

# Producers are making a difference in the Cheney Lake Watershed

The United States, Bureau of Reclamation (USBR), in the Department of the Interior, has seven projects in Kansas. One of these projects is the Wichita Project, Cheney Division. The purpose of this project is to provide a supplemental water supply to the city of Wichita, flood control for downstream areas, and fish and wildlife benefits. Cheney Dam and Reservoir are the primary components of the project.

The city of Wichita originally relied on wells in close proximity to the Arkansas River near the Wichita Water Company treatment plant. In the late 1930s, partly because of drought-induced low surface water flows and because of industrial pollution from upstream, the city

was forced to go to the Equus Beds Aquifer to supply usable drinking water. Wichita's post-World War II population growth, coupled with the USBR's desire to add public water supply to their traditional irrigation development mission, brought the city and the USBR together to discuss their mutual goals in

1949. Their conversation led to the construction of a dam, reservoir, pumping plant and pipeline. Water from Cheney Reservoir was delivered to Wichita 16 years later in 1965.

The site of Cheney Dam was chosen primarily because of economics. The valley of the North Fork Ninescah River at the dam's location is so broad that the 126.2

feet high dam has a length of more than 4.5 miles. The water quality of the North Fork Ninescah River was superior to that of the Arkansas River, as there was very little industrial activity, if any, in the watershed. But then, so was every other source that was considered.

There was probably little evaluation of the changes that would occur to the quality of the water stored in a shallow reservoir exposed to sun and wind. Costs and support of the public, state agencies and ultimately the U.S. Congress were of much higher priority. Because the overall

costs of construction and delivery of the water to Wichita from the Cheney site were cheapest of any of the other alternatives, this site won.

Because the North Fork Ninescah River is part of the larger Arkansas River Basin,



*Left: Strong winds from the northwest push large waves onto the face of Cheney Dam.*



*Doug Helmke  
Water Rights,  
Source Water Specialist*



*Because of Cheney Lake's elevated location and flat topography, lake winds are allowed to blow unimpeded across the lake. The ideal wind conditions delight landlocked sailors from Kansas and lure sailors from across the country to the many organized regadas scheduled throughout Cheney Lake's long sailing season.*



*The North Fork Ninnescah River near Castleton, Kansas, a few miles upstream of Cheney Reservoir, is seldom more than a few feet deep at base flow.*

water storage projects like Cheney Dam fall under the Arkansas-White-Red Basins Inter-Agency Committee, which was established in 1955. The Cheney Dam project was subject to scrutiny by the other seven member states and federal agencies. The United States Public Health Service was one of the most critical of the project, and would not give its support if the increase in water use by Wichita would only cause a similar increase in pollution of the Arkansas River. Wichita, working with the Kansas State Board of Health, identified the pollution problems and the abatement programs that would address the problems. The Board of Health recommended to U.S. Public Health that federal aid be conditioned to Wichita's adoption of the abatement programs. This recommendation was accepted. Environmental stewardship has been an important part of this project from the beginning.

In the early years, Cheney Reservoir was helpful in meeting Wichita's peak water demands. Wichita started relying on Cheney water to a much greater extent in the 1980s to meet increasing water demand. In 1990, the first of many incidents occurred in which patrons were able to detect objectionable

taste and odor conditions in their drinking water. The fact that these incidents came and went probably compounded the negative perception. Tap water could be nearly tasteless and odorless for one



month and for the next month be objectionable to consumers.

Wichita needed a plan if they were going to get the public to accept greater quantities of water from Cheney Reservoir (which would allow the city to continue to meet demand). To better understand the cause of the taste and odor

problem, Wichita asked the United States Geological Survey to analyze what constituent or constituents could be the cause or causes and to identify what could be done to abate them. It wasn't long before

algal blooms were identified. Algae are very prolific in the environment created by the reservoir. Sunshine, and for certain species only some sunshine, combined with strong winds to circulate the water, helps warm the entire water

body with efficient mixing. Add some nutrients with some large inflow events, and the recipe is complete.

After identifying the culprit, it was time to take action. Treatment techniques for algal-induced taste and odor are neither easy nor cheap, so the best way to fix the problem is



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through the control of nutrients reaching the lake. After identifying phosphorus as the nutrient most exceeding water quality goals, more research was needed to find its source and transportation mode. Research of the watershed and reservoir determined that land in agricultural production had the capacity to contribute 2.9 times more phosphorus than non-agricultural land, and that agricultural practices accounted for approximately 65% of the phosphorus in the water. However, if the phosphorus in fertilizers and animal waste could be kept from reaching the streams, the natural occurrence of phosphorus in the watershed's soils would still cause the recommended standard of 0.10 milligrams per liter (mg/l) to be exceeded in the river. More "best management practices" need to be implemented to control the sediment to which phosphorus is bonded from reaching the river. Erosion control will also help meet a secondary goal of prolonging the life of the reservoir.

The beginning of Cheney Lake Watershed, Inc. was induced in the early 1990s when the Reno County Conservation District and the Agricultural Stabilization and Conservation Service formed a task force to explore the options available to implement conservation practices that might improve water quality related to Wichita's taste and

odor problem. This task force included many farmers and was chaired by one. It also included state and federal agency representatives and a representative from the city of Wichita. They held listening



meetings in the watershed, reviewed the research that was recently conducted regarding the potential contaminants, developed a plan of action and searched for funding.

The Reno County Conservation District established a subcommittee of local landowners which was called the Citizens Management Committee (CMC) to guide the watershed project. Composed of many of the same farmers on the task force, this committee was composed of landowners within the watershed that wanted to implement farm-and-water-friendly practices. Because the CMC was successful in receiving Environmental Protection Agency Section 319 non-point source pollution control funds through the Kansas Department of Health and Environment and also

funding from the city of Wichita, it was recognized that work could be done throughout the contributing portions of the watershed. Cheney Lake Watershed, Inc. was formed in 1999 as an Internal Revenue Service Section 501c-3 non-profit organization and now works in the entire contributing watershed in Reno, Stafford, Pratt and Kingman counties. Cheney Lake Watershed, Inc. is governed by the CMC, which is now a seven member board, with four persons representing specific areas of the watershed and three persons elected at-large.

The CMC remains active in promoting their purpose, educating their constituents and securing funding for their various projects. They have a Web site that can be accessed at [www.cheneylakewatershed.org](http://www.cheneylakewatershed.org) and has a quarterly newsletter that is mailed to their constituents. Signs have been installed at stream crossings to remind residents and visitors to the area that water quality protection is important. Demonstration projects have been installed such as alternative livestock watering systems, filter strips and rotational grazing practices.

The committee has promoted field days throughout the watershed to highlight how producers have been able to reduce negative impacts to the water quality through cost effective measures. One recent

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tour featured dairy farms. One farm demonstrated its method of allowing cattle to graze on a variety of vegetation, including crabgrass, irrigated by center-pivot irrigation. Another dairy farm featured its



rotational grazing program which included a concrete waterway crossing to minimize damage that cattle would create when the water way was wet. Allowing the dairy cattle to graze reduces the concentration of manure (and nutrients and bacteria) in one location and the potential of these contaminants entering nearby streams.

Another recent project is to provide funding to fence areas that are exiting the Conservation Reserve Program and are not being re-enrolled. Studies indicate that land used as pasture contributes much less phosphorus than cultivated fields, so if a producer can make more profit raising cattle than crops, it's in the producer's and watershed's best interest to go that direction. If the cost of the fence can be reduced or eliminated, it's more likely that this practice will be adopted. The city of Wichita has endorsed this practice and in many cases, has contributed the remaining funding not covered by state or federal agencies, so there is no cost to the producer for fencing.

The city of Wichita has contributed a total of \$830,597 to the Cheney Lake Watershed as cost share to install conservation

practices from March 1995 through December 2007. While this is a large amount of money (an average of \$68,892 per year), Wichita likely collected this amount with an increase of only a few cents per



water bill. Early on, the city recognized that success of the program was largely based on the local landowners being comfortable with the program. Wichita has been very careful to avoid the perception by local producers that they are demanding improvement of the river's and lake's water quality. Cheney Lake Watershed has been instrumental in explaining the benefits of improving the water quality by participating in their programs.

These recent successes have been documented in a Conservation Effects Assessment Project, resulting in the Cheney Lake Watershed being mentioned in a recent public address by the U.S. Secretary of Agriculture. Researchers from coast to coast and policy makers from Washington, D.C. visit their office regularly to learn how the transition was made from problem-recognition to active-management. One researcher invited to assess the streams and stream banks of the watershed was impressed with the cooperation of the landowners and watershed

leaders. This cooperation, much of which was established through small meetings of individuals, was instrumental in making a complete, and more accurate, assessment of the watershed system.

*Far left: The Cheney Dam, Wichita Project sign can be seen along the road below the dam on the south end of the lake.*

*Left: A sunny day on Cheney is the norm for summers at the lake. The wind will most likely be there to cool off a boater or fisherman on the hottest of days.*

Source water protection activities can be employed by all water systems, regardless of their size or location. Because many conservation grants require at least some match by the participant to increase the receiver's share of ownership in the project, water systems should consider if they should apply some funds in projects that will protect the water on which they rely. Wichita provides an excellent example of how a water system can be a nearly silent, yet influential, partner in improving water quality.

Lisa French, Cheney Lake Watershed's Project Coordinator, will be sharing her knowledge and experience of building a successful watershed protection program at the Kansas Rural Water Association's Annual Conference at 10:45 A.M., Thursday, March 27, 2008. Please join her and representatives from the city of Wichita as they provide ideas for successful leadership in this important water partnership.