

RESOURCE QUALITY CRITERIA SOIL

The soil resource is the basic resource which must be protected, maintained, and/or improved for sustained agriculture use and the protection of water, air, plant, and animal resources.

The soil resource considerations are erosion, condition, deposition, and protection.

Soil erosion quality criteria is established for the following types of erosion: sheet and rill, wind, concentrated flow (ephemeral gully and classic gully), irrigation-induced, streambank, soil mass movement (land slips or slides), road bank, construction sites, and shoreline. All of these forms of erosion that are identified on the site to be planned that do not meet the criteria need to be addressed during the planning process. In treating sheet and rill, wind or irrigation induced erosion, quality criteria is met when the treatment reduces erosion levels to tolerance levels for the soil. Tolerance levels will be considered met when the erosion rates do not exceed $T + 1$ or 125% of the T value, whichever is greater.

Soil condition quality criteria is established for soil tilth, soil compaction, and soil contamination. Soil tilth considers the chemical and physical characteristics of the soil as related to its ease of tillage, fitness as a seedbed, and its ability to absorb, store, and release water and nutrients for plants while reducing compaction and crusting, optimizing water infiltration and soil organic material, enhancing beneficial soil organisms and biological activity, and reducing subsidence. Criteria is also established for soil contamination from excess natural or applied chemicals, and excess application of nutrients, pesticides, animal wastes, and other organics.

Soil deposition quality criteria is established for onsite or offsite deposits of the products of erosion, including sediment, that cause damage to crops, land, and property (structures and machinery). Criteria also is established for safety hazards and decreased long-term productivity from soil deposits.

Achieving quality criteria for the soil resource will ensure:

- Protection from excessive erosion,
- Productivity consistent with the land user's objectives and sustainability requirements,
- Protection from harmful effects of soil contamination,
- Reduction of onsite or offsite excessive soil deposits,
- Protection of endangered or threatened plants and habitat for endangered or threatened animals.

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SOIL	Erosion – Sheet and Rill Soil erosion caused by overland flow.	Criteria is met when the planned measures reduce estimated sheet and rill erosion rates to tolerance levels for the soil.
SOIL	Erosion – Wind Soil erosion caused by wind energy.	Criteria is met when the planned measures reduce estimated wind erosion rates to tolerance levels for the soil.
SOIL	Erosion – Concentrated Flow Ephemeral Gullies - Soil erosion caused by concentrated flow channels along depressional water-courses (ephemeral gully concentrated flow).	Criteria is met when the planned measures stabilize flow channels.
SOIL	Erosion – Concentrated Flow Classic Gullies – Soil erosion caused by channels that grow from year-to-year by headcutting, widening and/or deepening.	Criteria is met when the planned measures limit erosion by stabilizing channel bottoms and gully sidewalls or if the decision-maker cannot practically treat the problem, the criteria is met when the planned actions are not adversely contributing to the gully problem.
SOIL	Erosion – Irrigation Induced - Erosion caused by excessive amounts and/or velocities of irrigation water.	Criteria is met when the planned amount and velocity of applied irrigation water is not causing erosion above soil tolerance levels and Irrigation Water Management is planned.
SOIL	Erosion – Scoured Areas - Soil erosion caused by watercourse overflow.	Criteria is met when the planned measures provide temporary or permanent vegetation consistent with flow velocities to provide protection from scouring.

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SOIL	Erosion – Construction Sites - Soil erosion caused by construction activities.	Criteria is met when the planned measures provide vegetative or other protection, adequate water disposal, and sediment control.
SOIL	Erosion – Streambank Channel Sloughing of banks caused by stream flow, overbank flow, unstable soils, or unstable channel bottoms.	Criteria is met when the planned measures stabilize streambanks, or if the problem cannot feasibly be treated by the decisionmaker, criteria will be met when the planned actions are not adversely contributing to the streambank erosion.
SOIL	Erosion – Soil Mass Movement - Soil movement caused by soil slippage, landslides, or slope failures.	Criteria is met when the planned measures minimize soil mass movement at a rate not exceeding normal geological processes, or if the problem cannot feasibly be treated by the decisionmaker, criteria will be met when the planned actions are not adversely contributing to the problem.
SOIL	Erosion – Roadbanks Soil erosion caused by unstable slopes or banks or soil erosion caused by concentrated flow in roadbanks.	Criteria is met when the planned measures include slope shaping to acceptable grades, bank stabilization, and the safe conveyance of overland and channel flow.
SOIL	Erosion – Shoreline Soil erosion caused by unstable slopes or a lack of protective cover vegetation along shorelines.	Criteria is met when the planned measures include construction of temporary barriers, planting adapted vegetation and/or construction of permanent structures to dissipate or reflect wave energy.

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SOIL	Condition – Soil Tilth Unsuitable soil tilth resulting in crusting, Unfavorable water infiltration, or inadequate organic material.	<p>Criteria is land use specific:</p> <p><u>Cropland</u> – Criteria is met when the soil condition does not impair the growth and vigor of the plant species of concern and Conservation Crop Rotation and Residue Use (or Residue Management No-till & Strip Till, Residue Management Mulch Till and Residue Management Ridge Till) is planned.</p> <p><u>Pastureland – Hayland</u> – Criteria is met when the soil condition does not impair the growth and vigor of the plant species of concern and Prescribed Grazing or Forage Harvest Management is planned.</p> <p><u>Rangeland</u> – Criteria is met when the rangeland is suitable to protect the resource base, range trend is stable, and Prescribed Grazing is planned. For seeded rangeland, criteria is met when the seeded and/or desired species constitutes at least 75% of the total vegetative production, or at least 75% of the production potential for the site and Prescribed Grazing is planned.</p> <p><u>Forestland</u> – Criteria is met when the forest stand is protected against destructive grazing and fire and the resource base is being maintained.</p>

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		<u>Other Land Uses</u> – Criteria is met when the soil cover is maintained to keep erosion levels to acceptable limits and infiltration is not impaired.
SOIL	Condition – Compaction Plant-soil-air-moisture relationship is adversely affected by excess compressing of soil particles or aggregates.	Criteria is met when the measures reduce compaction to a point that does not impair the growth and vigor of the desired plant species of concern.
SOIL	Condition – Soil Contaminants – Salinity or Heavy Metals – Soil has an excessive salinity level or heavy metals content which restricts the use of the plant species of concern.	Criteria is met when the planned measures adjust the levels of salinity and/or heavy metals to tolerance levels of the existing plants, or provide for a land use or species change tolerant to present salinity and/or heavy metal contents.
SOIL	Condition – Soil Contaminants – Animal Wastes and Other Organics Soil has excess animal wastes or other organics which restricts the use of the plant species of concern.	Criteria is met when the planned measures reduce contaminants to levels that do not adversely affect other resources or restrict the use of the plant species of concern, and Waste Utilization and Nutrient Management are planned when animal waste is applied.
SOIL	Condition – Soil Contaminants – Fertilizer Soil has excess levels of fertilizer elements which restrict a suitable use.	Criteria is met when the planned measures reduce fertilizer elements to levels that do not restrict plant usage, and Nutrient Management is planned when fertilizers are to be applied.

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SOIL	Condition – Soil Contaminants – Pesticides Soil has excess levels of pesticides which restrict a suitable use.	Criteria is met when the planned measures reduce pesticides to levels that do not adversely affect other resources or restrict the use of the land, and Pest Management, Brush Management and/or Forest Stand Improvement is planned when pesticides are to be applied.
SOIL	Deposition – Onsite Damage - Soil deposition which causes onsite damage or management problems to property, vegetation, or surface soil.	Criteria is met when the planned measures eliminate the adverse contribution to the deposition problem by providing erosion control on the treatment unit.
SOIL	Deposition – Offsite Damage - Offsite soil deposition causing damage or management problems to property, vegetation or surface soil.	Criteria is met when the planned measures provide erosion control to eliminate contribution to the offsite deposition problem.
SOIL	Deposition – Onsite Safety - Soil deposition on roads and railroads causing safety problems onsite.	Criteria is met when the planned measures eliminate the deposition safety hazard by providing erosion control on the treatment unit.
SOIL	Deposition – Offsite Safety - Soil deposition on roads and railroads causing safety problems offsite.	Criteria is met when the planned measures provide erosion control to eliminate contribution to the offsite safety problems.

RESOURCE QUALITY CRITERIA WATER

Water as a resource includes surface water, ground water, and natural rainfall. Considerations for the water resource are water quantity, water quality, and water protection.

Water quantity criteria is established for the disposal and/or management of excess water resulting from natural or man made seeps, overland flows, or water accumulations on the soil surface or in soil profiles within policy and laws regarding wetlands. Criteria is also established for the management of water resulting from inadequate outlets. Criteria also is established for the optimization of water for irrigation and the management of precipitation to minimize water loss to runoff and evaporation, induce positive effects on plant-soil-moisture relationship, increase ground water recharge, increase downstream water yield, and manage water for wetland protection. Additional criteria is established for sediment deposits which restrict capacity in lakes, ponds, streams, reservoirs, and water conveyance systems.

Water quality criteria is established to reduce the effects of salinity and sodicity, minimize deep percolation of contaminated water, and maintain acceptable quality levels in surface and ground water. Criteria for ground water is established to minimize offsite contamination from pesticides, nutrients, salts, organics, metals, and pathogens. Criteria for surface water is established to minimize the contamination by sediment, pesticides, nutrients, salts, organics, metals, pathogens, fecal coliform, other inorganics, and high temperatures.

Water protection criteria is established for water quantity and quality for the protection of endangered or threatened plants or habitat for endangered or threatened animals.

Achieving the criteria for water resources will ensure:

- The proper management and/or disposal of excess water,
- The proper management of water from irrigation or rainfall,
- The proper management for the protection of wetlands
- The protection of endangered and threatened species and their habitat,
- The protection of surface waters from excessive sediment deposits,
- Surface and ground water resources will be free from unacceptable concentrations of substances attributable to man-caused nonpoint source discharges, and
- The protection of endangered or threatened plants and habitat for endangered or threatened animals.