

DRAFT FY 2006 WATER ISSUE STRATEGIC PLAN

March 9, 2004

Upper Arkansas Basin

Agencies: KDHE, KDA-DWR, KWO, KGS, KBS, KSU

ISSUE: Long Term Restoration of Water Quality Along the Upper Arkansas River. The Arkansas River entering Kansas from Colorado has among the highest total dissolved solid (TDS) content of any stream in the nation. While the primary source of this salinity is underlying soils and bedrock within the drainage of Eastern Colorado, the in-stream concentrations are elevated by historic and current irrigation practices through consumption of water along the arid plains and leaching of residual salts through the soil profiles by subsequent application of flood irrigation. The long-term elevation of salts within the river now has migrated into the underlying ground water supplies primarily of Hamilton, Kearny and Finney counties, impacting regional water use principally irrigation, stock water and municipal uses. Furthermore, the increased salinity is co-mingled with rises of selenium, a bio-accumulated toxin to fish, wildlife and waterfowl in and around the river. Reversal of this mass transfer of salt must begin to protect the integrity of the surface and groundwater supplies of the Upper Arkansas River Corridor.

GOAL: Reduce the impacts of high salinity on agricultural, municipal and ecological uses along the Arkansas River from the Colorado-Kansas Stateline to the Finney-Gray County Line.

STATE WATER PLAN OBJECTIVES:

■By 2010, reduce the average concentration of bacteria, biochemical oxygen demand, dissolved solids, metals, nutrients, pesticides and sediment that adversely affect the water quality of Kansas lakes and streams.

■By 2010, reduce the average concentration of dissolved solids, metals, nitrates, pesticides and volatile organic chemicals that adversely affect the water quality of Kansas ground water.

■By 2010, ensure that water quality conditions are maintained at a level equal to or better than year 2000 conditions.

ISSUE OBJECTIVES:

1. Reduce the average concentration of total dissolved solids (TDS) in the Arkansas River entering Kansas.
2. Establish background concentration goals of sulfate, boron and selenium for the Arkansas River.
3. Incorporate water quality considerations into river operations under the Arkansas River Compact (Compact).
4. Reduce long-term consumptive use along Arkansas River corridor to improve water quality.
5. Provide long-term source water protection for Kansas communities along the Arkansas River.

STRATEGIES:

1. Incorporate bi-state collaboration between Colorado and Kansas in addressing this issue as part of the administrative agenda for the Governors of both States.
2. Initiate studies in irrigation management, stream channel rehabilitation and ground water management on reducing the salinity and consumptive use of water in the Arkansas River, improving water quality conditions to the regional ground water systems and improving biological integrity of the flora and fauna of the Upper Arkansas River.
3. Implement protection and restoration plans for water resources along the Arkansas River through source water protection plans and total maximum daily loads (TMDLs) in Kansas.
4. Integrate the goal of water quality improvement into Compact administration and water right management decisions in Colorado and Kansas.

ACTIVITIES:

Bi-State Collaboration

1a. The Kansas Governor invites the Colorado Governor to collaborate on water quality improvement on the Arkansas River in both States.

Agency: Governor's Sub-Cabinet on Natural Resources

Completion Timeline: April 2004

1b. Draft and sign a Joint Memorandum of Agreement between the two States to conduct appropriate studies on irrigation management for salinity reduction.

Agency: Kansas Department of Health and Environment & Kansas Department of Agriculture (KDA)-Division of Water Resources

Completion Timeline: July 2004

1c. Develop a joint strategy with Colorado for obtaining funding for studies from the Federal Government and delegate study tasks to the respective institutions in both States to conduct the research and any applied pilot studies.

Agency: Kansas Department of Health and Environment

Completion Timeline: July 2004

Studies

2a. Initiate studies by Colorado State University, Kansas State University and Kansas Geological Survey to examine the impact of current irrigation practices on salt loading to the Arkansas River and determine changes in salt loading, river concentrations, crop yields and consumptive use produced by alternative practices.

Agency: Kansas Department of Health and Environment, Kansas Water Office & KDA- Division of Water Resources & Kansas State University & Kansas Geological Survey (via contracts)

Completion Timeline: September 2007

2b. Evaluate the impacts of ditch company canal operations in Kansas and Colorado on recharge of underlying ground waters and their corresponding water quality.

Agency: Kansas Department of Health and Environment & KDA-Division of Water Resources & Kansas Geological Survey

Completion Timeline: June 2006

2c. The Kansas Geological Survey analyzes changes in water quality of alluvial aquifer and High Plains Aquifer beyond the Arkansas River in response to reduced river salinity over the next 20 years.

Agency: Kansas Department of Health and Environment & Kansas Geological Survey (via contract)

Completion Timeline: June 2006

2d. Initiate a study by Kansas Biological Survey on existing biological characteristics of Arkansas River corridor, likely impacts of current elevated levels of selenium and probable biotic response to reduction in river selenium concentrations.

Agency: Kansas Department of Health and Environment & Kansas Biological Survey (via contract)

Completion Timeline: July 2007

2e. Initiate a technical evaluation of stream rehabilitation on the Arkansas River west of Garden City by the Corps of Engineers or Bureau of Reclamation, including:

- (1) Removal of Salt Cedar and other invasive riparian vegetation
- (2) Reshaping of channel to original morphology for more efficient conveyance of streamflows to Garden City area

Agency: Kansas Water Office & KDA-Division of Water Resources

Completion Timeline: September 2005

2f. Utilize a long-term program for maintaining and upgrading aquifer models so that existing or modified calibrated computer models can be used to answer planning and management questions by state agencies and Southwest Groundwater Management District No. 3.

Agencies: Kansas Geological Survey, KDA-Division of Water Resources -
Division of Water Resources, Kansas Water Office & Kansas Department of
Health and Environment
Initial Timeline: July 2005

Source Water Protection and Restoration

3a. Incorporate source water protection plans into any proposed regionalization of water supplies in Hamilton, Kearny, and Finney Counties.

Agency: Kansas Department of Health and Environment
Completion Timeline: December 2007

3b. Evaluate alternative locations for municipal wells that offer lower salinity content and also reduce the induced infiltration of river water into alluvium near the existing pumping centers.

Agency: Kansas Department of Health and Environment, KDA-Division of Water Resources & Kansas Geological Survey
Completion Timeline: December 2004

3c. Process applications for change of use for existing irrigation ground water rights to be purchased and converted to municipal use by salinity impaired Kansas communities along Arkansas River.

Agency: KDA-Division of Water Resources
Completion Timeline: Ongoing

3d. Revise sulfate and boron TMDLs for Arkansas River at Garden City in 2005 into a Total Dissolved Solids (TDS) TMDL to achieve long-term endpoints of desired sulfate, boron and selenium levels by 2025 based on normal background concentrations in the river.

Agency: Kansas Department of Health and Environment
Completion Timeline: March 2006

3e. Incorporate interim milestones for short-term reductions in average concentrations of salts at monitoring stations from Coolidge to Pierceville in 2010 and 2020 within the Arkansas River Total Dissolved Solids (TDS) TMDL.

Agency: Kansas Department of Health and Environment
Completion Timeline: March 2006

3f. Inventory impacts of elevated TDS levels in the Arkansas River, including yields from lands irrigated by ditch company water, changes in ground water concentrations of dissolved solids, biotic characteristics along the river and movement of salt within the river corridor.

Agency: Kansas Department of Health and Environment, KDA-Division of Water Resources, Kansas Geological Survey, Kansas Biological Survey and Kansas State University.

Completion Timeline: December 2007

3g. Continue to condition existing and new NPDES permitted facilities discharging water into the Arkansas River so as to discharge wastewaters with sulfate and selenium levels below background concentrations.

Agency: Kansas Department of Health and Environment

Initial Timeline: July 2006

Irrigation Water Management

4a. Incorporate water quality considerations into the administration of the Arkansas River Compact and State and Federal law using irrigation best management practices and operational changes.

Agency: KDA-Division of Water Resources

Completion Timeline: December 2008

4b. Develop modified mechanisms for release and delivery of water from JMR that will improve water quality to Kansas.

Agency: KDA-Division of Water Resources - Division of Water Resources

Initial Timeline: January 2007

4c. Actively protect historically available high flows originating in Colorado in the Arkansas River system to flush accumulated salts from the river system.

Agency: KDA-Division of Water Resources

Initial Timeline: January 2004

4d. Target high priority irrigation wells for water use reduction using State or Federal incentive based programs in the Arkansas River corridor from Pueblo Reservoir thru Finney County (especially within the existing Intensive Groundwater Use Control Area (IGUCA)), to address water quality improvements in the river.

Agency: KDA-Division of Water Resources & State Conservation Commission

Initial Timeline: July 2005

4e. Evaluate results of studies conducted in 2a and 2b.

Agency: KDA-Division of Water Resources

Completion Timeline: December 2008

4f. Target SCC Water Resource Cost-Share Program funding toward continued implementation of water conservation practices within the Upper Arkansas River Corridor (especially IGUCA).

Agency: KDA-Division of Water Resources, Southwest Kansas Groundwater Management District No. 3 & State Conservation Commission

Initial Timeline: July 2005

FUNDING NEEDS

Most activities can be accommodated within existing resources for FY 2005 – 2008. The exception would be the studies. Tentative estimates of funding are as follows:

1. Study on alternative irrigation practices and impact on salt loading – 3 years, \$450,000 via EPA grant to Colorado & Kansas
2. Analysis by Kansas Geological Survey on changes in water quality of aquifers in response to decreased river salinity in Arkansas River – 1 year, \$30,000 via State Water Plan Fund
3. Study by Kansas Biological Survey on existing biological characteristics of Arkansas River corridor and impacts of selenium – 2 years, \$50,000 via State Water Plan Fund.
4. Technical evaluation of stream rehabilitation on the Arkansas River, including vegetation removal and channel reshaping slated to be accomplished within one year, utilizing Corps reconnaissance or Bureau State Water Planning funds.
5. Maintenance and upgrades to existing aquifer models applicable to this strategic plan will be incorporated into the emerging program developed by Kansas Geological Survey through the Kansas Water Office.