National and State Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**National Quality Criteria**	**Missouri Quality Criteria**	**Measurement Units**	**Assessment Tools for Quality Criteria Evaluation**
SOIL					
Soil Erosion **Sheet and Rill**	Detachment and transport of soil particles caused by rainfall splash and runoff degrade soil quality.	Sheet and rill erosion does not exceed the Soil Loss Tolerance "T".	Same as National	*tons/acre/year* – average annual tons of erosion reduced per acre for the field or planning area/unit	• Visual assessment (pedestals, rills) • Universal Soil Loss Equation • erosion meters • Revised Universal Soil Loss Equations, Version 1and 2
Soil Erosion **Wind**	Detachment and transport of soil particles caused by wind degrade soil quality and/or damage plants.	Wind erosion does not exceed the Soil Loss Tolerance "T" or, for plant damage, does not exceed Crop Damage Tolerances.	Same as National	*tons/acre/year* – average annual tons of erosion reduced per acre for the field or planning area/unit	• Visual assessment (pedestals, blow-out areas) • Wind Erosion Equation (WEQ)
Soil Erosion **Ephemeral Gully**	Small channels caused by surface water runoff degrade soil quality and tend to increase in size. On cropland, they can be obscured by heavy tillage.	Surface water runoff is controlled sufficiently to stabilize the small channels and prevent reoccurrence of new channels.	Same as National	*tons/year* – average annual tons of erosion reduced per acre for the field or planning area/unit	• Visual assessment • Volume calculation • Client records
Soil Erosion **Classic Gully**	Deep, permanent channels caused by the convergence of surface runoff degrade soil quality. They enlarge progressively by headcutting and lateral widening.	Surface water runoff is controlled sufficiently to stop progression of headcutting and widening.	Same as National	*tons/year* – average annual tons of erosion reduced per acre for the field or planning area/unit	• Visual assessment • Volume calculation • Aerial photo trend analysis • Client records

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Soil Erosion **Stream bank**	Accelerated loss of streambank soils restricts land and water use and management.	Accelerated stream bank soil loss does not exceed a level commensurate with upstream land use and normal geomorphological processes on site.	Accelerated stream bank soil loss does not exceed a level commensurate with upstream land use and normal geomorphological processes on site. The stream bank is stabilized between two stable points at the design event.	*tons/year* – average annual tons of erosion reduced per acre for the field or planning area/unit	• Visual assessment, e.g., Stream Visual Assessment Protocol, Proper Functioning Condition (PFC) • Aerial photo trend analysis • Engineering Field Handbook, Chapter 16
Soil Erosion **Shoreline**	Soil is eroded along shorelines by wind and wave action, causing physical damage to vegetation, limiting land use, or creating a safety hazard.	Shoreline erosion is stabilized to a level that does not restrict the use or management of adjacent land, water or structures.	Same as National	*tons/year* – average annual tons of erosion reduced per acre for the field or planning area/unit	• Visual assessment • Aerial photo trend analysis • Volume calculation • Erosion transects
Soil Erosion **Irrigation-induced**	Improper irrigation water application and equipment operation are causing soil erosion that degrades soil quality.	Irrigation-induced erosion does not exceed the Soil Loss Tolerance "T".	Same as National	*tons/acre/year* – average annual tons of erosion reduced per acre for the field or planning area/unit	• SRFR (Surface Irrigation Model) • CPED (Center Pivot Evaluation and Design) • NRCS National and State Irrigation Guides • RUSLE2 • PHARCET
Soil Erosion **Mass Movement**	Soil slippage, landslides, or slope failure, normally on hillsides, result in large volumes of soil movement	Shallow slumps, slides, or slips are prevented or minimized so that the mass movement of soil material does not exceed naturally occurring rates.	Same as National	*tons/year* – average annual tons of erosion reduced per acre for the field or planning area/unit	• Visual assessment • Aerial photo trend analysis • Volume calculation

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Soil Erosion **Road, road sides and Construction Sites**	Soil loss occurs on areas left unprotected during or after road building and/or construction activities.	Sites are adequately protected from soil loss during and after road building and construction activities.	Same as National	*tons/year* – average annual tons of erosion reduced per acre for the field or planning area/unit	• Visual assessment • Volume Calculation • Water and wind erosion prediction tools (RUSLE, RUSLE2 and WEQ)
Soil Condition **Organic Matter Depletion**	Soil organic matter has or will diminish to a level that degrades soil quality.	Soil Conditioning Index is positive.	Same as National	*Soil Conditioning Index (SCI)* – positive improvement in index for the field or planning area/unit	• Soil Conditioning Index • Soil Quality Kit • Soil testing and analysis
Soil Condition **Compaction**	Compressed soil particles and aggregates caused by mechanical compaction adversely affect plant-soil-moisture relationships.	Mechanically compacted soils are renovated sufficiently to restore plant root growth and/or water movement.	Same as National	Non Measurable	• Assessment of plant root systems • Bulk density test-Soil Quality Kit • Dial penetrometer
Soil Condition **Subsidence**	Loss of volume and depth of organic soils due to oxidation caused by above normal microbial activity resulting from excessive drainage or extended drought.	The timing and regime of soil moisture is managed to attain acceptable subsidence rates.	N/A. Not a resource concern in Missouri.	*inches/acre/year* – average annual inches of subsidence reduced per acre for the field or planning area/unit	• Visual assessment • Inventory of volume and depth • Soil probes and witness poles
Soil Condition **Contaminants - Salts and Other Chemicals**	Inorganic chemical elements and compounds such as salts, selenium, boron, and heavy metals restrict the desired use of the soil or exceed the soil buffering capacity	Salinity levels cause less than a 10% decrease in plant yield. Other contaminants do not exceed plant tolerances or are below toxic levels for plants or animals.	Same as National	*Electroconductivity (EC)* – average reduction in EC for the field or planning area/unit	• Soil test • Soil Quality Kit- EC meter • Farm*A*Syst assessment

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Soil Condition **Contaminants - Animal Waste and Other Organics - N**	Nitrogen nutrient levels from applied animal waste and other organics restrict desired use of the land.	Nitrogen nutrient application levels do not exceed soil storage/plant uptake capacities based on soil test recommendations and risk analysis results.	Same as National	*pounds/acre/year* – average annual pounds of nitrogen (N) reduced per acre for the field or planning area/unit	• Soil test • Leaching Index • Plant tissue test • Client application records/history • UMC fertilizer recommendation tool (www.soiltest.psu.missouri.edu/)
Soil Condition **Contaminants - Animal Waste and Other Organics - P**	Phosphorus nutrient levels from applied animal waste and other organics restrict desired use of the land.	Phosphorus nutrient application levels do not exceed soil storage/plant uptake capacities based on soil test recommendations and risk analysis results.	Same as National	*pounds/acre/year* – average annual pounds of nitrogen (P) reduced per acre for the field or planning area/unit	• Soil test • Phosphorus Index • Client application records/history • UMC fertilizer recommendation tool (www.soiltest.psu.missouri.edu/)
Soil Condition **Contaminants - Animal Waste and Other Organics - K**	Potassium nutrient levels from applied animal waste and other organics restrict desired use of the land.	Potassium nutrient application levels do not exceed soil storage/plant uptake capacities based on soil test recommendations and risk analysis results.	Same as National	*pounds/acre/year* – average annual pounds of nitrogen (K) reduced per acre for the field or planning area/unit	• Soil test • Client application records/history • UMC fertilizer recommendation tool (www.soiltest.psu.missouri.edu/)

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SOIL					
Soil Condition **Contaminants - Commercial Fertilizer - N**	Over-application of nitrogen degrades plant health and vigor, or exceeds the soil capacity to retain nutrients.	Soil nutrient levels of nitrogen do not exceed crop needs based on realistic yield goals and appropriate pH levels are maintained.	Soil nutrient levels of nitrogen do not exceed crop needs based on realistic yield goals and risk analysis results. Appropriate pH levels are maintained.	*pounds/acre/year* – average annual pounds of nitrogen (N) reduced per acre for the field or planning area/unit	• Soil Test • Leaching Index • Plant tissue test • Client application records/history • UMC fertilizer recommendation tool (www.soiltest.psu.missouri.edu/)
Soil Condition **Contaminants - Commercial Fertilizer - P**	Over-application of phosphorus degrades plant health and vigor, or exceeds the soil capacity to retain nutrients.	Soil nutrient levels of phosphorus do not exceed crop needs based on realistic yield goals and appropriate pH levels are maintained.	Soil nutrient levels of phosphorus do not exceed crop needs based on realistic yield goals and risk analysis results. Appropriate pH levels are maintained.	*pounds/acre/year* – average annual pounds of nitrogen (P) reduced per acre for the field or planning area/unit	• Soil Test • Phosphorus Index • Client application records/history • UMC fertilizer recommendation tool (www.soiltest.psu.missouri.edu/)
Soil Condition **Contaminants - Commercial Fertilizer - K**	Over-application of potassium degrades plant health and vigor, or exceeds the soil capacity to retain nutrients.	Soil nutrient levels of potassium do not exceed crop needs based on realistic yield goals and appropriate pH levels are maintained.	Soil nutrient levels of potassium do not exceed crop needs based on realistic yield goals and risk analysis results. Appropriate pH levels are maintained.	*pounds/acre/year* – average annual pounds of nitrogen (K) reduced per acre for the field or planning area/unit	• Soil Test • Client application records/history • UMC fertilizer recommendation tool (www.soiltest.psu.missouri.edu/)

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SOIL					
Soil Condition **Contaminants - Residual Pesticides**	Residual pesticides in the soil have an adverse effect on non-target plants and animals.	Pesticides are applied, stored, handled, and disposed of so that residues in the soil do not adversely affect non-target plants and animals.	Storage, handling and application of pesticides and cleanup of equipment are according to label instructions, state cooperative extension recommendations, and pesticide leaching assessments, which consider the leaching potential of the pesticide for soil and site conditions, application methods and climate. Pesticide residues in the soil do not adversely affect non-target plants and animals.	Non Measurable	• Visual assessment • WIN-PST (Windows Pesticide Screening Tool-NRCS) • Soil test • Plant and animal tissue test • Farm*A*Syst
Soil Condition **Damage from Soil Deposition**	Sediment deposition damages or restricts land use/management or adversely affects ecological processes.	Sediment deposition is sufficiently reduced to maintain desired land use/management and ecological processes.	Same as National	*acres/year* – average annual acres of sediment deposition reduced for the field or planning area/unit	• Visual assessment • Volume calculation • Current water and wind erosion prediction tools (RUSLE2 and WEQ) coupled with sediment delivery ratios • Plant and animal community assessment