

PROTECTION OF WATER QUALITY IN MOUNTAIN STREAMS: OVERVIEW

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The purpose of this panel discussion is to describe how the water quality of New Mexico's high mountain streams is protected. By summarizing the variety of multidisciplinary activities undertaken by the Water Pollution Control Bureau with respect to one particular river, both the complexity of the problems involved and the various policies, regulations and programs employed will be presented.

The Red River in northern New Mexico was selected for discussion because there are both municipal and industrial discharges to the river and because it is a typical high mountain stream. The Red River's headwaters lie in the Sangre de Cristo Mountains in Taos County (figure 1). The river flows for some 27 miles, from an elevation above 9,500 feet to an elevation of 6,500 feet at its confluence with the Rio Grande. The river's total drainage area is 190 square miles, much of which is in the Carson National Forest.

The upper mountain watershed of the Red River is forested by aspen, spruce and fir. Reproducing populations of cutthroat, brook and brown trout inhabit its upper reaches. Rainbow trout are annually stocked in the river by the town of Red River and the New Mexico Game and Fish Department.

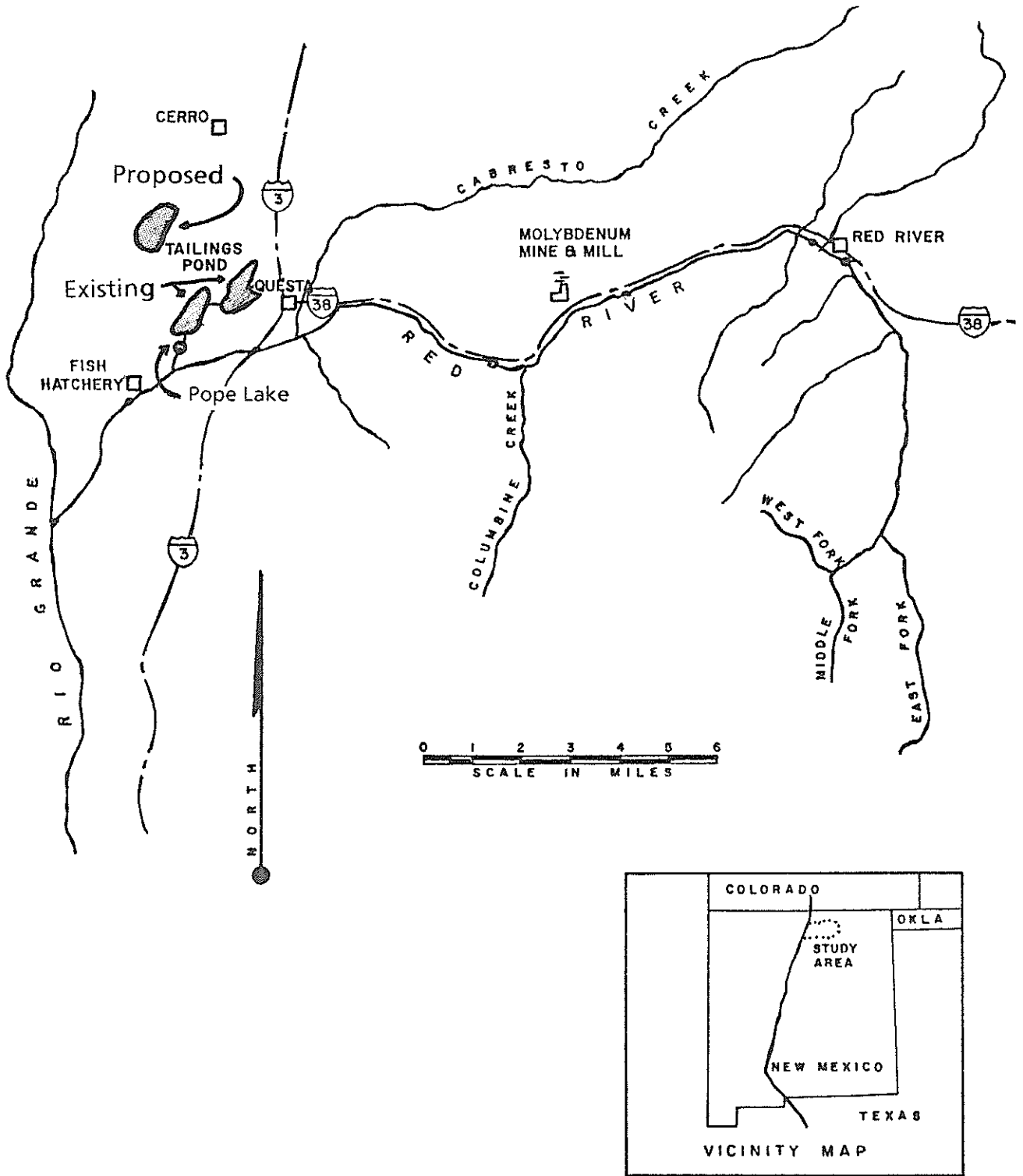


Fig. 1. Location Map

There is an intensive development of private lands for summer homes along a six mile reach of the river above the town of Red River. The lower piedmont valley, in the vicinity of the village of Questa, supports traditional family agriculture. Between the towns of Red River and Questa is located the Molybdenum Corporation of America, or Molycorp, mine and mill. The mill's tailings slurry is conveyed by pipelines along the Red River Fish Hatchery, operated by the New Mexico Game and Fish Department.

In order to protect the water quality of New Mexico's rivers, the State Water Quality Control Commission, which is by state law the official water pollution control agency in New Mexico, first determines the designated uses to be protected for a specified stream reach. Then the commission establishes numeric and narrative criteria to protect these uses. As one of the constituent agencies of the commission, the Environmental Improvement Division (EID) has been delegated by the commission to implement several specific programs aimed at ensuring that stream standards are maintained and that the water quality of each stream is protected for these designated uses. These programs are effectuated by the Water Pollution Control Bureau.

Because of its natural conditions, the Red River has been divided into two segments for the purpose of protecting its water quality. The first segment extends from the river's confluence with the Rio Grande to about 1-1/2 miles above the fish hatchery; the second extends from that point, upstream to its headwaters. The upstream reach of the Red River includes designated uses of irrigation, domestic water supply and high quality coldwater fishery. For these reasons, the numeric water quality

standards that apply to this upstream reach are more extensive and more stringent than those for the downstream segment.

By monitoring stream water quality and by using these stream standards as a guide, the bureau establishes both limitations on discharges of wastes into the Red River and monitoring and enforcement procedures to make sure these limits are not exceeded. One method used to impose these discharge limitations is the federal National Pollutant Discharge Elimination System permit program, commonly referred to as NPDES permits. To illustrate how the discharge of contaminants is controlled, this panel will briefly review the history of bureau activities affecting two discharges to the Red River. The town of Red River and the Molycorp discharges are used as examples of the multiprogram process of bureau water pollution control activities.

One of these programs, the Engineering and Construction Grants Program, assists in reviewing and funding publicly owned treatment works. For example, the town of Red River received a 30 percent federal grant to assist in constructing a \$235,000 wastewater treatment system in 1968. The town finished construction of stabilization ponds with supplementary surface aeration in late 1972. The effluent from the treatment plant was discharged to the Red River. However, major amendments to the Federal Clean Water Act adopted in 1972 included more stringent requirements for municipal wastewater discharges than the just completed Red River plant was designed to meet. So the town began the process of obtaining a new construction grant.

The purpose of the federal and state wastewater treatment construction grant program is to assist communities in meeting water pollution

control responsibilities. The federal government, through the U.S. Environmental Protection Agency (EPA), presently provides 75 percent of the total eligible project costs. For 10 years now, the state has provided an additional 12-1/2 percent of the project costs and these funds are administered by the EID. The city must provide the remaining 12-1/2 percent of the project costs. Along with the federal dollars, as usual, come numerous regulations and detailed planning and design requirements which make the grant process complex and time-consuming.

These requirements, however, are designed to ensure that the grant recipient has the ability to finance, operate and maintain the system once it is built, and to ensure that by analyzing various alternative treatment systems in the detailed planning phase, the most cost effective, appropriate technology for the specific municipality's wastewater treatment needs is selected.

The town of Red River is a good example of how this process, even though it can take many years, can also result in a less expensive and more efficient wastewater treatment system. The town received a grant for planning a new treatment plant in 1974. After the planning phase, a new plant was designed; but, because in 1977 all the bids for construction exceeded available grant monies, construction was delayed. Bureau engineering staff questioned the treatment efficiency of the proposed plant and after intensive engineering review by the bureau, the EPA and a team of independent consulting engineers, the plant was redesigned.

In 1981, the town was awarded a \$4 million federal grant and a \$680,000 state grant to construct the first advanced wastewater treatment plant in New Mexico. The new plant, now 90 percent complete, provides

for normal secondary treatment for about nine months of the year. During periods of high plant flow and low streamflow, about three months of the year, the stream standards for ammonia and phosphorus would be exceeded without the additional, advanced treatment provided by the new plant.

In designing this treatment plant, the most critical consideration was determining appropriate effluent quality limitations which would preserve stream quality and protect designated uses while minimizing construction and operation costs.