

National and State Resource Concerns and Quality Criteria					
Natural Resource Concern	Description of Concern	National Quality Criteria	Oklahoma Quality Criteria	Measurable Units	Assessment Tools for Quality Criteria Evaluation
WATER					
<i>Water Quantity</i> Rangeland Hydrologic Cycle	The capacity to capture, store, and safely release water from rainfall, run-on, and snowmelt (where relevant).	Indicators of Rangeland Health Attribute rating for Hydrologic Cycle is Slight to Moderate or less departure from Ecological Reference Sheet (ESD).	Same as National	Departure from Ecological Reference Sheet (ESD) categories – amount of departure, by numeric value, from Ecological Reference Sheet for the field or planning area/unit. 1=None to Slight, 2=Slight to Moderate, 3=Moderate, 4=Moderate to Extreme, or 5=Extreme.	<ul style="list-style-type: none"> Ecological Site Descriptions
<i>Water Quantity</i> Excessive Seepage	Subsurface water oozing to the surface restricts land use and management.	Subsurface water is managed to limit periods of saturation that are unfavorable to the present or intended land use. Management complies with wetland policies.	Same as National	Acres/Year – average annual acres of seep reduced for the field or planning area/unit	<ul style="list-style-type: none"> Visual Assessment (physical presence of water, prevalence of hydrophytic vegetation, etc.) Client interview Area measurements
<i>Water Quantity</i> Excessive Runoff, Flooding, or Ponding	The land becomes inundated, restricting land use and management.	Excess water amounts and/or rates of flow are controlled consistent with desired present or intended land use goals and wetland policies.	Same as National	Non Measurable	<ul style="list-style-type: none"> Visual assessment Client interview Stream Visual Assessment Protocol National Engineering Handbook (EFH – chapter 2 and 3) Hydrologic models, e.g. HECRAS, TR-20, TR-55

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<i>Water Quantity</i> Excessive Subsurface Water	Water saturates upper soil layers restricting land use and management.	Subsurface water is managed to limit periods of saturation compatible with the present or intended land use and wetland policies.	Same as National	Non Measurable	<ul style="list-style-type: none"> • Visual assessment of soil cores and coring holes • Plant quality and quantity measurements • National Engineering Handbook, Part 650 (EFH-Chapter 14)
<i>Water Quantity</i> Drifted Snow	Wind-blown snow deposits and accumulates around and over surface structures restricting ingress, egress and conveyance of humans and animals.	Snowdrifts are reduced or prevented to allow ingress, egress, and conveyance of humans and animals.	Same as National	Non Measurable	<ul style="list-style-type: none"> • Visual assessment • Client interview • Depth and area measurements
<i>Water Quantity</i> Inadequate Outlets	Natural or constructed outlets too small to remove excess water in a timely manner.	Outlets are designed, installed, upgraded or maintained to adequately convey water for present or intended uses.	Same as National	Non Measurable	<ul style="list-style-type: none"> • Visual assessment • Client interview • National Engineering Handbook, part 650 (EFH – Chapters 2,3,7) • Hydrologic models, e.g. HECRAS, TR-20, TR-55
<i>Water Quantity</i> Inefficient Water Use on Irrigated Land	Limited water supplies are not optimally utilized.	Land and water management is planned and coordinated to provide optimal use of natural and applied moisture.	Same as National	Acre-Inches/Acre/Year-average annual acre-inches of water per acre used more beneficially for the field or planning area/unit	<ul style="list-style-type: none"> • Visual assessment • National Engineering Handbook, Part 653, Irrigation Guide • Oklahoma Irrigation Guide – Crop Water Usage Reports • Crop quality and quantity measurements

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<i>Water Quantity</i> Inefficient Water Use on Non-irrigated Land	Natural moisture is not optimally utilized.	Management provides optimum use of natural moisture for the present or intended land use.	Same as National	Acre-Inches/Acre/Year-average annual acre-inches of water per acre used more beneficially for the field or planning area/unit	<ul style="list-style-type: none"> • Visual assessment • Plant or animal quality and quantity measurements
<i>Water Quantity</i> Reduced Capacity of Conveyances by Sediment Deposition	Sediment deposits in ditches, canals, culverts, and other water conveyances reduce the desired flow capacity.	Conveyance structures are upgraded or maintained to adequately convey water for present or intended uses.	Same as National	Cubic yards – volume of sediment in cubic yards removed to maintain water conveyances for the field or planning area/unit	<ul style="list-style-type: none"> • Visual assessment • Client interview • National Engineering Handbook, Part 650 (EFH–Chapters 2,3,7,11) • Hydrologic models, e.g., HECRAS, TR-20, TR-55
<i>Water Quantity</i> Reduced Storage of Water Bodies by Sediment Accumulation	Sediment deposits in water bodies reduce the desired volume capacity.	Water bodies and contributing source areas are treated to allow sufficient water storage for present and intended uses.	Same as National	Acre-Inches/Year – average annual reduction in acre-inches in sediment deposition within water bodies for the field or planning area/unit	<ul style="list-style-type: none"> • Visual assessment • Depth and area measurements • National Engineering Handbook, Part 650 (EFH – Chapters 2,3,7,11)
<i>Water Quantity</i> Aquifer Overdraft	Water withdrawals exceed the safe yield for the aquifer.	Land and water management are coordinated to balance aquifer recharge and withdrawals to maintain the safe yield for the aquifer.	Same as National	Acre-Inches/Year – average annual reduction in acre-inches of groundwater overdraft for the field or planning area/unit	<ul style="list-style-type: none"> • Water level measurements

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<i>Water Quantity</i> Insufficient Flows in Water Courses	Water flows are not consistently available in sufficient quantities to support ecological processes and land use and management.	Authorized uses and management of water are coordinated to minimize the impacts on water course flows.	Same as National	Non Measurable	<ul style="list-style-type: none"> • Visual assessment • Water flow records • Gauge Station data • Consumptive use/allocation water rights • National Biology Handbook
<i>Water Quality</i> Harmful Levels of Pesticides in Groundwater	Residues resulting from the use of pest control chemicals degrade groundwater quality.	Pesticides are applied, stored, handled, disposed of, and managed so that groundwater uses are not adversely affected.	Same as National	Non Measurable	<ul style="list-style-type: none"> • WIN-PST (Windows Pesticide Screening Tool) • NAPRA (National Agricultural Pesticide Risk Analysis) • Vadose zone and groundwater chemical sampling and assay
<i>Water Quality</i> Excessive Nutrients and Organics in Groundwater	Pollution from natural or human induced nutrients such as N, P, S (including animal and other wastes) degrades groundwater quality.	Nutrients and organics are stored, handled, disposed of, and applied such that groundwater uses are not adversely affected.	Same as National	Non Measurable	<ul style="list-style-type: none"> • National Engineering Handbook, Part 651, Ag. Waste Mgt. Field Handbook • Nitrate Leaching Index • Oklahoma Phosphorus Assessment Worksheet • Farm*A*Syst • Vadose zone and groundwater chemical/particle sampling and assay

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<i>Water Quality</i> Excessive Salinity in Groundwater	Pollution from salts such as Ca, Mg, Na, K, HCO ₃ , CO ₃ , Cl, and SO ₄ degrades groundwater quality.	Salts are stored, handled, disposed of, applied, and managed such that groundwater uses are not adversely affected.	Same as National	Electroconductivity (EC) – average reduction in EC for the field or planning area/unit	<ul style="list-style-type: none"> Vadose zone and groundwater salinity sampling (total dissolved solids [TDS] or electrical conductivity) and assay Oklahoma Irrigation Guide Soil salinity sampling and assay
<i>Water Quality</i> Harmful Levels of Heavy Metals in Groundwater	Natural or human-induced metal pollutants present in toxic amounts degrade groundwater quality.	Materials containing heavy metals are stored, handled, disposed of, applied, and managed such that groundwater uses are not adversely affected.	Same as National	Non Measurable	<ul style="list-style-type: none"> Vadose zone and groundwater chemical sampling and assay
<i>Water Quality</i> Harmful Levels of Pathogens in Groundwater	Kinds and numbers of viruses, protozoa, and bacteria are present at a level that degrades groundwater quality.	Materials that harbor pathogens are stored, handled, disposed of, applied, and managed such that groundwater uses are not adversely affected.	Same as National	Non Measurable	<ul style="list-style-type: none"> Vadose zone and groundwater chemical sampling and assay
<i>Water Quality</i> Harmful Levels of Petroleum in Groundwater	Fuel, oil, gasoline and other hydrocarbons present in toxic amounts degrade groundwater quality.	Petroleum products are used, stored, handled, disposed of, and managed such that groundwater uses are not adversely affected.	Same as National	Non Measurable	<ul style="list-style-type: none"> Vadose zone and groundwater chemical sampling and assay
<i>Water Quality</i> Harmful Levels of Pesticides in Surface Water	Pest control chemicals present in toxic amounts degrade surface water quality.	Pesticides are applied, stored, handled, disposed of, and managed such that surface water uses are not adversely affected.	Same as National	Non Measurable	<ul style="list-style-type: none"> WIN-PST (Windows Pesticide Screening Tool) NAPRA (National Agricultural Pesticide Risk Analysis) Surface water chemical sampling assay

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<i>Water Quality</i> Excessive Suspended Sediment and Turbidity in Surface Water	Excessive concentrations of mineral or organic particles, algae, or organic stains degrade surface water quality.	Delivery or suspension of mineral and organic particles, and excessive algae growth or organic stains, is managed such that surface water uses are not adversely affected.	Same as National	Non Measurable	<ul style="list-style-type: none"> • Visual assessment • Client interview • SVAP (Stream Visual Assessment Protocol – USDA/NRCS) • Water Quality Indicators Guide – Surface Waters, Field Sheets IA and 1B (Terrene Institute ©1996) • Surface water chemical/particle sampling and assay
<i>Water Quality</i> Excessive Salinity in Surface Water	Pollution from salts such as Ca, Mg, Na, K, HCO ₃ , CO ₃ , Cl, and SO ₄ degrades surface water quality.	Salts are stored, handled, disposed of, applied, and managed such that surface water uses are not adversely affected.	Same as National	Electroconductivity (EC) – average reduction in EC for the field or planning area/unit	<ul style="list-style-type: none"> • SVAP (Stream Visual Assessment Protocol – USDA/NRCS) – Salinity • Surface water salinity sampling and assay

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<i>Water Quality</i> Harmful Levels of Heavy Metals in Surface Water	Natural or human-induced metal pollutants are present in toxic amounts that degrade surface water quality.	Materials containing heavy metals are stored, handled, disposed of, applied, and managed such that surface water uses are not adversely affected.	Same as National	Non Measurable	<ul style="list-style-type: none"> • Surface water chemical sampling and assay
<i>Water Quality</i> Harmful Temperatures of Surface Water	Undesired thermal conditions degrade surface water quality.	Use and management of land and water are coordinated to minimize impacts on surface water temperatures.	Same as National	Non Measurable	<ul style="list-style-type: none"> • SVAP (Stream Visual Assessment Protocol – USDA/NRCS) – canopy cover • HSI model for target species (Habitat Suitability Index – USF&WS) • Surface water temperature sampling and assay
<i>Water Quality</i> Harmful Levels of Pathogens in Surface Water	Kinds and numbers of viruses, protozoa, and bacteria are present at a level that degrades surface water quality.	Materials that harbor pathogens are stored, handled, disposed of, applied, and managed such that surface water uses are not adversely affected.	Same as National	Non Measurable	<ul style="list-style-type: none"> • Surface water pathogen sampling and assay
<i>Water Quality</i> Harmful Levels of Petroleum in Surface Water	Fuel, oil, gasoline and other hydrocarbons present in toxic amounts degrade surface water quality.	Petroleum products are used, stored, handled, and disposed of such that surface water uses are not adversely affected.	Same as National	Non Measurable	<ul style="list-style-type: none"> • Surface water chemical sampling and assay