

# Verdigris River Basin Management Categories

January 2009

## WATER MANAGEMENT CATEGORIES

The following categories include issues identified in the [Verdigris basin](#) plan as items that require attention in addition to the basin priority issues. These issues are addressed within the following management categories:

- Water Management
- Water Conservation
- Public Water Supply
- Water Quality
- Wetland and Riparian Management
- Flood Management
- Water-Based Recreation

These categories also correspond to the statewide management categories and policies of the *Kansas Water Plan* found in [Volume II](#). These documents contain new policy issues and the existing policy and statutory framework that relate to the management categories.

### ISSUE: WATER MANAGEMENT

See [Protecting and Enhancing Instream Flow Basin Priority Issue](#)

### Applicable Kansas Water Plan Objectives

- Achieve sustainable yield management of Kansas surface and ground water sources outside of the Ogallala-High Plains aquifer and areas specifically exempt by regulation. Sustainable yield management would be a goal that sets water management criteria to ensure long term trends in water use will move as close as possible to stable ground water levels and maintenance of sufficient streamflows.
- Meet minimum desirable streamflow at a frequency no less than the historical achievement for the individual sites at time of enactment.

### Applicable Programs

The following programs help to meet the objectives in the Water Management (quantity) category. For more information on the programs and associated policies, see the [Programs Manual](#).

- Kansas Department of Agriculture-Division of Water Resources: Water Appropriation Program
- Kansas Geological Survey and Kansas Department of Agriculture-Division of Water Resources: Water Well Measurement
- USDA-Natural Resources Conservation Service: En-

vironmental Quality Incentive Program

### ISSUE: WATER CONSERVATION

Water conservation is essential for the effective management of water resources in the basin to assure that a sufficient, long-term, supply of water is available for the beneficial uses of the people of the state. Conservation is defined as a careful preservation and protection of something, especially the planned management of a natural resource to prevent exploitation or destruction. Water conservation is a part of maintaining a long-term water supply for Kansas.

Unaccounted for water includes any unmetered uses such as water used for fire fighting and watering of public areas, plus water loss in the distribution system. Technical assistance is available through the Kansas Water Office (KWO) for systems with more than 30% unaccounted for water. High amounts of unaccounted for water may result from water line breaks, under registering customers, unmetered uses, faulty metering or inaccurate accounting. The statewide average percentage of unaccounted for water use in 2006 was 14% statewide. Management of unaccounted for water is a fundamental tool in providing adequate water supply. Some unaccounted for water represents water that has been treated and then has been wasted and lost the potential to be put to beneficial uses.

Of the 66 [public water suppliers](#) in the Verdigris basin, 42 have an approved municipal conservation plan. Of those suppliers with approved plans, only two have submitted updated plans under the 2007 KWO Municipal Conservation Plan Guidelines. All other plans were developed based on guidelines from 1990 and should be updated to incorporate the 2007 changes.

### 2007 Kansas Municipal Water Conservation



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Most water utilities consider water as a commodity and encourage the use of water by their customers by striving to keep rates low. The availability of plentiful inexpensive water is promoted by communities in attracting new growth. More recently, communities are adopting rate structures that result in increased cost with increased use. This is one form of demand management.

The four basic types of water rate structures used by public water suppliers in Kansas are described as flat rate, decreasing block rate, uniform block rate, and increasing block rate. Utilities with a flat rate charge each customer a fixed amount per month regardless of the amount of water used. With a decreasing block rate, the unit cost of water decreases as usage increases. The unit cost of water is the same for all levels of usage with a uniform block rate. With an increasing block rate, the unit cost of water rises as usage increases.

The type of rate structure can affect gallons per capita per day (gpcd) usage. Systems with flat rates tend to use considerably more water per capita than systems that meter customer use. The other three types of rate structures, in which cost depends on amount of water used, have a less dramatic effect on gpcd. Decreasing block rates are assumed to discourage conservation because customers are charged lower rates for high-volume usage. Increasing block rates are considered an effective way to promote conservation among high-volume users while keeping the cost of moderate use affordable. However, the use of these types of rate structures does not appear to influence usage by individual customers as much as does the total monthly water cost and the geographic area in which they live.

Drought Stage Triggers (Table 1) are the signals that water shortage or other conditions indicative of drought have reached certain stages or levels. They act as the signal to begin implementation of the appropriate stage. Triggers may be related to supply conditions or demand levels. A given stage should have more than one trigger to confirm that conditions are worsening. A water utility or other municipal water entity should enact the appropriate stage whenever the agreed upon set of triggers is reached. Delay in action may lead to a major disruption of the water supply system at a later time.

Every public water supply drought response plan should be set up in stages, each one more stringent than the one before it. Triggering mechanisms should be identified to signal the start of a given stage and specific goals should be identified as the desired outcome for each stage. Finally, appropriate conservation practices in the

areas of education, management and regulation should be listed under each stage. Stages are appropriate to implement drought response practices or actions because the impact of conservation practices of a moderate stage may preclude the need for the municipal water entity to enact more severe conservation practices at a subsequent stage.

**Table 1.**  
**Drought Stage Triggers used by public water suppliers with surface water sources:**

1. Lake level in terms of elevation or capacity.
2. Stream level in terms of flow or stage.
3. Water level in relation to the dam.
4. Peak daily demand levels.
5. Percent capacity of treatment plant operations over a number of days.
6. Capacity of water system storage and ability to recover.
7. The provider for purchased water has issued a drought stage.
8. Emergency conditions related to repairs or water quality.
9. The KWO has issued a drought stage based on the remaining water marketing storage in a basin reservoir.

Drought vulnerable public water supplies are those suppliers most likely to be first impacted by drought due to basic source, distribution system or treatment capacity limitations; or that rely on a single well as a water supply source. Drought vulnerable water supplies were surveyed in 2003 and 2006. The number of public water supplies considered drought vulnerable decreased from 21 to 10 between the two surveys (Table 2). Delivery of the Kansas Department of Health and Environment (KDHE) Capacity Development Program has been beneficial in reducing drought vulnerability throughout the state as communities assess their systems and identify areas in need of improvement.

Supplier Name	New to List	Limitation
Cedar Vale	No	Basic Source
Grenola	No	Basic Source
Hamilton	Yes	Unknown
Longton	No	Basic Source
Madison	Yes	Basic Source
Neodesha	Yes	Unknown
Wilson RWD 01	No	Contractual
Wilson RWD 02	No	Contractual
Wilson RWD 05	No	Contractual
Wilson RWD 07	No	Contractual

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## Applicable Kansas Water Plan Objectives

- Reduce the number of public water suppliers with excessive “unaccounted for” water by first targeting those with 30% or more “unaccounted for” water.
- All non-domestic points of diversion meeting predetermined criteria will be metered, gaged or otherwise measured.
- Conservation plans will be required for water rights meeting priority criteria under K.S.A. 82a-733 if it is determined that such a plan would result in significant water management improvement.

## Applicable Programs

The following programs help to meet the objectives in the Water Conservation category. For more information on the programs and associated policies, see the [Programs Manual](#).

- Kansas Department of Agriculture-Division of Water Resources: Water Appropriation Program
- Kansas Water Office: Water Conservation Program
- Kansas Department of Health and Environment: Kansas Public Water Supply Loan Fund
- USDA-Farm Service Agency: Conservation Reserve Program

## ISSUE: PUBLIC WATER SUPPLY

Also see [Surface Water Management and Conservation Basin Issue Paper](#).

The primary approach to addressing public water supply issues in the basin focuses on ensuring that there are adequate supplies of [surface](#) and ground water within the basin to meet future water demands, reducing the number of public water supply systems that are vulnerable to drought, and ensuring that systems have the technical, financial and managerial capacity to meet future needs for water quality and quantity.

There are 66 [public water suppliers](#) in the basin, including 36 rural water districts. There are currently four public wholesale water supply districts (PWWSD) in the basin. Surface water is the primary source for most public water supplies, accounting for over 99% of the total supply. Streamflows in the basin are highly variable within the year, and from one year to another. [Fall River](#), [Toronto](#), [Elk City](#) and [Big Hill](#) reservoirs are operated through a memorandum of agreement to maximize use of the stored water.

A Regional Public Water Supply Planning Grant to PWWSD #24 (Elk City, Howard, Longton, Severy and Moline) was completed in 2007. The district is pursuing consolidation with PWWSD #20 as the best solution to water supply vulnerability concerns. Construction of the project will decommission five small surface water treatment plants that are currently out of compliance with Safe Drinking Water Act requirements. The other PWWSDs are #4, which utilizes Big Hill Reservoir as a water source for 16 cities and rural water districts, and #23, that is under development and plans to upgrade and utilize the Fredonia treatment plant and distribution system.



Water Tower South of Cherryvale.  
Photo courtesy KGS.

Water usage in gpcd is calculated for each water system in the state from reported data on water use and population served. Average gpcd figures for large, medium and small water suppliers are calculated in eight regions of the state based on similar geographic areas. The Verdigris basin is located in region 7. Average gpcd for large, medium and small suppliers in region 7 are, 148, 107 and 96 respectively. This serves as a reference to indicate if individual suppliers are above or below average usage for the region. The average gpcd water consumption is 105 in the Verdigris basin.

## Applicable Kansas Water Plan Objectives

- Ensure that sufficient surface water storage is available to meet projected year 2040 public water supply needs for areas of Kansas with current or potential access to surface water storage.
- Less than five percent of public water suppliers will be drought vulnerable.
- Ensure that all public water suppliers have the technical, financial and managerial capability to meet their needs and to meet Safe Drinking Water Act requirements.

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## Applicable Programs

The following programs help to meet the objectives in the Public Water Supply category. For more information on the programs and associated policies, see the [Programs Manual](#).

- Kansas Department of Agriculture-Division of Water Resources: Water Appropriation Program
- Kansas Department of Health and Environment: Public Water Supply Program
- Kansas Water Office: State Water Planning Program
- Kansas Water Office: Water Conservation Program

## ISSUE: WATER QUALITY

See [Watershed Restoration and Protection Basin Priority Issue](#).

Water quality and related water resource issues are addressed through a combination of watershed restoration and protection efforts utilizing voluntary, incentive based approaches, as well as regulatory programs

## Applicable Kansas Water Plan Objectives

- Reduce the average concentration of bacteria, biochemical oxygen demand, solids, metals, nutrients, pesticides and sediment that adversely affect the water quality of Kansas lakes and streams.
- Ensure that water quality conditions are maintained at a level equal to or better than year 2000 conditions.
- Reduce the average concentration of dissolved solids, metals, nitrates, pesticides and volatile organic chemicals that adversely affect the water quality of Kansas ground water.
- Maintain, enhance, or restore priority wetlands and riparian areas.
- Nutrient reduction goals will be included in all Watershed Restoration and Protection Strategy (WRAPS) projects within the basin.
- All public water suppliers will complete and implement a source water protection plan.

## Applicable Programs

The following programs help to meet the objectives in the Water Quality category. For more information on the programs and associated policies, see the [Programs Manual](#).

- Kansas Department of Health and Environment:

State Water Plan Program (Contamination Remediation)

- Kansas Corporation Commission: Conservation Division Programs
- Kansas Department of Health and Environment: Local Environmental Protection Program
- Kansas Department of Health and Environment: Watershed Management Program
- State Conservation Commission: Nonpoint Source Pollution Control Program
- State Conservation Commission: Water Resources Cost-Share Program



Verdigris River near Coffeyville. Photo courtesy KGS.

## ISSUE: WETLAND AND RIPARIAN MANAGEMENT

See the [Watershed Restoration and Protection Basin Priority Issue](#) for a discussion of current activities concerning wetland and riparian area protection.

The primary approach to wetland and riparian management in the basin focuses on providing technical and financial assistance to landowners to protect and restore these resources in priority watersheds through the implementation of best management practices.

## Applicable Kansas Water Plan Objectives

- Maintain, enhance or restore priority wetlands and riparian areas.

## Applicable Programs

The following programs help to meet the objectives in the Wetland and Riparian Management category. For more information on the programs and associated policies, see the [Programs Manual](#).

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- Kansas Forest Service: Forest Stewardship Program and Conservation Tree Planting Program
- State Conservation Commission: Riparian and Wetland Protection Program
- Kansas Water Office: State Water Planning Program
- Kansas Department of Wildlife and Parks: State Parks and Wildlife Areas Planning and Development
- Kansas Department of Wildlife and Parks: Wildlife Habitat Improvement Program
- Kansas Department of Wildlife and Parks: Conservation Easement Program

## ISSUE: FLOOD MANAGEMENT

See [Comprehensive Flood Assessment Basin Priority Issue](#).

The primary approach to flood management in the basin focuses on floodplain management through community participation in the National Flood Insurance Program and reduction of rural flood damages through construction of watershed dams in organized watershed districts.

### Applicable *Kansas Water Plan* Objectives

- Reduce the vulnerability to damage from floods within identified priority communities or areas.

### Applicable Programs

The following programs help to meet the objectives in the Flood Management category. For more information on the programs and associated policies, see the [Programs Manual](#).

- Kansas Department of Agriculture-Division of Water Resources: Water Structures Program/Floodplain Management
- State Conservation Commission: Watershed Dam Construction Program
- State Conservation Commission: Watershed Planning Assistance Program
- Kansas Division of Emergency Management: Hazard Mitigation Grants Program
- FEMA: National Flood Insurance Program

## ISSUE: WATER-BASED RECREATION

The state's rivers, streams and lakes represent a valuable recreational resource. Consideration of water basin recreation issues, problems and concerns are addressed in the [Water Based Recreation Policy Section](#). Even though the Verdigris basin has four large federal lakes

that have recreation components, there is still a demand for more water based recreation facilities, particularly for fishing, hiking, motor boating and water skiing. The Verdigris River and its tributaries are not among the three rivers in the state considered open for public access.

### Applicable *Kansas Water Plan* Objectives

- Increase public recreational opportunities at Kansas lakes and streams.

### Applicable Programs

The following programs help to meet the objectives in the Water-Based Recreation category. For more information on the programs and associated policies, see the [Programs Manual](#).

- Kansas Department of Wildlife and Parks: Rivers and Stream Access
- Kansas Water Office: State Water Planning Program
- Kansas Department of Wildlife and Parks: Fishing Impoundments and Stream Habitats (F.I.S.H.) Program/Walk-in Fishing
- Kansas Department of Wildlife and Parks: Walk-in Hunting Access Program
- Kansas Department of Wildlife and Parks: Community Fisheries Assistance Program

## ISSUES FOR FUTURE ACTION

- Recreational use of the Verdigris River.