



## USDA-CSREES 2006 National Water Quality Conference

### Efficient measures for controlling irrigation canal losses in the Rio Grande Project area

Surface water from the Rio Grande is delivered for agricultural and urban uses in the Paso del Norte region by over 500 miles of canals and laterals maintained by two irrigation districts. An unknown quantity of the water delivered by these canals is lost through natural seepage and evaporation. This paper presents methods and results of assessment of the canal seepage losses and opportunities for water conservation through lining canals in both irrigation districts. The objectives of the study were to determine water losses from canal seepage and to assess potential water savings by lining canals and delivery system improvements with the intent of providing information for irrigation districts to prioritize canal lining, optimize the design of lined canals, and conserve water efficiently.

Two different methods were used to measure seepage losses. A ponding test measures how fast water seeps from a specific canal reach into the ground through the canal beds and banks by segregating the selected canal reach, filling it with water and observing any decrease in volume of water over a period of time. The inflow and outflow method involves the measurement of the quantity of water flowing into a particular reach of the canal or river and the corresponding outflow from the same section. Findings from the canals tested show seepage losses ranging from 10% to 30% of the total amount of water delivered. Losses vary significantly from location to location due to different soil types and hydraulic conditions. Ponding test results show water seepage rates from 160 acre-feet to 362 acre-feet per mile along a portion of El Paso's Franklin Canal. However, the current meter inflow-outflow measurements show even higher seepage losses ranging from 884 acre-feet to 1,986 acre-feet per mile for the same section of the canal during the irrigation season. Average savings from lining 10 miles of canals could provide water for as much as 1,000 acres of crops or 8,000 households. The high cost of lining canals reinforces the importance of information provided by this study. These findings have the potential to assist irrigation districts in targeting canals and conservation programs that produce the highest water conservation for available water and financial resources as well as promote efficient sustaining of aquifer lives. Elephant Butte Irrigation District has used pipelines to replace the ditches and laterals, while El Paso County Water Improvement District No. 1 is pilot testing rubber lining.

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