

PANEL

Federal Water Quality Information Responsibilities, Activities and Needs

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Most of you may be aware of the U.S. Bureau of Reclamation's function in this part of the country. We were established under the authority of the 1902 Reclamation Act. We function in the 17 western states in water resource development. In developing these water supplies, we have to look at water quality which is a very important and integral part of all our planning process. Our water quality studies vary in complexity depending on the proposed use of the water, its source, and how it will be transported to the point of use. Generally, as we complete our planning studies we get more sophisticated in determining water quality. Today, I will concentrate primarily on what the U.S. Bureau of Reclamation is doing in New Mexico. We perform water quality investigations to determine the usability of water for irrigation, municipal and industrial purposes, and we assess the quality conditions for these purposes. In doing that, of course, we have to look at not only the quality of ground water, sub-surface flows and return flows, but also at the instream uses and the resulting water that goes into a reservoir system. The quality of return flows within a project service area is an important consideration in all of our studies. In looking at the quality of return flows, we consider on-farm uses, the return flow from irrigation and the return flow from underground that reaches a particular river or drainage system. We also

look at municipal and industrial return flows, urban runoff, and runoff and return flows from fish and wildlife refuges. When we are studying water in the project service area, we try to determine the quality of that water, its impact on the project we're studying, and of course, its use once we complete a project. Today I'm going to dwell on some of the things we've been looking at in New Mexico. The first one is a 1976 feasibility study of the potential for water resource development for Raton, New Mexico. This particular study looked at two alternatives. One was a diversion from the Cimarron River and the other was ground water in the Capulin Basin. We determined that these would be the two best sources for Raton's water supply. Before we progressed very far in that study, we looked at the water quality of these two sources. Our studies of the diversion from the Cimarron River revealed that there really was no major primary or secondary drinking water parameters which exceeded the drinking water requirements at that time. Although the study revealed some coliform bacteria in the Cimarron about eight miles downstream from Ute Park, by the time the bacteria reached Raton, the bacteria count met the state standards which, of course, also brought the water within the Environmental Protection Agency's (EPA) standards. We also looked at wells on the Capulin Mesa and found that the quality of the water in the deposits would be chemically suited for use as a public supply. After we finished our studies, Raton took the results into consideration in the final design and the city is now in the process of completing that project.

The Canadian River Project in eastern New Mexico is experiencing water quality problems in the flows that go into Lake Meredith. The lake

is a water supply reservoir for 11 cities in west Texas. Appraisal level investigations of the waters indicated brine contamination in the water supply coming from some place. In 1979, we completed the appraisal which identified some brine aquifers in the area around Logan, New Mexico, about two miles below Ute Reservoir. This identification was made only after we had thoroughly tested the riverbed sands and the subsurface water conditions of the Canadian River and the aquifer. It appears that the aquifer can be brought into control and thereby reduce the salinity of this water supply system. The salinity concentrations of the aquifer are in excess of about 30,000 milligrams per liter. Our plan is to pump the aquifer and dispose of the water. However, we haven't yet decided how to dispose of it. Much of the time, we dispose of the water through evaporation. At any rate, we have been funded this year for a feasibility investigation to continue those studies of the water quality in the Canadian River Project.

In 1980, the Southwest Region of the U.S. Bureau of Reclamation initiated a three year study of the problems, needs and resources of the Tularosa Basin here in New Mexico. We found vast amounts of ground water reserves, ranging from brackish to fresh, underlying that basin. These reserves provided, of course, a good opportunity for water development and energy related development. Water in nearly all the communities that we studied in the basin contained secondary parameters that exceeded the recommended secondary drinking water criteria for the state of New Mexico and the EPA. The cause of the poor quality water can be blamed on high levels of dissolved solids including calcium, chloride, sodium and sulfates, which result in poor taste, excessive pipe corrosion and increased

treatment costs to make the water suitable for use. We studied several alternatives for improving the water quality to make it usable in the Tularosa Basin. Of course we haven't concluded what the best alternative is at this time, but one alternative we have looked at includes blending the poor quality with better quality water. We also have considered desalting as a possibility, but desalting is very expensive. Also, the investigation of new sites--new wells--is a possibility. If better quality waters were available, communities' purchase of those waters is an alternative.

Communities on the western side of the state near Gallup, New Mexico, are also having problems with their water supplies. Number one, there isn't enough water to provide for their needs and sustain economic growth. Second, although the water in their wells is potable, it's not particularly good. Wells contain high concentrations of manganese, sodium, sulfate and iron and marginal concentrations of the total dissolved solids. In most instances, the concentrations exceed the recommended levels set by the Public Health Service in the Gallup area. Our study, which we call the Gallup-Navajo Project, is aimed at alleviating both quality and quantity problems. The project is looking at a plan to divert water from the San Juan River through about 250 miles of pipeline and some nine pumping plants, and deliver water en route to a number of Navajo communities before reaching Gallup. This study is underway and we're hopeful that we'll be able to complete it in the next few years. This project would provide Gallup with a better quality of water. Not only could they use it as it is with some treatment, but they also could

blend it with some of the more brackish well water, which would increase their supplies.

These are just some of the areas we've looked at in the Southwest Region, particularly New Mexico, over the past few years. Salinity and water quality are continuing problems and experience has shown us in reclamation that it's necessary to completely evaluate the quality of the source water we're going to use in our projects. We've learned from experience during the planning studies, that water quality can change over the years. These changes can be attributed primarily to upstream uses that are increasing the salinity in some streams either by putting return flows into the system or by taking water out. So by experience, we've learned that it's better to do a good job in analyzing the quality of the waters you're going to use in a project before you go ahead and build a project. We've had some instances where we've had to go back in after a project is completed and try to take care of a salinity problem. This has made us very conscious of the need to do a good job of water quality analyses on all our projects.