

Protection Makes \$ense

Protecting a drinking water source from contaminants is less expensive than treating the water and uses less energy. Other benefits include wildlife and fish habitat improvement, increased recreation enjoyment and enhanced aesthetics.

Further decline in Cheney Reservoir water quality is expected unless nutrient and sediment loads to the reservoir are reduced. Declines in water quality would mean increased problems with taste and odor in treated water. The City of Wichita, Water Department has explored treatment process options to control taste and odor. Powered activated carbon fed at the lake water intake appears the most feasible and has an estimated cost of \$1 million per year.

Project implementation is expected to reduce nutrient loads to Cheney Reservoir. This should prevent further decline in lake water quality. Watershed management to protect water quality is the insurance that limits the risk of damage to drinking water and to the aquatic environment.

The expected cost to implement the Cheney Lake Water Quality Project, N.F. Ninnescah River Watershed, from 1995-2001 totals \$3.1 million for cost-share incentives. Administrative cost for the 6 year implementation phase is \$3.75 million including \$250,000 for demonstration projects. The project budget totals \$6.85 million. This is about one third of the \$20 million expected cost to treat water for the next 20 years. Implementing source-water protection represents a wise investment in infrastructure that saves money and protects the environment.

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PROTECT DRINKING WATER

EMPOWERING LOCAL DECISION MAKERS

I N K A N S A S

Watershed Management

**For Cheney Reservoir
to Protect
a Drinking Water Source**



**A TOOL TO HELP
ASSURE QUALITY OF LIFE
IN LOCAL COMMUNITIES**

Watershed management is the best way to protect and enhance surface-water quality. Water quality can be protected by assessing pollution sources and potential risks in a watershed, then developing a management plan. Next, the plan must be implemented. Successful implementation depends on including stakeholders, concerned citizens, and effective leadership.

Watershed Management

The Cheney Lake-North Fork (N.F.) Ninnescah project is a good example of local watershed leadership to protect water quality. It began in 1992 when the Reno County Conservation District board and ASCS (FSA) committees met for a goal setting meeting. A Task Force was organized with many agencies and organizations representing local, state, and federal interests involved. A Citizens Management Committee of residents was named as a governing board for the watershed.

Those who had the vision, took action, and organize the Task Force; Task Force members; and the Citizens Management Committee have given valuable service to their community. The precedent taken to protect water quality in this watershed is a notable example. This action will have long-lasting water-quality benefits not only for Cheney Reservoir but also for South Central Kansas, especially the City of Wichita and other communities that draw drinking water from Cheney.

N.F. Ninnescah Watershed

The N.F. Ninnescah Watershed drains east toward Wichita. Surface-water runoff collects in small drainages, combines into creeks, and finally into the N.F. Ninnescah River. Since the 1870s, the region has been a highly productive agricultural area. It supports thousands of families and seven small towns.

About 14 miles above the confluence with the South Fork, where Sedgwick, Kingman, and Reno Counties meet, the Cheney Dam forms the reservoir. The reservoir, a project of Bureau of Reclamation, provides public-water supply, wildlife habitat, recreation and flood control. It is an essential water supply for Wichita and surrounding areas in Sedgwick and Butler counties, supplying more than half the water for more than 340,000 people.

Nonpoint sources, resulting from land-surface runoff, contribute about 99 percent of the pollution to Cheney Reservoir. The watershed that drains into the lake (633,450 acres, 990 square miles) is more than 97 percent agricultural. Seven towns with 3,300 people occupy 0.3 percent of the watershed area. Roads, railroads, and pipelines cover less than 2 percent of the area.

Reservoir Water Quality

Wichita has experienced taste and odor problems in water taken from the lake. The cause of the

impaired water quality is blue-green algae that grows in lake water. Phosphorous levels of more than 0.1 mg/L are believed to be the largest contributor to algae formation.

Project Water Quality Goals

The project, using computer water quality models, has set goals for streams entering the lake (see Table 1). These goals will protect lake water quality and should reduce algal growth.

A sediment load of 80 acre-feet per year and a useful life of 100 years were used for design of the structure. Actual sediment yield has been less than 80 acre-feet per year. The Task Force established a goal to reduce the sediment load by 40 percent. It is hoped that this will double the lake life.

Table 1

Stream Water Quality Concentration Goals (mg/L)

	P	NO ₃	BOD	TSS
Mean Flow	0.1	1.2	3.0	100
Base Flow	0.05	0.25	2.0	20
Runoff Event	0.4	6.6	8.7	550
Fecal Coliform: less than 200 colonies/100ml				

P=Phosphorous; NO₃=Nitrate; BOD=Biochemical Oxygen Demand; TSS=Total Suspended Solids

Project Plan

These watershed goals are expected to be reached by installing the following practices:

- Control runoff water from all animal confinement areas in the watershed.
- Retain 60 percent of grasslands seeded through Conservation Reserve Program (CRP).
- Use conservation tillage to increase minimum residue levels to 20 percent on all cropland.
- Install terraces and waterways on 2/3 of steeper lands in the East Ninnescah area.

