



# AEM Tier 2 Worksheet

## Soil Management

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### Glossary

**Acceptable Soil Loss:** An estimate of the maximum annual rate of soil erosion that can occur over a sustained period, without affecting crop productivity. The rate is expressed in tons ("T") of soil loss per acre per year. Generally, rates of 1 through 5 are found, depending on soil properties. See the County Soil Survey for "T" factors for a specific soil type.

**Comprehensive Nutrient Management Plan (CNMP):** A grouping of conservation practices and management activities which, when implemented as part of a conservation management system, will help to ensure that both production and natural resource protection goals are achieved. It addresses natural resource concerns; including soil erosion, manure, and organic by-products (and their potential impacts on water quality); that may derive from an animal feeding operation.

**Ephemeral Erosion:** Small rills that concentrate into a defined channel, which are often removed by tillage operations.

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### Background

Effective management of the soils on a farm is a key component to the profitability of the enterprise and the impact the operation has on our environment. Soil erosion can carry sediments, nutrients and pesticides to surface water bodies, degrading water quality. At the same time, soil erosion removes organic matter, nutrients, and topsoil, decreasing soil fertility, tilth, and water holding capacity. In turn, this causes reduced crop growth and inefficient use of crop inputs. Sediment from erosion fills drainage ditches, road ditches, culverts, stream channels, and shortens the life of lakes, reservoirs, and ponds. Protecting soil from compaction can enhance water availability to crops and root growth, resulting in increased yields and less runoff.

Preventing erosion and enhancing soil quality should be a priority on every farm. It makes good economic and environmental sense. A systems approach to soil conservation provides multiple barriers against soil erosion and water quality degradation. Crop rotations, strip cropping, conservation tillage, and cover crops help protect soil from erosion by wind and water and help maintain or increase soil organic matter. Soil organic matter improves soil tilth, reduces susceptibility to compaction, increases nutrient and water holding capacity, slows the movement of pesticides through the soil, and can protect against erosion. Diversions, waterways, and terraces capture and provide stable outlets for runoff. Vegetative filter strips and riparian forest buffers capture sediment and nutrients attached to sediments, and also pesticides, before they reach watercourses.

### Agricultural Water Quality Principle:

Soil on agricultural operations should be managed to improve soil quality and protect against erosion for minimum transport and deposition of sediment in surface waters.

## Glossary Continued...

**Filter strip:** A strip of vigorous dense sod (meeting NRCS Standard NY-393s) for removing sediment, organic matter, and other pollutants from runoff from crop fields.

**Food Security Act (FSA) Plan:** A grouping of conservation practices and management activities to be implemented on Highly Erodible Land (HEL) in agricultural production as directed by the Food Security Act of 1985 (Public Law 99-198). This planning system addresses HEL fields on a farm and focuses on sheet and rill soil erosion.

**Gully Erosion:** Gullies are channels too deep for normal tillage operations to erase. They may grow or enlarge from year to year by head-cutting and lateral widening. Gullies usually occur in depressions and natural drainage ways.

**Highly Erodible Land (HEL):** Land that has a soil Erodibility Index (EI) of 8 or greater as defined by the Food Security Act of 1985 (Public Law 99-198). The soil EI is determined by multiplying the R, K and LS factors from the Universal Soil Loss Equation (USLE) for a specific field, then dividing the result by the USLE "T" factor for the specific soil type. The result is the EI.

**Rills:** Small gullies, generally less than 4 inches deep, that appear at different locations on the landscape from year to year. Deposition of sediment usually occurs at the end of a rill.

**Sheet and Rill Erosion:** A type of soil erosion that occurs when soil is removed by water more or less uniformly from every part of the slope of a field. This type of erosion is often accompanied by the formation of irregularly-dispersed rills.

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**Tilth:** The physical condition of soil as related to its ease of tillage, fitness as a seedbed, and its impedance to seedling emergence and root penetration.

**Universal Soil-Loss Equation (USLE):** An equation that estimates the amount of soil lost to sheet and rill erosion from an acre of land in a year's time. The computed soil loss is the product of the following factors measured in tons/acre/year:  $A=RKLSCP$ ; where R is rainfall, K is soil erodibility, L is length of slope, S is slope gradient, C is vegetative management), and P is erosion control practice. See the NRCS Technical Guide for a plantation of the equation and its factors.

**Waterbody:** A lake, reservoir, pond, river, continuously-flowing stream, continuously-flowing spring, wetland, estuary or bay.

**Watercourse:** Water flowing over a non-vegetated channel to a water body.

**Whole Farm Plan:** A grouping of conservation practices and management activities which, when implemented as part of a conservation management system, will help ensure that both production and natural resource protection goals are achieved. It addresses all natural resource concerns, including soil, water, air, plants, animals, and human considerations.

AEM Tier 2 Worksheet: Soil Management		Potential Concern			
Factors Needing Assessment:	Lower 1	2	3	Higher 4	
Is ephemeral and/or gully erosion occurring on the farm?	There is no gully or ephemeral erosion occurring on the farm.	There is ephemeral erosion occurring on some fields. <b>AND</b> There is no gully erosion occurring on the farm. <b>AND</b> Dense sod prevents the sediment from entering a watercourse.	There is evidence of both ephemeral and some minor gully erosion taking place.	There is evidence of both ephemeral and gully erosion taking place.	
Is there a plan in place, such as an FSA plan or a Comprehensive Nutrient Management Plan (CNMP), to control erosion?	There is a whole farm plan or CNMP in place that controls erosion to a level of "T" or less. <b>AND</b> The producer follows the plan and keeps it up-to-date.	There is an FSA plan in place which is being followed on all Highly Erodible Land (HEL) fields. <b>OR</b> There are no HEL fields on the farm.		There is no plan in place addressing erosion. <b>OR</b> A plan is in place that is largely ignored.	
Does sediment from crop fields reach a watercourse?	There is no evidence of ephemeral, gully, or sheet and rill erosion occurring on the farm.	The length of flow through vigorous vegetation (filter strip) is at least 20 ft. for slopes less than 1% and increases by 1.5 ft. of flow length for each percent of slope increase, as per NRCS Standard 393s.	Some filter strips meeting Standard 393s are in place. <b>OR</b> Filter strips are in place, but they do not meet NRCS Standard 393s.	No filter strips are in place. <b>OR</b> Sediment is directly entering a watercourse.	

## **Other**

1. Is there evidence of sediment deposition on the farm?
2. Is wind erosion occurring?
3. What are the crop rotations used on the farm?
4. What type of tillage operations are used on the farm?
5. Does soil compaction limit the growth or selection of crops?
6. Is soil organic matter content maintained and enhanced by using proper manure applications, crop rotations, cover crops, and harvesting operations that leave crop residues in the field?
7. Are there subsurface drainage concerns on the farm?
8. Are cover crops used on the farm?

## **Additional Comments**