegetated Treatment Area	An area of permanent vegetation used for agricultural wastewater treatment. Vegetated treatment areas can be constructed, operated, and maintained to treat contaminated runoff from such areas as feedlots, compost areas, barnyards, and other livestock holding areas; or to process wastewater.	Improves: water quality, habitat for wildlife; Treats the runoff of nutrients

Additionally, Your Ag E&S Plan Must:

- Be consistent with the information in your operation's current NMP or MMP.
    - The existing and proposed BMP descriptions, AHUA practices and procedures, tillage systems, BMP schedules, and crop rotations should be reflected in your NMP or MMP.
- Reflect both existing and proposed conditions and activities on your operation, including surface waters, drainage patterns, and field boundaries.
    - Your plan is not compatible with your current operation if it needs to be updated (see page 7).

Other Important Information:

- Both the operator and landowner are jointly responsible for developing, implementing, and updating an Ag E&S Plan for the agricultural operation, so those parties will need to determine who will develop the plan and provide the other party a copy of the plan.
- Both the operator and landowner should have the plans available for review and inspection.
- An NRCS Conservation Plan may serve as your Ag E&S Plan if it meets all the requirements of 25 Pa. Code § 102.4(a), and you request this from your NRCS Certified Conservation Planner; however, the determination of meeting regulatory requirements is made by the Department. If you have an NRCS Conservation Plan, you may ask the Department to determine if your plan satisfies the requirements of 25 Pa. Code § 102.4(a).
- If animals consistently congregate in any earthen entrance, pathway or walkway on the operation, these areas are considered AHUAs and should be addressed in your Ag E&S Plan.
- Hayland and permanent pastures:
    - These areas may eventually need to be reseeded and tilled (including no-till), which is why they would require an Ag E&S Plan. If these are the only lands on your operation that require an Ag E&S Plan, you do not plan on reseeding for several years, and no other earth disturbance activity in the fields is planned, you can wait to develop an Ag E&S Plan that addresses these fields until closer to, but before, the scheduled reseeding date.
- Pastures and overgrazing:
    - A pasture does not have to be bare to be considered overgrazed.
    - Signs of overgrazing *may* include:
        - Overall stunted plants
        - Increased space between individual plants
        - Clumps of denser vegetation throughout the pasture
        - Dominance of low-quality plants

        - And, depending on the types and quality of plants, overall very even plant height that is below three inches OR very spotty areas of taller, less-desirable vegetation

- Horse riding arenas/rings:

    - These are treated the same as any other AHUA. Riding areas that have a combined sum of 5,000 square feet or greater on an operation and:

        - Do not have a stabilized, non-eroding surface, (e.g., an earthen or dirt lot), are required to be addressed in the Ag E&S Plan.

        - Have a stabilized, non-eroding surface, such as compacted stone, concrete, etc., are not required to be addressed in the Ag E&S Plan.

- How to find more information about the watershed where your operation is located:

    You can view your operation's specific watershed on the Department's website. Both eMapPA and the Integrated Report Viewer contain interactive maps that allow you to search for your operation to find additional information.

    - eMapPA shows the existing uses of surface waters of this Commonwealth, including special protection waters, which are High Quality Waters (HQ) and Exceptional Value Waters (EV). To search for your address and view the existing uses of streams near your operation, including HQ and EV waters:

        - Click on the "Task" tab, then click on "Locate" and enter your address.

        - Click on the "Layers" tab, expand the "Regulated Facilities and Related Information" heading, expand the "Streams and Water Resources" and select "Water Quality".

    - The Integrated Report Viewer shows the water quality status of surface waters of this Commonwealth, which includes impaired streams and the sources and pollutants causing the impairment. To search for your address and view the water quality status of streams near your operation, including impaired streams with the associated pollutants and sources (such as siltation from agricultural activity):

        - Type your address in the search box and click on the correct match that appears directly below.

        - Click on the "Layers" tab and expand each "Aquatic Life" subheading to view the legend; red-colored streams are those that are considered impaired.

        - Click on any impaired stream on the map to view more information, including the impairment source and pollutant causing the impairment.

If you feel comfortable writing an Ag E&S Plan for your operation, you may move on to Part 2 of this guidance. There is also an Ag E&S Plan Template in Part 3 of this guidance you may use to complete your plan.

PART 2 – MANUAL FOR PLAN DEVELOPERS

AGRICULTURAL EROSION & SEDIMENT CONTROL PLAN (AG E&S PLAN) ELEMENTS

Note: This manual divides the items found in an Ag E&S Plan into five sections for the purposes of organization and discussion. Following this format is recommended but not required.

An Ag E&S Plan consists of Best Management Practice (BMP) narratives, maps, information on the operation's pasture and near-stream areas, information on the farmsteads and Animal Heavy Use Areas (AHUAs), crop rotations, and evidence that predicted soil loss will not exceed the soil loss tolerances. A sample Ag E&S Plan with instructions is provided in Part 3, along with a checklist to determine if the plan meets regulatory requirements in 25 Pa. Code § 102.4(a).

Section 1: General Information

The information for the operator, landowner, and Ag E&S Plan preparer and the date of plan development may be included at the beginning of this section for logistical purposes. Information on the specific operation must be incorporated, including: crop rotations, tillage and planting methods, operation location and description, acreage, soil information, and map(s) of owned and rented lands. These map(s) must identify the following features:

- Surface waters of this Commonwealth
- Drainage patterns (topography)
- Field and property boundaries
- Soil maps indicating the types and boundaries of soils (if this information is not provided elsewhere in the plan)
- AHUAs
- Roads and crossroads
- Structural BMPs, existing and proposed
- Buildings and farm structures

You may also include identifiers for each field and acreages. Aerial photographs are highly recommended as an underlay for the map. Map(s) that were supplied with the operation's Nutrient Management Plan (NMP) or Manure Management Plan (MMP) may be used if all the required information above is provided.

Section 2: Soil Loss

In addition to providing soil information, an Ag E&S Plan must contain documentation for plowing and tilling activities (including no-till) that the predicted average annual soil loss (A) for each field, and proposed crop rotations, will not exceed the soil loss tolerance (T) for the dominant soil type in that field over the planned crop rotation. Calculations and/or printouts of reports must be included for all methods used to determine soil loss. Soil loss tolerance (T) is the maximum rate of annual soil loss that will allow crop productivity to be sustained on a given soil while limiting the risk of accelerated erosion. Erosion is greater than T if either the water erosion or the wind erosion rate exceeds T or there is visible gully erosion. Additional BMPs are required if initial calculations show T is exceeded; include those BMPs in Section 3.

- Soil loss is described as tons per acre per year (tons/acre/year) for each field.

- Dominant soil type is determined by the soil type that is most prevalent in a field unless another method is approved by the Pennsylvania Department of Environmental Protection (Department).

- If 25% or more of the field has a significantly steeper slope, use the more restrictive soil type.

- Crop residue should be evaluated, as conservation tillage is only recognized when surface residues exceed 30% after planting. In some cases, much more residue may be needed to aid in reducing erosion.

Section 3: Cropland, Hayland, and Pasture BMPs

Section 4: Fields Along Streams and Rivers

Section 5: Animal Heavy Use Areas

These three sections contain BMPs that will be used or are being used to minimize/reduce accelerated erosion and sedimentation.

<u>These sections must include the following information</u>:

- Existing and proposed BMP descriptions, AHUA practices and procedures (including descriptions of each AHUA), BMP schedules, and Operation and Maintenance (O&M) information for the BMPs.

    - BMPs must be identified in the plan, along with specific information on how the operator/landowner will implement each practice. Chapter 102 regulations state that BMPs and their design standards are listed in the current amended and updated version of the appropriate Natural Resources Conservation Service (NRCS) conservation practice standards, which can be found in the *PA NRCS Field Office Technical Guide*, Section IV. If technical guide standards are not used, you may need to contact the Department for approval and to ensure the planned practices appropriately address the resource concerns.

    - Hayland and pastures: These areas may eventually need to be reseeded/tilled (including no-till), which is why they would require an Ag E&S Plan. If these are the only lands on the operation that require an Ag E&S Plan, reseeding is not anticipated for several years, and no other earth disturbance activity in the fields is planned, they do not need immediate attention. They will, however, need addressed in an Ag E&S Plan prior to performing any reseeding or other earth disturbance activity.

- For plowing and tilling activities on fields with less than 25% plant or crop residue cover and within 100 feet of a river or stream (perennial or intermittent), additional and appropriate BMPs to minimize accelerated erosion and sedimentation are required. The BMPs, including any practices to increase cover, must be identified in the plan, along with specific information on how the operator/landowner will implement each practice. Section 4 in Part 3 of this manual (page 31) provides some examples of BMPs that can be used in these situations.

- For AHUAs, the plan identifies appropriate BMPs that minimize accelerated soil erosion and sedimentation on unimproved, unstabilized earthen lots; also include BMPs to control sediment leaving the site and water entering the site. This does not include entrances, pathways, and walkways between areas where animals are housed or kept in concentration unless animals consistently congregate there. Any temporary confinement areas, such as areas for winter feeding, and which are vegetated most of the year are considered seasonal AHUAs and need to

be addressed. These BMPs must be identified in the plan, along with specific information on how the operator/landowner will implement them.

- O&M criteria for all BMPs, included with the BMP descriptions. All existing BMPs that are necessary for meeting T are expected to either be maintained indefinitely or replaced with different BMPs that also meet T. Per Chapter 102 regulations, BMPs and their design standards, which includes O&M criteria, are listed in the current amended and updated version of the appropriate NRCS conservation practice standards, which can be found in the *PA NRCS Field Office Technical Guide*, Section IV.

- An acceptable BMP implementation schedule.

    - The BMP implementation schedule should be realistic; the Department recommends implementation within three years from the date the plan was written. Consideration should be given to potential delays related to weather conditions, obtaining any necessary permits, availability of contractors, etc. For example, if a terrace system is planned to reduce erosion and runoff, but the operator/landowner has not yet obtained quotes from excavating contractors, it is not feasible to plan the implementation of that practice within a few months of the date of plan development.

    - Any temporary BMPs should be identified as such in the plan.

    - Visible sediment pollution that can be seen entering or is suspected of entering any surface water needs to be addressed immediately.

    - BMPs must be implemented according to the schedule in the plan.

Additionally, the Plan Must Be Consistent With:

- The operation's current NMP or MMP. The existing and proposed BMP descriptions, AHUA practices and procedures, tillage systems, implementation schedules, and crop rotations should be reflected in the operation's NMP or MMP.

- Both existing and proposed conditions and activities on the operation, including surface waters, drainage patterns, and field boundaries. If the provisions of the plan are currently being implemented on the operation, the plan is consistent with the operation's conditions and activities. If the plan meets any of the thresholds for an update as described in Part 1 (page 7), it is not considered consistent with the current operation.

IDENTIFYING LOCATIONS OF CONCERN – PHYSICALLY WALK THE OPERATION

Locations identified as having erosion or the potential for erosion should be identified and addressed with appropriate BMPs designed to minimize accelerated erosion and sedimentation.

In general, soil erosion and sediment can be controlled by altering the amount, concentration, and/or velocity of stormwater; by altering soil cover conditions such as residue or crop cover; and by implementing practices such as no-till and cover crops that increase water infiltration. A variety of BMPs can be considered to slow runoff or stabilize the soil.

1. Farmsteads and Livestock

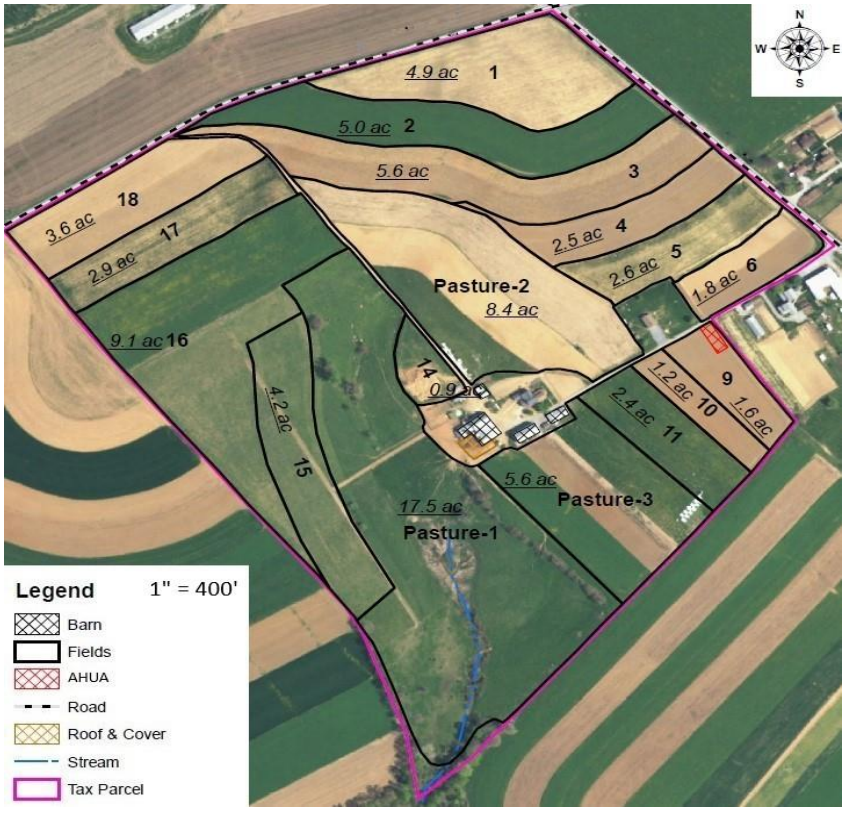
In general, the only required element in an Ag E&S Plan on the farmsteads of an operation would be related to AHUAs. The implementation and maintenance of erosion and sediment control BMPs are required for all AHUAs, regardless of the size, and you must identify them in a written Ag E&S Plan if their TOTAL, combined sum on an operation disturbs 5,000 or more square feet. These AHUAs should include the identification of existing and/or proposed BMPs to minimize accelerated erosion and sedimentation.

2. Fields (Cropland and Hayland)

Sheet and Rill Erosion (Soil loss tolerance)

The implementation and maintenance of erosion and sediment control BMPs are required for all agricultural plowing and tilling activities, regardless of the land area involved, and you must identify them in a written Ag E&S Plan if their TOTAL, combined sum on an operation disturbs 5,000 or more square feet. The plan must document that the average predicted soil loss over every crop rotation for each field meets T and include soils maps and topographic maps for the entire operation. Official soil data is updated periodically by NRCS, so the most current data and soil maps must be used. Sufficient management and/or structural BMPs must be included in the plan to minimize accelerated erosion and to prevent sediment pollution to the waters of this Commonwealth. Soil loss tolerances, expressed in tons per acre per year, denote the maximum level of soil erosion that allows high levels of sustainable economic crop productivity while limiting the risk of accelerated erosion.

The following is an example of an operation's fields when mapped.



The predicted average annual soil loss (A) is found using the Water Erosion Prediction Project (WEPP), the Revised Universal Soil Loss Equation (RUSLE/RUSLE2), an official NRCS-developed water erosion prediction technology, the PAOneStop Farm Mapping and E&S Planning System or another method approved by the Department. Their purpose is to predict average annual soil losses in runoff from specific field areas under specified cropping and management systems. All methods must be used according to their respective official standards and guidance. Calculations and/or printouts of reports must be included for all methods used.

BMPs may be planned in conjunction with calculating soil loss. These practices include, but are not limited to:

- Conservation tillage
- No-till
- Cover crop
- Contour farming
- Strip-cropping
- Buffer strips
- Terraces, diversions, waterways
- Residue management

The effectiveness of a BMP in any given field can be evaluated by comparing the predicted soil loss of the field, which has accounted for that BMP, with the T for the specific soils involved. Additional information can be found in the *PA NRCS Field Office Technical Guide*.

Important Note Regarding RUSLE2 Results:

RUSLE2 calculated soil loss results are estimated values that may exceed T by no more than 0.9 tons for a given rotation provided all the following apply:

- There is no evidence of rill erosion at any time of year throughout the rotation.
- The planner has confidence that erosion is at or below T.
- The predicted soil loss rates as calculated are included.

When these conditions are met, add this statement to the RUSLE2 printout: "Per PA NRCS guidance, 0.9 tons or less above T is acceptable where rills are absent throughout the year and the planner is confident that soil loss for the rotation is at or below T."

Concentrated Flow Erosion (Gully Erosion)

Along with sheet and rill erosion, concentrated flow erosion (i.e., gully erosion) may also be of concern on certain fields. Gully erosion generally occurs due to natural drainage patterns; water will find the path of least resistance, which will be the lowest point in the field. One means of determining the risk of concentrated flow is to view topographic maps with two-foot or five-foot interval delineated contours. Drainage patterns typically can be identified using this method, prior to walking the fields. Aerial maps are also a good means of identifying historic issues with concentrated flow and gully erosion.

BMPs must be planned to mitigate and address accelerated erosion and sedimentation, which includes gully erosion. The typical practices include plow-skip waterways, constructed grassed

waterways, and rock-lined waterways. Practices such as no-till and cover crop help to decrease the risk of concentrated flow erosion by increasing infiltration rates, organic matter, and soil cover; however, concentrated flow is predicated on drainage patterns so BMPs that address concentrated flow erosion must be implemented. The BMP implementation schedule set forth in the plan must also be followed. Practices to address gully erosion are identified and described in the *PA NRCS Field Office Technical Guide*.

3. Pastures and AHUAs

Pastures that are overgrazed or denuded are considered AHUAs, which are regulated under the agricultural erosion and sediment control requirements in 25 Pa. Code § 102.4(a). Please note that signs of overgrazing are not limited to bare ground. Other signs may include overall stunted plants, increased space between individual plants, clumps of denser vegetation throughout the pasture, dominance of low-quality plants, and, depending on the types and quality of plants available, very even overall plant height that is less than three inches or very spotty areas of taller, less-desirable vegetation.

AHUAs that disturb a combined total area greater than or equal to 5,000 square feet must be included in the operation's Ag E&S Plan, along with BMPs to address accelerated erosion and sedimentation. One way to prevent the loss of soil from AHUAs is to convert them into pastures by maintaining permanent grass through the implementation of supporting BMPs, such as paddock fencing, roof runoff structures, diversions, prescribed grazing plans, watering systems, pipelines, and other practices that encourage sustainable pastures. Note that permanent stabilization using vegetation requires a minimum uniform 70% perennial vegetative cover, with a density capable of resisting accelerated erosion and sedimentation.

Additionally, a sacrifice lot is an option that can be used when pastures are unable to sustain the livestock. They allow the pastures time to recover to meet the permanent stabilization requirement discussed above.

An Ag E&S Plan should include all pastures as existing BMPs if managed as pastures and include all existing AHUAs that need to be addressed with proposed BMPs and schedules for implementation.

AHUAs near surface waters or that have the potential to impact surface waters must be addressed and should not be included in the acreage of the pasture unless the AHUA will be managed as pasture. AHUAs should be protected with a stabilized, non-eroding surface (concrete, rolled or crushed stone). Earthen surfaces subject to erosion should be protected from off-site runoff, be located on flatter slopes, and sited above areas with 70% vegetative cover. Additional types of stormwater management BMPs may be needed; otherwise, livestock should be excluded from the area with fence or another management approach to allow vegetation to become established. Some other common BMPs include diverting runoff water with diversions, grassed waterways to carry water through the site, roof runoff structures, and terraces to collect or divert water around the site.

Note: Horse riding arenas/rings that have a combined sum of 5,000 square feet or greater are considered AHUAs. As with any other AHUA, they need to be addressed in the Ag E&S Plan only if they are earthen; that is, they do not have a stabilized, non-eroding surface such as compacted stone or concrete.

PART 3 – AGRICULTURAL EROSION AND SEDIMENT CONTROL PLAN

AGRICULTURAL EROSION AND SEDIMENT CONTROL PLAN (AG E&S PLAN) ADMINISTRATIVE COMPLETENESS REVIEW GUIDE

Operation Name	
Location Address	

A written Ag E&S Plan is required for agricultural plowing and tilling activities (including no-till practices) and Animal Heavy Use Areas (AHUAs) that each disturb land totaling 5,000 square feet or more. The items listed below are required by 25 Pa. Code § 102.4(a) for a complete Ag E&S Plan, except for #1 and #2. Place a checkmark in the proper box to denote if that item is incorporated. Any "No" items for #3 – #9 are deficiencies that should be addressed with the operator/landowner.

1.	Contact information for operator, landowner, and plan preparer (as applicable)		☐**Yes** ☐**No**
2.	Date of plan development or update		☐**Yes** ☐**No**
3.	Operation information, including:	• Acreage (for both owned and rented lands)	☐**Yes** ☐**No**
		• Description	☐**Yes** ☐**No**
		• Crop rotations	☐**Yes** ☐**No** ☐**N/A**
		• Tillage and planting methods	☐**Yes** ☐**No** ☐**N/A**
		• Soil information	☐**Yes** ☐**No**
4.	Map(s) for both owned and rented lands, including:	• Surface waters of this Commonwealth	☐**Yes** ☐**No** ☐**N/A**
		• Drainage patterns (topography)	☐**Yes** ☐**No**
		• Field and property boundaries	☐**Yes** ☐**No**
		• Buildings and farm structures	☐**Yes** ☐**No**
		• AHUAs	☐**Yes** ☐**No** ☐**N/A**
		• Roads and crossroads	☐**Yes** ☐**No**
		• Structural Best Management Practices (BMPs), existing and proposed	☐**Yes** ☐**No** ☐**N/A**
		• Soil types and boundaries (if not provided elsewhere)	☐**Yes** ☐**No** ☐**N/A**
5.	Plowing and tilling activities (cropland, hayland, and pastures):	• Documentation that the soil loss will be limited to the soil loss tolerance (T) over the planned crop rotations	☐**Yes** ☐**No** ☐**N/A**
		• BMPs with descriptions, acceptable implementation schedules, and Operation & Maintenance (O&M) criteria	☐**Yes** ☐**No** ☐**N/A**
6.	Plowing and tilling activities on fields < 25% plant or crop residue cover & within 100' of a river or stream (perennial or intermittent):	• Additional BMPs, including descriptions, acceptable implementation schedules, and O&M criteria	☐**Yes** ☐**No** ☐**N/A**
7.	AHUAs:	• Descriptions of the AHUAs (type, size, location, etc.)	☐**Yes** ☐**No** ☐**N/A**
		• BMPs with descriptions, acceptable implementation schedules, and O&M criteria	☐**Yes** ☐**No** ☐**N/A**
8.	Plan is consistent with the operation's current Nutrient Management Plan (NMP) or Manure Management Plan (MMP); see Note below		☐**Yes** ☐**No** ☐**N/A**
9.	Plan is consistent with both existing and proposed conditions and activities on the operation, including surface waters, drainage patterns, and field boundaries		☐**Yes** ☐**No**

<u>Note</u>: The Ag E&S Plan generally works together with the NMP or MMP required for operations that land apply manure and agricultural process wastewater. Certain sections of the Ag E&S Plan (e.g., maps) and MMP may be used, as applicable, to satisfy the requirements of both plans.

AG E&S PLAN INSTRUCTIONS

The required content of an Ag E&S Plan is best displayed in a logical and easily identifiable planning system. There is no requirement on how the material must be presented, but the following guidance is recommended to ensure the necessary content is included in the Ag E&S Plan. This guidance divides the Ag E&S Plan content into five sections. The sections include:

SECTION 1: GENERAL INFORMATION. This section provides general information about the operation, including a description, acreage, crop rotations, and tillage and planting methods. A cover page can be used to provide information to identify the agricultural operation, the operator, the property owner, the plan developer, and the date the plan was developed. Map(s) and soil information should also be included.

SECTION 2: SOIL LOSS. For agricultural plowing and tilling activities, including no-till, the plan must, at a minimum, limit soil loss from accelerated erosion (sheet, rill, and gully) to T over the planned crop rotations. Documentation, in the form of calculations or report printouts from an erosion prediction technology approved by the Pennsylvania Department of Environmental Protection (Department), must be included.

SECTION 3: CROPLAND, HAYLAND, AND PASTURE BMPs. This includes any BMPs necessary to meet T and any other existing and/or proposed BMPs to minimize accelerated erosion and sedimentation, including those BMPs for issues found when evaluating the operation. BMP descriptions, operation and maintenance (O&M) information, and implementation schedules must be included. Per Chapter 102 regulations, BMPs and their design standards, which includes O&M criteria, are listed in the current amended and updated version of the appropriate Natural Resources Conservation Service (NRCS) conservation practice standards, which can be found in the *PA NRCS Field Office Technical Guide*, Section IV.

SECTION 4: FIELDS ALONG STREAMS AND RIVERS. For agricultural plowing and tilling activities that will occur on fields with less than 25% plant cover or crop residue cover and within 100 feet of a river, or perennial or intermittent stream, additional BMPs shall be identified to minimize accelerated erosion and sedimentation. BMP descriptions, O&M information, and implementation schedules must be included. Per Chapter 102 regulations, BMPs and their design standards, which includes O&M criteria, are listed in the current amended and updated version of the appropriate NRCS conservation practice standards, which can be found in the *PA NRCS Field Office Technical Guide*, Section IV. This section is only necessary if the farm has fields along a stream or river.

SECTION 5: ANIMAL HEAVY USE AREAS. The plan must identify BMPs to minimize accelerated erosion and sedimentation. Descriptions of the AHUAs, BMP descriptions, O&M information, and implementation schedules must be included. Per Chapter 102 regulations, BMPs and their design standards, which includes O&M criteria, are listed in the current amended and updated version of the appropriate NRCS conservation practice standards, which can be found in the *PA NRCS Field Office Technical Guide*, Section IV. Guidance on managing AHUAs located in pastures can be found in the NRCS prescribed grazing practice standard. This section is only necessary if the farm has AHUAs.

> **Note:** Any agricultural land clearing projects for new cropland and/or pastures should be addressed in this Ag E&S Plan. This includes any forested lands on the operation. Please refer to Appendix C, Clearing and Grubbing for Conversion to Agriculture, for more information.

SECTION 1: GENERAL INFORMATION

This section provides general information about the operation. A cover page can provide information to identify the agricultural operation and its location, the operator, the property owner, and the Ag E&S Plan preparer with the date of development. Map(s) and soil information should also be included.

The plan map (or maps) must include:

- Surface waters of this Commonwealth; Chapter 102 defines surface waters as perennial and intermittent streams, rivers, lakes, reservoirs, ponds, wetlands, springs, natural seeps, and estuaries.
- Drainage patterns (topography)
- Field and property boundaries
- Buildings and farm structures
- AHUAs
- Labeled roads and crossroads
- Structural BMPs, existing and proposed
- Soil maps indicating the types and boundaries of soils (if this information is not provided elsewhere in the plan)

It is recommended to add unique field identifiers on the map as well as acreages.

If identifying all the BMPs on the plan map becomes difficult to manage in a clear manner (for example, if the operation spans large acreages), additional plan maps (such as one focused on the farmsteads, other maps focused on specific fields, etc.) should be provided to clearly display all necessary items. It is recommended to create separate maps for the soils and drainage patterns (topography). Soil maps must have the soil labels included on the map and a soils legend. The topographic map may use United States Geological Survey (USGS) topography; however, it is recommended to use topographic maps with at least 5- or 2-foot contours to better visualize the drainage patterns and to help identify any existing or anticipated concentrated flow resource concerns.

All maps should be to scale and have a scale printed with the map. The plan maps should also contain a symbol for direction (such as a north arrow). Pages 35, 36, and 38 show examples of an operation map, a soils map, and a topographic map; these maps can be obtained using the PAOneStop Farm Mapping and E&S Planning System. Soil maps can also be obtained using the Pennsylvania Soil Survey. Map(s) that were supplied with the operation's NMP or MMP may be used if all the required information above is provided. Aerial maps are highly recommended.

SECTION 2: SOIL LOSS

Finding the Tolerable Soil Loss (T) Value

Erosion is a natural geologic process, but the levels of erosion can be accelerated by human activity. The tolerable soil loss is an estimation of the maximum soil loss that can occur and still assure long term productivity of the land while limiting the risk of accelerated erosion. There is a "given" T value for each soil type in every Pennsylvania county.

In Pennsylvania, the T values range from one ton of soil loss/acre/year to five tons of soil loss/acre/year. Soil T ratings can be found in the Pennsylvania Soil Survey and PAOneStop. You may also contact your local county conservation district, NRCS, and/or a commercial planner for more information. Official soil data is periodically updated by NRCS, so the most current data and soil maps must be used. If the Pennsylvania Soil Survey website is not used to obtain this information, you must ensure that the data is current and provide the source used.

Finding the Predicted Average Annual Soil Loss (A) Value

As previously stated, the Ag E&S Plan must include documentation that the predicted soil loss will be limited to T over the planned crop rotations. This information can be obtained using PAOneStop. You may also contact your local county conservation district and/or a commercial planner for more information. If you need help evaluating all resource concerns on your operation, including soil erosion, and are willing to use one or more conservation practices to address those concerns, you may want to contact NRCS. Soil loss calculations will be provided with the NRCS Conservation Plan.

Section 2 of the Ag E&S Plan Template (page 48) provides tables that may be used to list the required information. Calculations must also be provided. If the Water Erosion Prediction Project (WEPP), the Revised Universal Soil Loss Equation (RUSLE/RUSLE2) or PAOneStop is used to obtain the average annual soil loss, provide printouts of those reports/calculations.

If Appendix B is used for any of your rotations, you do not have to find the Predicted Average Annual Soil Loss or provide calculations for those rotations.

SECTION 3: CROPLAND, HAYLAND, AND PASTURE BMPs

This section includes any BMPs necessary to meet T, existing and/or proposed BMPs to address concentrated flow (gully) erosion, and any other existing and/or proposed BMPs to address accelerated erosion and sedimentation. Any issues in crop fields, hay fields, and/or pastures found when evaluating the operation should also be included here.

BMPs AND IMPLEMENTATION – APPLICABLE FOR SECTIONS 3, 4, AND 5

Every existing and proposed BMP should be detailed, which includes both structural BMPs (heavy use area protection, diversions, etc.), and management-related BMPs (cover crops, prescribed grazing, etc.). The BMPs should include site-specific narratives that describe the practice, how to implement the practice, and how to operate and maintain the practice.

Hayland and pastures may eventually need to be reseeded/tilled (including no-till), which is why they would require an Ag E&S Plan. If these are the only lands on the operation that require an Ag E&S Plan, reseeding is not anticipated for several years, and no other earth disturbance activity in the fields is planned, they do not need immediate attention. They will, however, need addressed in an Ag E&S Plan prior to performing any reseeding or other earth disturbance activity.

BMPs that are not in place and cannot be installed directly should be identified in an implementation schedule. BMPs that are already in place should be identified with the date they were implemented.

Determining an appropriate implementation schedule varies. Visible sediment pollution that can be seen entering or is suspected of entering any water source needs to be addressed immediately with implementation of appropriate BMPs. It is recommended to implement BMPs needed to meet T over the planned crop rotations next, followed by certain management practices that may be implemented sooner than structural practices. This would apply to simpler BMPs, such as contour buffer strips, riparian grassed buffers, some tillage practices (primarily if switching to a less aggressive tillage practice), cover crop, and adjusting the crop rotation. At times, temporary BMPs may need to be used until the appropriate permanent BMPs can be constructed. The Department recommends implementation of BMPs within three years of the date the Ag E&S Plan is written.

Discussions with the operator/landowner should be held to decide the most appropriate and feasible timeframes for implementation to make the plan as beneficial as possible for both the operation and water quality. Unless there is visible sediment pollution occurring on the operation, planners should consider weather, construction season, growing season, and other factors that may impact the ability to follow the proposed schedule. The BMPs must be operated and maintained as long as there are agricultural plowing or tilling activities or AHUAs on the operation.

The planner and the operator/landowner must remember that regulations require not only for the Ag E&S Plan to be complete, but also that the operator/landowner is on schedule for implementing the plan. It is not helpful to the operator/landowner to plan everything to be implemented in a time frame that they are not capable of meeting, such as planning all BMPs for the same month and year. It is also not helpful to provide the maximum time frame for all BMPs, as that is not the purpose of an Ag E&S Plan.

The following are examples of an existing Roof Runoff Structure BMP and an existing Cover Crop BMP, shown in a commonly-reported format, with descriptions, O&M information, and implementation schedules.

Note: In the following examples, the two letters to the right of the name of each BMP represent the units used for the amounts listed in the tables (i.e., in the first example, "NO" stands for the number installed; in the second example, "AC" stands for acres). The "planned amount/date" is sometimes listed for practices that have not yet been implemented, with the "applied amount/date" later documented for when they are actually implemented.

ROOF RUNOFF STRUCTURE NO

Structures that collect, control and transfer precipitation from roofs.

Ensure that all roofs pitched toward and animal confinement/traffic area or manure storage/handling area have roof gutters and downspouts directed to a clean and stabilized outlet.

Gutters & Downspouts shall be periodically checked for: (1) Blockages/debris – Material shall be removed, (2) Loose/unconnected hangers – Shall be made secure, (3) Leakage – Patching or replacement made, (4) Downspouts shall be shielded from livestock access. Downspouts shall be periodically checked for: (1) Damage – Crushed sections shall be removed and replaced, (2) Guards/shields shall be maintained, (3) Outlets – Water from gutters and downspouts shall be directed away from feedlots and animal holding areas, (4) Outlets shall be maintained to prevent pooling of water or the occurrence of excessive erosion.

Land Unit	Planned Amount	Planned Date	Applied Amount	Applied Date
Field 6	1	4/2018	1	4/2018
Total:	1	4/2018	1	4/2018

COVER CROP AC

Grasses, legumes, and forbs planted for seasonal vegetative cover. Annuals or perennials that protect the soil from erosion can be planted in the fall to protect the soil surface and further reduce the erosion on the field. This could also offer an opportunity for additional forage production.

Plant a small grain cover crop (rye, triticale, or oats seeded at a rate of at least 2bu/ac) after corn and soybean harvest to reduce sheet and rill erosion and to improve soil quality. Plant early enough to provide four inches of height or fifty percent canopy cover before winter or to provide adequate biomass before spring planting. Establish cover crop using no-till establishment methods whenever possible.

Land Unit	Planned Amount	Planned Date	Applied Amount	Applied Date
Field 1	25.3	4/2018	26.5	4/2018
Field 2	23.2	4/2018	23.9	4/2018
Field 3	16.7	4/2018	16.9	4/2018
Field 4	19.5	4/2018	19.5	4/2018
Total:	84.7	4/2018	84.7	4/2018

SECTION 4: FIELDS ALONG STREAMS AND RIVERS

Plowing activities near streams and rivers that leave the soil exposed create a greater chance for soil to wash into those waters during storm events. For agricultural plowing or tilling activities that will occur on fields with less than 25% plant cover or crop residue cover, and within 100 feet of a river, or perennial or intermittent stream, additional BMPs are required to minimize accelerated erosion and sedimentation.

This section is only necessary if the operation has fields along a stream or river.

Streamside management practices that are utilized for minimizing accelerated erosion and sedimentation include grassed and forested riparian buffers, streambank livestock exclusion fencing, streambank stabilization, stream restoration, stream crossings, and floodplain restoration. Note the reference to 25% minimum cover within 100 feet of the streambank. This 25% minimum cover may be met via implementation of no-till and/or conservation till, cover crop, perennial grassed or forested riparian buffers.

The Ag E&S Plan should identify these fields and the BMPs being implemented.

The following BMPs are acceptable alternatives to meet near-stream requirements when cover is <25%.

1. **Modify the crop rotation** to exclude the low cover situation in the field near the stream. The near-stream field may be planted to permanent sod-forming crops such as grass hay, or when silage is in the rotation, substitute corn grain (fodder left on the ground) for silage in the near-stream field.

2. **A 35-foot permanent vegetative buffer** may be used alone or as part of a system in these field locations.

3. **Incorporate no-till into rotation and tillage practices;** must be practiced continuously for 7 or more years.

4. **Harvest corn silage** to leave 20 or more inches of standing stalk, then flatten remaining stalks by rolling the field stubble.

5. **Establish cover crop;** should be planted as soon as practically possible, within 10 days after prior crop harvest. To reduce erosion, best results are achieved when the combined canopy and surface residue cover attains 90% or greater during the period of potentially erosive wind or rainfall.

Additionally, perimeter control BMPs used for construction-related earth disturbance activities may be options, so long as those practices are maintained. More information on these practices can be found in the Department's *Erosion and Sediment Pollution Control Program Manual*.

SECTION 5: ANIMAL HEAVY USE AREAS

These areas are defined as a barnyard, feedlot, loafing area, exercise lot or other similar area on an agricultural operation where, due to the concentration of animals, it is not possible to establish and maintain vegetative cover of a density capable of minimizing accelerated erosion and sedimentation by usual planting methods. Any temporary confinement areas, such as areas for winter feeding, which are vegetated most of the year are considered seasonal AHUAs and need to be addressed.

The term does not include entrances, pathways, and walkways between areas where animals are housed or kept in concentration unless animals consistently congregate there. The plan must identify BMPs to minimize accelerated erosion and sedimentation from AHUAs.

This section is only necessary if the operation has AHUAs.

Addressing an AHUA can be one of the most challenging parts of the planning and implementation process, due to both the need to minimize accelerated erosion and maximize livestock access to certain areas throughout the barnyard area and pasture. AHUAs may be addressed by utilizing a combination of different practices, depending upon the size and location of the AHUA. One main point is to "keep clean water clean" by diverting all clean stormwater runoff around the AHUA. Some BMPs utilized to divert the water include roof gutters, downspouts, underground outlets, and diversions.

Concrete barnyards, which do not expose soil to runoff and can be scraped regularly to remove excess manure, are also a common practice. On non-concreted surfaces, AHUAs occur due to the overuse of an area by livestock on the farmsteads or pastures. If the AHUA exists in an area that is too large to construct a concrete barnyard, or exists in a pasture, exclusionary fencing (creating a sacrifice lot) and grass seeding and mulching of the actual pasture are common BMPs to address the resource concern. Earthen surfaces subject to erosion should be protected from off-site runoff, be located on flatter slopes, and sited above areas with 70% vegetative cover.

Common practices to address AHUAs are identified and described in the *PA NRCS Field Office Technical Guide*, Section IV. For planners and operators that require a higher level of assistance to properly plan the most suitable practices for AHUAs on their site, contact the local county conservation district, NRCS, and/or a commercial planner for assistance.

EXAMPLE AG E&S PLAN

SECTION 1: GENERAL INFORMATION

Agricultural Erosion & Sediment Control Plan

Operation Name: *Sample Farm*

Name of Operator/Landowner: *Mr. and Mrs. John and Amy Smith*

Operation Street Address: *3 Sample Road*

City, State, Zip Code: *Farmerville, PA 12345*

Phone Number (Home/Barn): *717-555-4567*

(Cell): *717-555-3456*

Email Address: *samplefarm@email.com*

Name of person preparing the Ag E&S Plan (if other than operator/owner)

Preparer Name: *Ms. R.E. Bell*

Preparer Organization: *Wild Pig Consulting Firm*

Street Address: *22 Chisel Lane*

City, State, Zip Code: *Farm City, PA 23456*

Phone Number: *412-555-4567*

Email Address: *rebell@wildpig.com*

Date of Development: *April 1, 2011*

Date of Update(s): *April 15, 2019*

Note: The operator and landowner shall have the Ag E&S Plan readily available for review and inspection.

OPERATION INFORMATION

a) Operation Acres:

Total Owned	*5.6*	Total Rented	*10.5*
Cropland Owned	*4.6*	Cropland Rented	*10.5*
Pasture Owned	*1*	Pasture Rented	*0*

b) Operation Description:

Small family farm consisting of 2 donkeys, 3 goats, and 40 chickens (layers). Manure is stacked on a 12' by 16' covered concrete pad beside the barn. 1 AHUA is located on the western side of the barn. Produces grain, soybeans, mixed hay, oats, and alfalfa.

c)

Crop Rotation(s) Used on the Operation	Tillage and Planting Method(s) for Crop Rotation(s)
1-year corn grain, 1-year soybeans	*Corn: No-till* *Soybeans: Chisel*
1-year corn grain, 1-year oats/wheat cover crop, 4-year hay	*Oats/Wheat: Chisel* *Corn/Hay: No-till*
1-year corn grain/rye cover crop, 1-year corn grain, 2-year alfalfa	*All no-till*
Continuous mixed hay	*No-till*

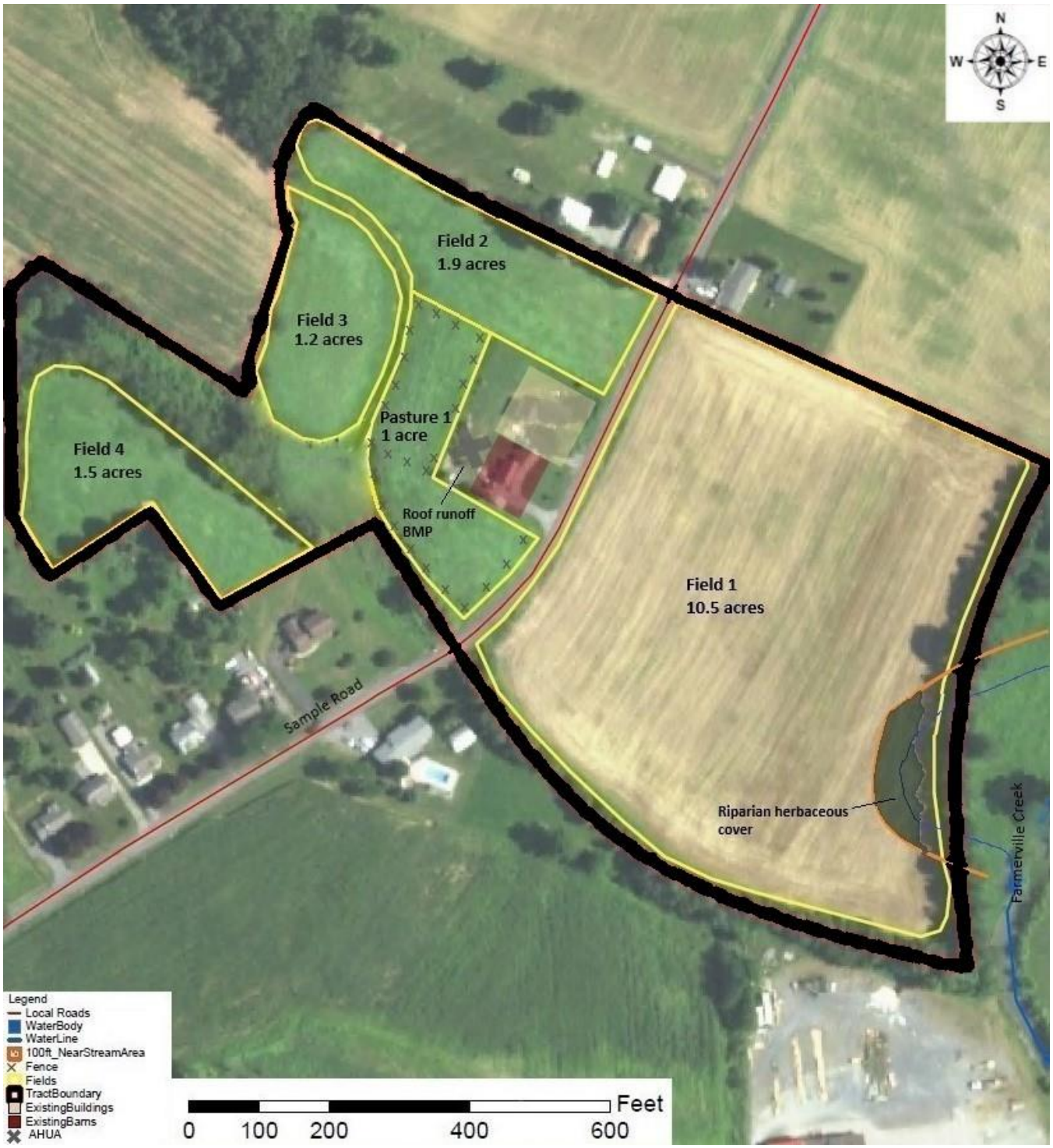
d) Are there crop fields within 100 feet of a stream or river? ☒ Yes ☐ No
If yes, complete Section 4.

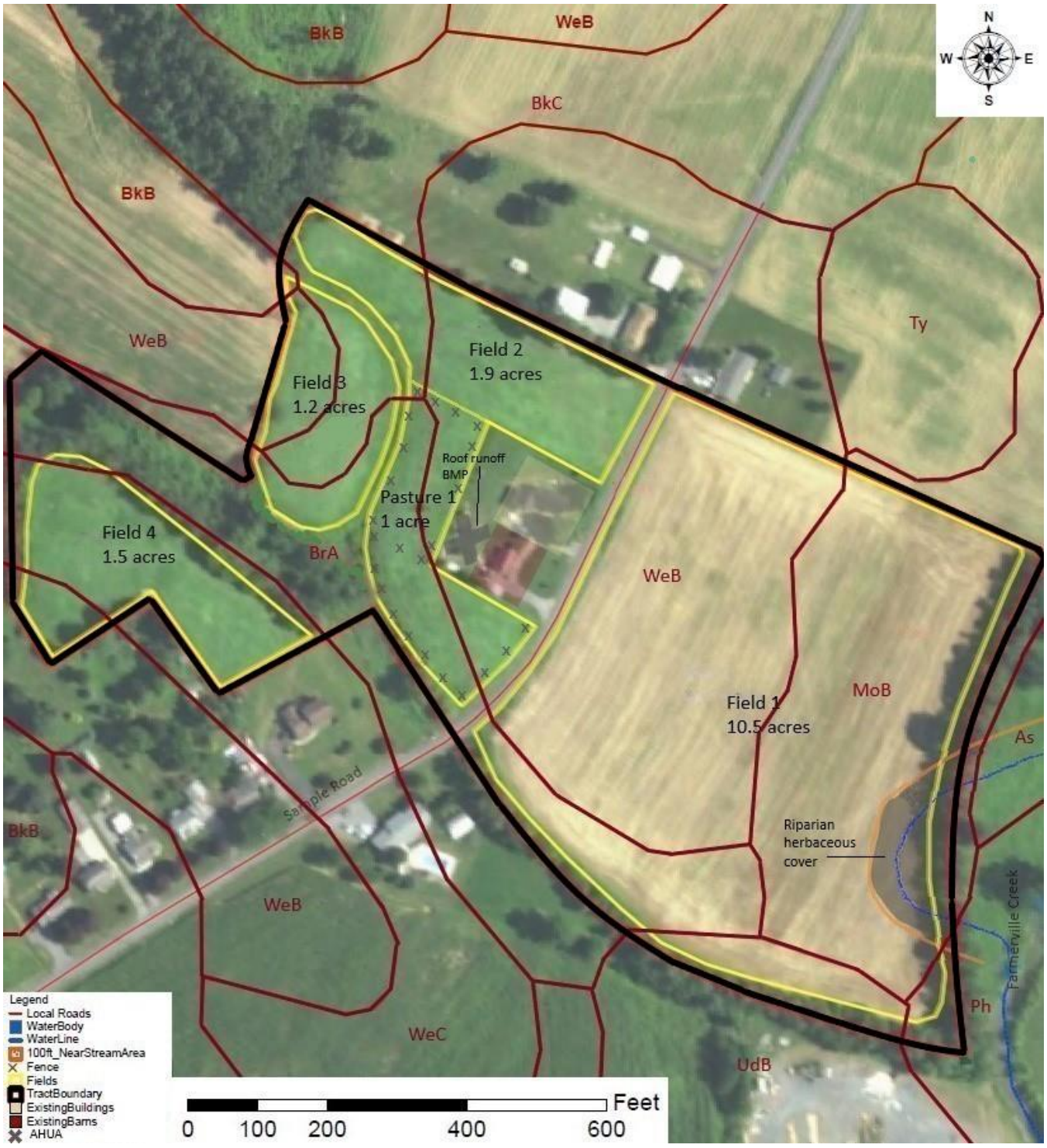
e) Animals: Are there animal heavy use areas on the farm? ☒ Yes ☐ No
If yes, complete Section 5.

f) Operation Map(s): Provided with all required information? ☒ Yes ☐ No
Included on page 35.

g) Soil Information: Provided for entire operation? ☒ Yes ☐ No
Included on page 36 and 37.

h) Topographic Map: Provided for entire operation? ☒ Yes ☐ No
Included on page 38.

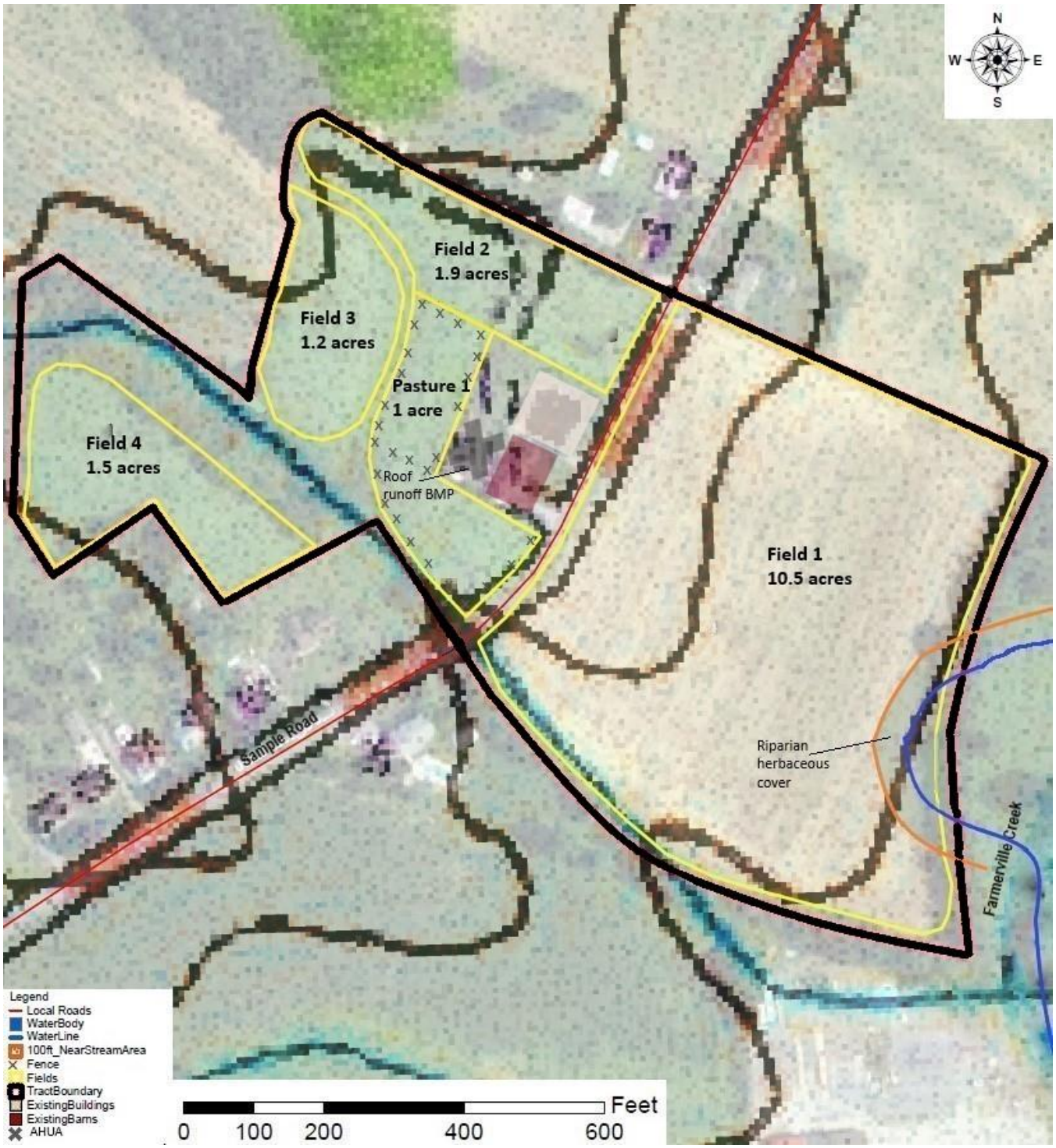

N
W
E
S
Field 2
1.9 acres
Field 3
1.2 acres
Pasture 1
1 acre
Field 4
1.5 acres
Roof runoff
BMP
Field 1
10.5 acres
Sample Road
Riparian herbaceous
cover
Farmerville Creek
Legend
Local Roads
WaterBody
WaterLine
100ft_NearStreamArea
Fence
Fields
TractBoundary
ExistingBuildings
ExistingBarns
AHUA
0
100
200
400
600
Feet


BkB
WeB
BkC
BkB
WeB
Field 3
1.2 acres
Field 2
1.9 acres
Ty
Roof runoff
BMP
Pasture 1
1 acre
Field 4
1.5 acres
BrA
WeB
MoB
Field 1
10.5 acres
As
Riparian
herbaceous
cover
Farmville Creek
Ph
BkB
WeB
WeC
UdB
N
W
E
S
Legend
Local Roads
WaterBody
WaterLine
100ft_NearStreamArea
Fence
Fields
TractBoundary
ExistingBuildings
ExistingBarns
AHUA
0
100
200
400
600
Feet

Major/Dominant Soil Type and Information for Each Field on Operation

Field Name	***Soil***	***Slope T Value***	***Slope Length, ft***	***Slope Steepness, %***
Field 1	*MoB, Monongahela silt loam, 3 to 8 percent slopes*	*4.0*	*150*	*6.0*
Field 2	*WeB, Weikert channery silt loam, 3 to 8 percent slopes*	*2.0*	*150*	*6.0*
Field 3	*BkC, Berks channery silt loam, 8 to 15 percent slopes*	*2.0*	*89*	*13.0*
Field 4	*WeC, Weikert channery silt loam, 8 to 15 percent slopes*	*1.0*	*110*	*11.0*
Pasture 1	*BrA, Brinkerton silt loam, 0 to 3 percent slopes*	*3.0*	*110*	*3.0*

Note: This information may be provided on a map or in a tabular form as shown on this page.


N
W
E
S
Field 2
1.9 acres
Field 3
1.2 acres
Pasture 1
1 acre
Field 4
1.5 acres
Roof
runoff BMP
Field 1
10.5 acres
Sample Road
Riparian
herbaceous
cover
Farmerville Creek
Legend
Local Roads
WaterBody
WaterLine
100ft_NearStreamArea
Fence
Fields
TractBoundary
ExistingBuildings
ExistingBarns
AHUA
0
100
200
400
600
Feet

SECTION 2: SOIL LOSS

Major/Dominant Soil Types on Farm	T Value (tons soil loss/acre/year)
WeC, Weikert channery silt loam, 8-15% slopes	*1*
BrA, Brinkerton silt loam, 0-3% slopes	*3*
BkC, Berks channery silt loam, 8-15% slopes	*2*
MoB, Monongahela silt loam, 3-8% slopes	*4*
WeB, Weikert channery silt loam, 3-8% slopes	*2*

SOIL LOSS CALCULATIONS

Predicted Average Annual Soil Loss Based on Planned Crop Rotation and Management:

Field	Rotation Year(s)	Management(s) – Crop Rotations and Tilling/Planting Methods	Predicted Average Annual Soil Loss	Soil Type T Value
1	*1*	*Corn grain, no-till*	*3.24*	*4*
1	*2*	*Soybeans, chisel*	*3.24*	*4*
2	*1*	*Corn grain, no-till*	*1.85*	*2*
2	*2*	*Oats, chisel*	*1.85*	*2*
2	*2*	*Wheat cover crop, chisel*	*1.85*	*2*
2	*3 – 6*	*Mixed hay, no-till*	*1.85*	*2*
3	*1*	*Corn grain, no-till*	*0.90*	*2*
3	*1*	*Rye cover crop, no-till*	*0.90*	*2*
3	*2*	*Corn grain, no-till*	*0.90*	*2*
3	*3 & 4*	*Alfalfa, no-till*	*0.90*	*2*
4	*All*	*Mixed hay, no-till*	*0.34*	*1*

Method Used to Determine Predicted Soil Loss: *PAOneStop*

Note: Calculations/report printouts must be included for all methods used. If your report printouts list the information above, you do not need to duplicate the information on this chart. If Appendix B is used, note this above for that field(s)/rotation(s); the "Predicted Average Annual Soil Loss" column does not need to be completed and calculations are not necessary.

Please copy this page as needed to document additional soil types and/or crop rotations.

SECTION 3: CROPLAND, HAYLAND, AND PASTURE BMPs

Summary of BMPs		
Field(s) #	**BMP**	**Date Implemented (or Scheduled Date for Proposed BMP)**
1 & 2	*Contour farming*	*4/1/2011*
2 & 3	*Cover crop*	*4/1/2015*
1 - 4	*No-till*	*4/1/2015*
Pasture 1	*Fence*	*5/15/2017*
Pasture 1	*Prescribed grazing*	*4/1/2011*

Note: If any dates listed above are for proposed BMPs and they are not implemented by that scheduled date, the Ag E&S Plan will need to be updated with the correct implementation date.

Please copy this page as needed to document additional BMPs.

BMP: *Contour farming*

Description of BMP:

Aligning ridges, furrows, and roughness formed by tillage, planting, and other operations to alter velocity and/or direction of water flow to around the hillslope to reduce erosion and increase water infiltration. Contour farming is most effective on slopes between 2 – 10% and slopes between 100 – 400 feet long. This is practiced on fields 1 and 2, which both have 6% slopes that are 150 feet in length.

Operation & Maintenance Information:

Perform all tillage and planting operations parallel to contour lines. Evaluate annually for signs of erosion or deviation from contour.

Implementation Schedule:

Field #	Amount of BMP (acres, feet, number, etc., as applicable)	Date Implemented (or Scheduled Date for Proposed BMP)
1	*10.5 acres*	*4/1/2011*
2	*1.9 acres*	*4/1/2011*

Note: If any dates listed above are for proposed BMPs and they are not implemented by that scheduled date, the Ag E&S Plan will need to be updated with the correct implementation date.

Please copy this page as needed to document additional BMPs.

In this example, a separate sheet would be submitted for each of the four other BMPs listed on the previous page to document the descriptions, O&M information, and implementation schedules for cover crop, no-till, fence, and prescribed grazing.

SECTION 4: FIELDS ALONG STREAMS AND RIVERS

Summary of BMPs		
Field(s) #	**BMP**	**Date Implemented (or Scheduled Date for Proposed BMP)**
Field 1	*Riparian herbaceous cover*	*4/1/2015*

Note: If any dates listed above are for proposed BMPs and they are not implemented by that scheduled date, the Ag E&S Plan will need to be updated with the correct implementation date.

Please copy this page as needed to document additional BMPs.

BMP: *Riparian herbaceous cover/buffer*

Description of BMP:

Plant a vegetative buffer adjacent to the stream. The riparian cover consists of grasses, sedges, rushes, ferns, legumes, and forbs comprising the ecosystems along riparian areas of water courses. The buffer should be 35 feet wide on each side of the stream as measured from the edge of the stream. This buffer is 100 feet wide on the western side of the stream and 35 – 60 feet wide on the eastern side of the stream. This buffer is also adjacent to forested land on either side of the stream.

Operation & Maintenance Information:

Inspect periodically and protect to maintain the intended purpose from adverse impacts, such as excessive vehicular/pedestrian traffic, pest infestations, pesticide use on adjacent lands, livestock damage, and fire.

Implementation Schedule:

Field #	Amount of BMP (acres, feet, number, etc., as applicable)	Date Implemented (or Scheduled Date for Proposed BMP)
1	*0.25 acre*	*4/1/2015*

Note: If any dates listed above are for proposed BMPs and they are not implemented by that scheduled date, the Ag E&S Plan will need to be updated with the correct implementation date.

Please copy this page as needed to document additional BMPs.

SECTION 5: ANIMAL HEAVY USE AREAS

Summary of BMPs				
AHUA #	**Location of AHUA**	**Description/Size**	**BMP**	**Date Implemented (or Scheduled Date for Proposed BMP)**
1	*Western side of barn*	*Earthen lot, approximately 0.18 acres*	*Roof runoff structure*	*6/15/2019*

Operators/landowners with AHUAs requiring both the development and implementation of BMPs need to immediately contact their local county conservation district and/or a commercial planner and must document that contact and the time frame for developing and implementing those practices. If operators with AHUAs are interested in evaluating all resource concerns and are willing to implement one or more conservation practices to address those resource concerns, you should contact NRCS.

If applicable, list date contact was made to the assisting agency/party to help in these efforts:

2/15/2019

If applicable, list who was contacted to assist in these efforts:

Ms. R.E. Bell, Wild Pig Consulting Firm

Note: If any dates listed above are for proposed BMPs and they are not implemented by that scheduled date, the Ag E&S Plan will need to be updated with the correct implementation date.

Please copy this page as needed to document additional BMPs.

BMP: *Roof runoff structure*

Description of BMP:

Installation of structures that will collect, control, and transfer precipitation runoff from the roof (gutters and downspouts). One structure will be installed at the AHUA located on the western side of the barn.

Operation & Maintenance Information:

Ensure that all gutters/downspouts are directed to a clean and stabilized outlet. Keep roof runoff structures clean and free of obstructions that reduce flow. Make regular inspections and perform cleaning/maintenance as needed. Structures should also be checked after major storms.

Implementation Schedule:

AHUA #	Amount of BMP (acres, feet, number, etc., as applicable)	Date Implemented (or Scheduled Date for Proposed BMP)
1	*1*	*6/15/2019*

Note: If any dates listed above are for proposed BMPs and they are not implemented by that scheduled date, the Ag E&S Plan will need to be updated with the correct implementation date.

Please copy this page as needed to document additional BMPs.

AG E&S PLAN TEMPLATE

SECTION 1: GENERAL INFORMATION

Agricultural Erosion & Sediment Control Plan

Operation Name: _____

Name of Operator/Landowner: _____

Operation Street Address: _____

City, State, Zip Code: _____

Phone Number (Home/Barn): _____

(Cell): _____

Email Address: _____

Name of person preparing the Ag E&S Plan (if other than operator/owner)

Preparer Name: _____

Preparer Organization: _____

Street Address: _____

City, State, Zip Code: _____

Phone Number: _____

Email Address: _____

Date of Development: _____

Date of Update(s): _____

Note: The operator and landowner shall have the Ag E&S Plan readily available for review and inspection.

OPERATION INFORMATION

a) Operation Acres:

Total Owned	_____	Total Rented	_____
Cropland Owned	_____	Cropland Rented	_____
Pasture Owned	_____	Pasture Rented	_____

b) Operation Description:

_____

_____

_____

_____

_____

_____

c) Crop Rotation(s) Used on the Operation	**Tillage and Planting Method(s) for Crop Rotation(s)**

d) Are there crop fields within 100 feet of a stream or river? ☐ Yes ☐ No
If yes, complete Section 4.

e) Animals: Are there animal heavy use areas on the farm? ☐ Yes ☐ No
If yes, complete Section 5.

f) Operation Map(s): Provided with all required information? ☐ Yes ☐ No
Please insert to make a complete E&S plan.

g) Soil Information: Provided for entire operation? ☐ Yes ☐ No
Please insert to make a complete E&S plan.

h) Topographic Map: Provided for entire operation? ☐ Yes ☐ No
Please insert to make a complete E&S plan.

SECTION 2: SOIL LOSS

Major/Dominant Soil Types on Farm	T Value (tons soil loss/acre/year)

SOIL LOSS CALCULATIONS				
Predicted Average Annual Soil Loss Based on Planned Crop Rotation and Management:				
Field	**Rotation Year(s)**	**Management(s) – Crop Rotations and Tilling/Planting Methods**	**Predicted Average Annual Soil Loss**	**Soil Type T Value**

Method Used to Determine Predicted Soil Loss: _____

Note: Calculations/report printouts must be included for all methods used. If your report printouts list the information above, you do not need to duplicate the information on this chart. If Appendix B is used, note this above for that field(s)/rotation(s); the "Predicted Average Annual Soil Loss" column does not need to be completed and calculations are not necessary.

Please copy this page as needed to document additional soil types and/or crop rotations.

SECTION 3: CROPLAND, HAYLAND, AND PASTURE BMPs

Summary of BMPs		
Field(s) #	**BMP**	**Date Implemented (or Scheduled Date for Proposed BMP)**

Note: If any dates listed above are for proposed BMPs and they are not implemented by that scheduled date, the Ag E&S Plan will need to be updated with the correct implementation date.

Please copy this page as needed to document additional BMPs.

BMP: _____

Description of BMP:

_____

_____

_____

_____

_____

Operation & Maintenance Information:

_____

_____

_____

_____

_____

Implementation Schedule:

Field #	Amount of BMP (acres, feet, number, etc., as applicable)	Date Implemented (or Scheduled Date for Proposed BMP)

Note: If any dates listed above are for proposed BMPs and they are not implemented by that scheduled date, the Ag E&S Plan will need to be updated with the correct implementation date.

Please copy this page as needed to document additional BMPs.

SECTION 4: FIELDS ALONG STREAMS AND RIVERS

Summary of BMPs		
Field(s) #	**BMP**	**Date Implemented (or Scheduled Date for Proposed BMP)**

Note: If any dates listed above are for proposed BMPs and they are not implemented by that scheduled date, the Ag E&S Plan will need to be updated with the correct implementation date.

Please copy this page as needed to document additional BMPs.

BMP: _____

Description of BMP:

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Operation & Maintenance Information:

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_____

_____

Implementation Schedule:

Field #	Amount of BMP (acres, feet, number, etc., as applicable)	Date Implemented (or Scheduled Date for Proposed BMP)

Note: If any dates listed above are for proposed BMPs and they are not implemented by that scheduled date, the Ag E&S Plan will need to be updated with the correct implementation date.

Please copy this page as needed to document additional BMPs.

SECTION 5: ANIMAL HEAVY USE AREAS

Summary of BMPs				
AHUA #	**Location of AHUA**	**Description/Size**	**BMP**	**Date Implemented (or Scheduled Date for Proposed BMP)**

Operators/landowners with AHUAs requiring both the development and implementation of BMPs need to immediately contact their local county conservation district and/or a commercial planner and must document that contact and the time frame for developing and implementing those practices. If operators with AHUAs are interested in evaluating all resource concerns and are willing to implement one or more conservation practices to address those resource concerns, you should contact NRCS.

If applicable, list date contact was made to the assisting agency/party to help in these efforts:

If applicable, list who was contacted to assist in these efforts:

Note: If any dates listed above are for proposed BMPs and they are not implemented by that scheduled date, the Ag E&S Plan will need to be updated with the correct implementation date.

Please copy this page as needed to document additional BMPs.

BMP: _____

Description of BMP:

_____

_____

_____

_____

Operation & Maintenance Information:

_____

_____

_____

_____

Implementation Schedule:

AHUA #	Amount of BMP (acres, feet, number, etc., as applicable)	Date Implemented (or Scheduled Date for Proposed BMP)

Note: If any dates listed above are for proposed BMPs and they are not implemented by that scheduled date, the Ag E&S Plan will need to be updated with the correct implementation date.

Please copy this page as needed to document additional BMPs.

APPENDIX A – EROSION AND SEDIMENT CONTROL REGULATIONS
25 Pa. Code §§ 102.1 and 102.4(a)
(Unofficial)

§ 102.1. Definitions.

The following words and terms, when used in this chapter, have the following meanings, unless the context clearly indicates otherwise:

ABACT – Antidegradation best available combination of technologies – Environmentally sound and cost effective treatment, land disposal, pollution prevention and stormwater reuse BMPs that individually or collectively manage the difference in the net change in stormwater volume, rate, and quality for storm events up to and including the 2-year/24-hour storm when compared to the stormwater rate, volume and quality prior to the earth disturbance activities to maintain and protect the existing quality of the receiving surface waters of this Commonwealth.

Accelerated erosion – The removal of the surface of the land through the combined action of human activities and the natural processes, at a rate greater than would occur because of the natural process alone.

Act 167 – The Storm Water Management Act (32 P.S. §§ 680.1 – 680.17)

Agricultural operation – The management and use of farming resources for production of crops, livestock, or poultry, or for equine activity.

Agricultural plowing or *tilling activity* –

(i) Earth disturbance activity involving the preparation and maintenance of soil for the production of agricultural crops.

(ii) The term includes no-till cropping methods, the practice of planting crops with minimal mechanical tillage.

Along – Touching or contiguous; to be in contact with; to abut upon.

Animal heavy use area –

(i) Barnyard, feedlot, loafing area, exercise lot, or other similar area on an agricultural operation where due to the concentration of animals it is not possible to establish and maintain vegetative cover of a density capable of minimizing accelerated erosion and sedimentation by usual planting methods.

(ii) The term does not include entrances, pathways, and walkways between areas where animals are housed or kept in concentration.

BMPs – Best management practices – Activities, facilities, measures, planning, or procedures used to minimize accelerated erosion and sedimentation and manage stormwater to protect, maintain, reclaim, and restore the quality of waters and the existing and designated uses of waters within this Commonwealth before, during, and after earth disturbance activities.

Channel – A natural or manmade water conveyance.

Conservation district – A conservation district, as defined in section 3(c) of the Conservation District Law (3 P.S. § 851(c)), which has the authority under a delegation agreement executed with the Department to administer and enforce all or a portion of the erosion, sediment, and stormwater management program in this Commonwealth.

Conservation plan – A plan that identifies conservation practices and includes site specific BMPs for agricultural plowing or tilling activities and animal heavy use areas.

Disturbed area – Unstabilized land area where an earth disturbance activity is occurring or has occurred.

Earth disturbance activity – A construction or other human activity which disturbs the surface of the land, including land clearing and grubbing, grading, excavations, embankments, land development, agricultural plowing or tilling, operation of animal heavy use areas, timber harvesting activities, road maintenance activities, oil and gas activities, well drilling, mineral extraction, and the moving, depositing, stockpiling, or storing of soil, rock, or earth materials.

Erosion – The natural process by which the surface of the land is worn away by water, wind, or chemical action.

E&S Permit – Erosion and Sediment Control Permit – A permit required for earth disturbance activities where the earth disturbance is associated with timber harvesting, road maintenance activities, or oil and gas activities.

E&S Plan – Erosion and Sediment Control Plan – A site-specific plan consisting of both drawings and a narrative that identifies BMPs to minimize accelerated erosion and sedimentation before, during and after earth disturbance activities.

Intermittent stream – A body of water flowing in a channel or bed composed primarily of substrates associated with flowing water, which, during periods of the year, is below the local water table and obtains its flow from both surface runoff and groundwater discharges.

Licensed professional – Professional engineers, landscape architects, geologists and land surveyors licensed to practice in this Commonwealth.

Long-term operation and maintenance – The routine inspection, maintenance, repair, or replacement of a BMP to ensure proper function for the duration of time that the BMP is needed.

Municipality – A county, city, borough, town, township, school district, institution or authority or another public body created by or pursuant to State law. For purposes of this definition, town includes an incorporated town.

NOI – Notice of Intent – A request, on a form provided by the Department, for coverage under a General NPDES Permit for Stormwater Discharges Associated With Construction Activities or an E&S Permit.

NPDES – National Pollutant Discharge Elimination System – The National system for the issuance of permits under section 402 of the Federal Clean Water Act (33 U.S.C.A. § 1342) including a state or

interstate program which has been approved in whole or in part by the EPA, including the regulations codified in Chapter 92 (relating to National Pollutant Discharge Elimination System permitting, monitoring and compliance), and as specified in this chapter.

NPDES Permit for Stormwater Discharges Associated With Construction Activities – A permit required for the discharge or potential discharge of stormwater into waters of this Commonwealth from construction activities, including clearing and grubbing, grading and excavation activities involving one acre (0.4 hectare) or more of earth disturbance activity or an earth disturbance activity on any portion, part, or during any stage of, a larger common plan of development or sale that involves one acre (0.4 hectare) or more of earth disturbance activity over the life of the project.

Nondischarge alternative – Environmentally sound and cost-effective BMPs that individually or collectively eliminate the net change in stormwater volume, rate, and quality for storm events up to and including the 2-year/24-hour storm when compared to the stormwater rate, volume, and quality prior to the earth disturbance activities to maintain and protect the existing quality of the receiving surface waters of this Commonwealth.

Normal pool elevation –

(i) For bodies of water which have no structural measures to regulate height of water, the height of water at ordinary stages of low water unaffected by drought.

(ii) For structurally regulated bodies of water, the elevation of the spillway, outlet control, or dam crest which maintains the body of water at a specified height.

(iii) The term does not apply to wetlands.

Notice of termination – A request, on a form provided by the Department, to terminate coverage under a General or Individual NPDES Permit for Stormwater Discharges Associated With Construction Activities or other permits under this chapter.

Oil and gas activities – Earth disturbance associated with oil and gas exploration, production, processing, or treatment operations or transmission facilities.

Operator – A person who has one or more of the following:

(i) Oversight responsibility of earth disturbance activity on a project site or a portion thereof who has the ability to make modifications to the E&S Plan, PCSM Plan or site specifications.

(ii) Day-to-day operational control over earth disturbance activity on a project site or a portion thereof to ensure compliance with the E&S Plan or PCSM Plan.

PCSM – Post construction stormwater management.

PCSM plan – A site-specific plan consisting of both drawings and a narrative that identifies BMPs to manage changes in stormwater runoff volume, rate and water quality after earth disturbance activities have ended and the project site is permanently stabilized.

PPC plan – Preparedness, Prevention and Contingency Plan – A written plan that identifies an emergency response program, material and waste inventory, spill and leak prevention and response, inspection program, housekeeping program, security, and external factors, and that is developed and implemented at the construction site to control potential discharges of pollutants other than sediment into waters of this Commonwealth.

Perennial stream – A body of water flowing in a channel or bed composed primarily of substrates associated with flowing waters and capable, in the absence of pollution or other manmade stream disturbances, of supporting a benthic macro-invertebrate community which is composed of two or more recognizable taxonomic groups of organisms which are large enough to be seen by the unaided eye and can be retained by a United States Standard No. 30 sieve (28 meshes per inch, 0.595 mm openings) and live at least part of their life cycles within or upon available substrates in a body of water or water transport system.

Perimeter BMPs – BMPs placed or constructed along the perimeter of an earth disturbance area to prevent runoff from entering the disturbed area, or to capture and treat sediment runoff prior to leaving a disturbed area.

Permanent stabilization – Long-term protection of soil and water resources from accelerated erosion.

Person – Any operator, individual, public or private corporation, partnership, association, municipality or political subdivision of this Commonwealth, institution, authority, firm, trust, estate, receiver, guardian, personal representative, successor, joint venture, joint stock company, fiduciary; Department, agency, or instrumentality of State, Federal or local government, or an agent or employee thereof; or any other legal entity.

Pollutant – Any contaminant or other alteration of the physical, chemical, biological, or radiological integrity of surface water which causes or has the potential to cause pollution as defined in section 1 of The Clean Streams Law (35 P. S. § 691.1).

Post construction stormwater – Stormwater associated with a project site after the earth disturbance activity has been completed and the project site is permanently stabilized.

Project site – The entire area of activity, development, lease, or sale including:

(i) The area of an earth disturbance activity.

(ii) The area planned for an earth disturbance activity.

(iii) Other areas which are not subject to an earth disturbance activity.

Riparian buffer – A BMP that is an area of permanent vegetation along surface waters.

Riparian forest buffer – A type of riparian buffer that consists of permanent vegetation that is predominantly native trees, shrubs and forbs along surface waters that is maintained in a natural state or sustainably managed to protect and enhance water quality, stabilize stream channels and banks, and separate land use activities from surface waters.

Road maintenance activities –

(i) Earth disturbance activities within the existing road cross-section or railroad right-of-way including the following:

(A) Shaping or restabilizing unpaved roads.

(B) Shoulder grading.

(C) Slope stabilization.

(D) Cutting of existing cut slopes.

(E) Inlet and endwall cleaning.

(F) Reshaping and cleaning drainage ditches and swales.

(G) Pipe cleaning.

(H) Pipe replacement.

(I) Support activities incidental to resurfacing activities such as minor vertical adjustment to meet grade of resurfaced area.

(J) Ballast cleaning.

(K) Laying additional ballast.

(L) Replacing ballast, ties, and rails.

(M) Other similar activities.

(ii) The existing road cross-section consists of the original graded area between the existing toes of fill slopes and tops of cut slopes on either side of the road and any associated drainage features.

Sediment – Soils or other erodible materials transported by stormwater as a product of erosion.

Sedimentation – The action or process of forming or depositing sediment in waters of this Commonwealth.

Soil loss tolerance (T) – The maximum amount of soil loss, in tons/acre/year, that a given soil type can tolerate and still permit a high level of crop production to be sustained economically and indefinitely. T values for various soil types may be obtained from the *Pennsylvania Soil and Water Conservation Technical Guide,* USDA NRCS, 1991 (as amended and updated).

Stabilization – The proper placing, grading, constructing, reinforcing, lining, and covering of soil, rock, or earth to ensure their resistance to erosion, sliding or other movement.

Stormwater – Runoff from precipitation, snowmelt, surface runoff and drainage.

Surface waters – Perennial and intermittent streams, rivers, lakes, reservoirs, ponds, wetlands, springs, natural seeps, and estuaries, excluding water at facilities approved for wastewater treatment such as wastewater treatment impoundments, cooling water ponds, and constructed wetlands used as part of a wastewater treatment process.

Timber harvesting activities – Earth disturbance activities including the construction of skid trails, logging roads, landing areas and other similar logging or silvicultural practices.

Top of streambank – First substantial break in slope between the edge of the bed of the stream and the surrounding terrain. The top of streambank can either be a natural or constructed (that is, road or railroad grade) feature, lying generally parallel to the watercourse.

Waters of this Commonwealth – Rivers, streams, creeks, rivulets, impoundments, ditches, watercourses, storm sewers, lakes, dammed water, wetlands, ponds, springs and other bodies or channels of conveyance of surface and underground water, or parts thereof, whether natural or artificial, within or on the boundaries of this Commonwealth.

§ 102.4. Erosion and sediment control requirements.

(a) For agricultural plowing or tilling activities or for animal heavy use areas, the following erosion and sediment control requirements apply:

(1) The implementation and maintenance of erosion and sediment control BMPs are required to minimize the potential for accelerated erosion and sedimentation, including for those activities which disturb less than 5,000 square feet (464.5 square meters).

(2) Written E&S Plans are required for the following activities that disturb 5,000 square feet (464.5 square meters) or more of land:

(i) Agricultural plowing or tilling activities.

(ii) Animal heavy use areas.

(3) The landowner, and any lessee, renter, tenant, or other land occupier, conducting or planning to conduct agricultural plowing or tilling activities, or operating an animal heavy use area, are jointly and individually responsible for developing a written E&S Plan and implementing and maintaining BMPs, including those identified in the E&S Plan.

(4) The E&S Plan must include cost-effective and reasonable BMPs designed to minimize the potential for accelerated erosion and sedimentation from agricultural plowing or tilling activities and animal heavy use areas.

(i) For agricultural plowing or tilling activities, the E&S Plan must, at a minimum, limit soil loss from accelerated erosion to the soil loss tolerance (T) over the planned crop rotation.

(ii) For agricultural plowing and tilling activities that will occur on fields with less than 25% plant cover or crop residue cover and within 100 feet of a river, or perennial or intermittent

stream, additional BMPs shall be implemented to minimize accelerated erosion and sedimentation.

(iii) For animal heavy use areas, the E&S Plan must identify BMPs to minimize accelerated erosion and sedimentation. BMPs and their design standards are listed in the current amended and updated version of the appropriate National Resources Conservation Service conservation practice standards such as Heavy Use Area Protection, Critical Area Planting, Fencing, Wastewater Treatment Strip, Constructed Wetland, Use Exclusion, Animal Trails and Walkways, Diversions and Roof Runoff Structure.

(5) The E&S Plan must contain plan maps that show the location of features including surface waters of this Commonwealth, and drainage patterns, field and property boundaries, buildings and farm structures, animal heavy use areas, roads and crossroads, and BMPs; soils maps; and a description of BMPs including animal heavy use area practices and procedures, tillage systems, schedules, and crop rotations. The plan must be consistent with the current conditions and activities on the agricultural operation.

(6) The E&S Plan must contain an implementation schedule. The plan shall be implemented according to the schedule, and the BMPs shall be operated and maintained as long as there are agricultural plowing or tilling activities or animal heavy use areas, on the agricultural operation.

(7) The portion of a conservation plan that identifies BMPs utilized to minimize accelerated erosion and sedimentation from agricultural plowing or tilling activities, or from operation of animal heavy use areas, may be used to satisfy the E&S Plan requirements of this subsection if it meets the requirements of paragraphs (4) – (6).

(8) The E&S Plan shall be available for review and inspection at the agricultural operation.

(9) Nothing in this section negates the requirements under other provisions of this chapter, such as those applicable to construction activities.

APPENDIX B – PLANNING GUIDANCE TO MEET TOLERABLE SOIL LOSS (T)

Note: If your operation has observable gully or rill erosion OR crop residues are removed, this guidance does not apply. This guidance may be used as a starting point when developing a written plan to meet T over a crop rotation without professional assistance. These scenarios will minimize erosion on **typical** soil and slope conditions with **average** county rainfall and yields. **Following this guidance may or may not reduce erosion below T due to local farm-specific conditions and erosion may still be occurring**. Less intensive tillage practices than those listed are preferable and will further reduce erosion. Assistance is available from your local county conservation district and/or a commercial planner. If you would like to evaluate all resource concerns on your operation, contact the Natural Resources Conservation Service (NRCS). **This guidance will be null and void if used when it is not appropriate, requiring submission of calculations for the Predicted Average Annual Soil Loss**.

Observable rill erosion, small channels in soil that form randomly on a slope, indicate erosion rates of six to seven tons/acre. When rill erosion is observed, adjust the plan and management to lower erosion. Rills are usually less than four inches deep but are typically about an inch deep and an inch wide.

Considerations that will lower erosion:

- Use cover crops; plant early enough to allow vigorous establishment before temperatures drop.
- Eliminate all conditions that lead to the formation of seasonal (ephemeral) and permanent gully erosion. You may contact your local county conservation district, NRCS, and/or a commercial planner for additional guidance.
- Reduce tillage intensity (frequency, depth, level of disturbance) and use no-till to lower erosion.
- After 7 years, permanent no-till decreases soil erosivity by about 50% compared to tilled soil. Any tillage at all will erase this benefit.
- Aim to have a minimum of 35% crop residue cover on the soil surface all months of the year.
- Plant an alfalfa/grass mixture instead of pure alfalfa to reduce erosion.
- If corn grain or soybean crop residue is baled, select a cover crop variety that will mature early enough to allow establishment of a winter small grain or cover crop.
- Split fields with longer slopes mid-slope along the contour, then plant sediment susceptible crops (such as corn silage or soybeans) with sediment resistant crops (such as hay) alternately in the strips.
- Plant a permanent 15-foot strip of grass mid-slope on the contour to lower erosion.
- Lengthen the years of hay in rotation to lower erosion.
- Soil test and follow the recommendations.
- When double cropping soybeans, no-till into small grain stubble to increase residue/reduce erosion.
- Plant crops within optimum planting dates.
- Manage cover crops as well as main crops; consider using a multi-species cover crop.

Common Crop/Forage Rotations and Tillage Practices that would meet the tolerable soil loss if T=3. They may be utilized for T values of 3, 4, and 5 tons/acre/year.

Slope	Rotation Cycle	Crop Rotation	Tillage Practice*
A (0 – 3%)	2 years	1st year: Corn Grain 2nd year: Soybeans	All Spring or Fall Chisel
B (3 – 8%)	2 years	1st year: Corn Grain 2nd year: Soybeans	All No-Till
	3 years	1st year: Corn Grain 2nd year: Short Season Corn Grain & Wheat 3rd year: Double Crop Soybeans	1st year: Spring Chisel 2nd year: Spring Chisel Followed by Fall Chisel 3rd year: Summer Chisel
C (8 – 15%)	3 years	1st year: Corn Grain 2nd year: Short Season Corn Grain & Wheat 3rd year: Double Crop Soybeans	1st year: No-Till 2nd year: Spring Chisel Followed by Fall Chisel 3rd year: No-Till
	2 years	1st year: Short Season Corn Grain & Wheat 2nd year: Double Crop Soybeans	1st year: No-Till Followed by Fall Chisel 2nd year: No-Till
	2 years	1st year: Corn Grain 2nd year: Soybeans	All No-Till

*This guidance may be utilized when less erosive tillage practices than what is listed are used.

Slope	Rotation Cycle	Forage Rotation	Tillage Practice*
A (0 – 3%)	8 years	1st – 4th years: Alfalfa Seeding	Spring Moldboard Plow
		5th – 6th years: Corn grain	Spring Chisel
		7th – 8th years: Corn Silage & Rye Cover Crop	Corn: Spring Chisel Rye: No-Till
	8 years	1st – 4th years: Alfalfa Seeding	Spring Moldboard Plow
		5th – 8th years: Corn Silage & Rye Cover Crop	All No-Till
B (3 – 8%)	8 years	1st – 4th years: Alfalfa Seeding	No-Till
		5th – 8th years: Corn Silage & Rye Cover Crop	Corn: No-Till Rye: No-Till
	6 years	1st – 4th years: Alfalfa/Grass & Small Grain Cover Crop	Fall Moldboard Plow, Fall Planted
		5th year: Short Season Corn & Rye Cover Crop	Corn: Spring Chisel Rye: Disk Till
		6th year: Corn Silage & Rye Cover Crop	Corn: Spring Chisel Rye: Disk Till
		Permanent Contour Buffer Strip Mid-Slope (15-foot Cool Season Grass)	N/A
C (8 – 15%)	5 years	1st – 3rd years: Orchardgrass Seeding	Fall Disking, Fall Planting
		4th – 5th years: Corn Silage & Wheat Grain	All No-Till

*This guidance may be utilized when less erosive tillage practices than what is listed are used.

APPENDIX C – OTHER ENVIRONMENTAL REQUIREMENTS AND PROGRAMS

Note: This is not a comprehensive listing, as there may be other requests, requirements, or approvals applicable to a specific situation.

National Pollutant Discharge Elimination Systems (NPDES) Concentrated Animal Feeding Operation (CAFO)

If an operation meets the definition of a CAFO and is an agricultural operation that is required to have an Agricultural Erosion & Sediment Control Plan (Ag E&S Plan), the operation must have an Ag E&S Plan and be on schedule for implementation to meet the NPDES CAFO permit requirements. More information regarding CAFO status can be found on the Pennsylvania Department of Environmental Protection (Department's) Bureau of Clean Water, Concentrated Animal Feeding Operation website.

Chapter 83, Subpart D. Nutrient Management and 25 Pa. Code § 91.36(b) Manure Management

If an operation meets the definition of a Concentrated Animal Operation (CAO) with a threshold of 2.0 Animal Equivalent Units (AEU) per acre suitable for manure application, a current Ag E&S Plan is required for the Nutrient Management Plan (NMP) to be approved under the Nutrient Management and Odor Management Act (Act 38, P.L. 112, No. 38) (3 P.S. §§ 1701-1718). The State Conservation Commission (SCC) or delegated county conservation district will verify that a current Ag E&S Plan is written for the operation and the NMP and Ag E&S Plan do not contradict each other. More information regarding CAO status and AEU calculations can be found in the *Penn State Agronomy Fact Sheet 54*.

The term "current" refers to the crop rotations and tillage practices currently employed on the operation. It is critically important that the Ag E&S Plan and the NMP or Manure Management Plan (MMP) under 25 Pa. Code § 91.36(b), whichever is applicable, are consistent and complement each other. Having two separate plans that do not relate only serves to confuse the operator/landowner and additionally make the operator/landowner out of compliance with either Act 38 or 25 Pa. Code Chapters 91, 92 or 102.

While NMPs must be reviewed and approved by the SCC or delegated county conservation district, there is no required review and approval process for Chapter 91 MMPs. For both types of nutrient management plans (NMPs and MMPs), the E&S Plan management decisions should be consistent with the management decisions for the nutrient/manure plans.

Section 102.4(a) requires the operator and landowner to have the E&S Plan readily available for review and inspection.

More information on how these plans are related may be found on the Pennsylvania Nutrient Management Program website in a document entitled *The Most Common Agricultural Operation Plans and their Objectives and Differences*.

Farmland Preservation

Agricultural operations seeking to be preserved through the Pennsylvania State Farmland Preservation program, or which have been preserved, must have and be on schedule to implement a Natural Resources Conservation Service (NRCS) Conservation Plan that describes land management practices which, when implemented, will improve and maintain soil, water, and related plant and animal

resources. Please refer to 7 Pa. Code § 138e.222 for requirements of conservation plans specific to the Pennsylvania State Farmland Preservation program. Additionally, they must have an NMP if required by the Nutrient Management Act (3 P.S. §§ 1701—1718). If an NMP is not required under the Nutrient Management Act, the nutrient management component (NRCS Practice Code 590) of the conservation plan shall consist of a description of the amounts and types of nutrients generated on the farmland tract and a description of any current and planned measures or procedures for containment, use, disposal, or other disposition of the nutrients described.

All agricultural operations on the land must be conducted in accordance with an appropriate NRCS Conservation Plan. For operations where federal funds from the United States Department of Agriculture (USDA) help supplement the state funds for ag land preservation, an NRCS Conservation Plan is required. The NRCS Conservation Plan must also meet state regulatory requirements, as cited in Section 102.4(a) and described above.

Resource Enhancement and Protection (REAP) Program

Through the Resource Enhancement and Protection (REAP) Program, operators, landowners, and businesses earn tax credits for implementing Best Management Practices (BMPs) that will enhance farm production and protect natural resources. The program is administered by the SCC and the tax credits are awarded by the Pennsylvania Department of Revenue. Agricultural operations must have a current and up-to-date NRCS Conservation Plan or Ag E&S Plan on all acres that are under managerial control at the time of application. The operation must also have a current and up-to-date NMP (for a CAO or CAFO) or MMP (required of all operations that have animals or utilize manure). The written plans must be on-schedule for full implementation to be considered current. The cost of developing and implementing these plans may be included to qualify for the tax credit. BMPs necessary to control nutrient and sediment runoff from Animal Heavy Use Areas (AHUAs) must be fully implemented or the implementation of these BMPs must be included in the application, or both. The operation must be on-schedule for full implementation of crop field and other nutrient management BMPs. An agricultural operation with BMPs that are not yet implemented and are required in an Ag E&S/NRCS Conservation Plan and/or an NMP/MMP must be following the schedule for full implementation listed in those plans. More information can be found on the REAP website.

USDA – NRCS Program Requirements

To meet the requirements of Chapter 102, agricultural operations may utilize an NRCS Conservation Plan, which is developed to meet federal requirements and guidelines. An NRCS Conservation Plan is not synonymous with a state-required Ag E&S Plan but, if requested from your local NRCS Certified Conservation Planner, can serve as your Ag E&S Plan if it meets all the requirements of 25 Pa. Code § 102.4(a). Additionally, the Department is the regulatory authority that determines if the NRCS Conservation Plan satisfies the Department's regulatory requirements of an Ag E&S Plan.

Typically, NRCS Conservation Plans are developed for farmers and producers by NRCS Certified Conservation Planners working at USDA-NRCS offices or county conservation districts. NRCS Conservation Plans must meet all USDA-NRCS planning requirements and be signed by an individual with current NRCS Certified Conservation Planner designation. NRCS Conservation Plans may also be used to meet the conservation plan requirements of Farmland Preservation (see Farmland Preservation) or federal financial assistance programs such as Environmental Quality Incentives Program (EQIP), Conservation Stewardship Program (CSP), Conservation Reserve Enhancement Program (CREP), Food Security Act, etc.

Construction E&S

An Ag E&S Plan is required for all operations performing earth disturbance activities related to plowing, tilling (including no-till) or AHUAs totaling 5,000 or more square feet. This includes any associated timber harvesting. The plan should always be available, updated as needed, and implemented by the operator/landowner. Since the erosion and sedimentation related to these activities are considered ongoing, particularly sheet and rill erosion from crop fields, the Ag E&S Plan includes appropriate management and/or structural BMPs that are generally permanent (or require ongoing operation and management) in nature.

An Ag E&S Plan does not cover construction activities; therefore, if a person is looking to commence construction on an agricultural operation, a Construction E&S Plan and, depending upon the acres disturbed, an NPDES permit may be necessary.

New construction requires erosion and sedimentation control BMPs and may require a Construction E&S Plan under 25 Pa. Code Section 102.4(b). Typical elements of an E&S Plan for these types of activities may include temporary diversions to channel upslope runoff around the disturbed site and sediment removal devices (silt fence or filter sock, sediment trap or basin) to treat the sediment-laden runoff downslope of the site. The Construction E&S Plan must be onsite and available for inspection during all times of construction. Details and descriptions for erosion and sedimentation control measures are found in the Department's *Erosion and Sediment Pollution Control Program Manual*. For more information relating to construction on agricultural operations, contact your local county conservation district or the Department.

Clearing and Grubbing for Conversion to Agriculture

All phases of agricultural land clearing projects for new cropland and/or pastures should be addressed through the agricultural erosion and sediment control requirements in 25 Pa. Code § 102.4(a). This includes having written plans for the timber harvest component (if applicable); the clearing and grubbing component; and the continued cultivation of the field. All phases of the project should have the appropriate BMPs to minimize the potential for accelerated erosion and sedimentation. For the first two phases (timber harvest and clearing/grubbing), these would not be the traditional agricultural conservation BMPs, but would be those specific to timber harvest and construction activities. Practices utilized for timber harvest and construction activities are found in the Department's *Erosion and Sediment Pollution Control Program Manual*.

Agricultural land clearing projects for other purposes, such as construction of new animal housing, require an E&S Plan and potentially an NPDES permit if the activity exceeds one acre of earth disturbance.

APPENDIX D – OTHER SOURCES OF ASSISTANCE

Note: The websites listed below are subject to change.

1. **Pennsylvania Department of Environmental Protection.**
   Please refer to this website, https://www.dep.pa.gov/Pages/default.aspx, for regional contact information.

   Bureau of Clean Water
   P.O. Box 8774
   Harrisburg, PA 17105-8774
   717-787-6744

2. **United States Department of Agriculture (USDA) – Natural Resources Conservation Service (NRCS).**
   https://www.nrcs.usda.gov/wps/portal/nrcs/site/pa/home/

3. **Local County Conservation Districts.**
   Please refer to this website, https://pacd.org/?page_id=59, for the most up-to-date contact information.

4. **USDA-NRCS Web Soil Survey for Pennsylvania.**
   https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

5. **PAOneStop Farm Mapping and E&S Planning System.**
   https://www.paonestop.org

6. **Pennsylvania NRCS Field Office Technical Guide.**
   https://efotg.sc.egov.usda.gov/

7. **USDA-NRCS "Farming with Crop Residues" Brochure**. This is a helpful tool to aid in visually assessing the percentage of residue on crop fields.
   https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs141p2_029000.pdf

8. **Erosion and Sediment Pollution Control Program Manual. March 2012.** Check with your local county conservation district for availability or refer to www.dep.pa.gov and search for "363-2134-008" (the guidance document number) using the search tool.
   http://www.depgreenport.state.pa.us/elibrary/GetDocument?docId=7700&DocName=363-2134-008.pdf

9. **A Conservation Catalog: Practices for Conserving Pennsylvania's Natural Resources. USDA-NRCS, February 2013.** Features soil-saving practices which are based on improving soil health, establishing and maintaining permanent cover, and controlling the flow of water. The catalog is a cooperative effort of the Pennsylvania Conservation Partnership. It explains how each practice works, gives tips on installing or managing practices, and suggests how the practices may be combined with others for soil and water conservation systems. Available from county conservation districts or online at:
   https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1101559.pdf

10. **The Agronomy Guide.**
https://extension.psu.edu/the-penn-state-agronomy-guide

11. **The Nutrient Management Act Program Technical Manual.**
https://extension.psu.edu/programs/nutrient-management/planning-resources/alternative-tech-manual/nutrient-management-technical-manual/view

12. **National Engineering Handbook (NEH) Part 650 – Engineering Field Handbook.**
https://directives.sc.egov.usda.gov/viewerFS.aspx?hid=21429

13. **The State Conservation Commission.**
http://www.agriculture.pa.gov/Plants_Land_Water/StateConservationCommission/Pages/default.aspx

14. **The Penn State University, College of Agricultural Science & Penn State Cooperative Extension.**
http://agsci.psu.edu/