

Gary L. Esslinger is the Treasurer-Manager of the Elephant Butte Irrigation District. Gary is a third generation member of a pioneer farming family living in the Mesilla Valley. He has kept his roots in farming as well as other agricultural based industry. After receiving a bachelor's degree in business administration from Northern Arizona University in 1973, he worked six years in Los Angeles for a large west coast flour milling corporation as office manager. After becoming tired of the city life, Gary returned to the Mesilla Valley and began working for EBID in 1978 where he has been for the past 24 years. Gary began his District career as Purchasing Agent and has held other organizational positions such as Maintenance Chief and Assistant Manager. Gary is, and has been for the past 15 years, the District's Manager and has been the District's Records Manager for the past 2 years. Gary lives in La Mesa on the family farm with his wife, Tina, and three daughters.



J. Phillip King, P.E., is an Associate Professor and Associate Department Head in the Civil and Geological Engineering Department at New Mexico State University. He specializes in water resources engineering, and his research has included hydrology and water quality studies of the Rio Grande. Phil has worked with Elephant Butte Irrigation District since 1991 in the development of flow monitoring systems and organizational infrastructure to allow the District to monitor and control its water supply more effectively, and he provides technical support for mediation on area water issues. His B.S. in civil engineering is from Berkeley, and his Ph.D. and master's degrees are in agricultural engineering from Colorado State. Phil served as a Peace Corps volunteer in Malawi.



CURRENT TECHNOLOGY RELATED TO DROUGHT AND IRRIGATION

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ABSTRACT

The Rio Grande Project in Southern New Mexico and West Texas, for the first time in nearly a quarter of a century, is facing a water supply reduced by drought. As the inflow to Elephant Butte Reservoir fails to meet even pessimistic forecasts, Elephant Butte Irrigation District (EBID) is implementing its drought response with the objective of minimizing adverse effects of drought on farmers and the District's hydrologic health.

While the District has been blessed with a plentiful supply of water in recent years, EBID's farmers and the employees remember the severe drought period of 1951-1978, when allocations to farms dropped below one acre-foot per acre a number of times. Even with the severely curtailed allocation, EBID managed to maintain its cropped area and yield by conjunctively managing the available surface water and groundwater. The District also made very effective use of local storm flows during the drought.

EBID farmers will likely respond to a short water supply by extensive pumping of groundwater. However, with the City of El Paso relying on surface water for over half of its municipal and industrial (M&I) supply, and U.S. treaty obligations to Mexico, there is much more pressure for accountability on the part of irrigators now than during previous droughts, and the District is developing a System Control and Data Acquisition (SCADA) system to facilitate conjunctive use of surface and groundwater.

One important aspect of the District's drought response is its coordination with downstream users to maximize the utility of releases from Project storage. El Paso County Water Improvement District No. 1 (EPCWID) and the Republic of Mexico both take water from the Rio Grande downstream of EBID, and it is in the interest of all three parties to plan releases to allow one user's water to "ride" on the water of other users. Prompt reaction to capture and use storm runoff will also make more water available to all users.

The District is developing individual turnout

measurements for surface water deliveries to farms. Based on the hydraulic control of the existing turnout gate, the District Engineer has developed a rating equation for Armco gates that uses the differential head across the turnout and the gate opening area. Electronic sensors for these state variables transmit data through a radio telemetry system to EBID headquarters, where they are stored in a database and are accessible through the web.

A low-cost instrument for measuring groundwater withdrawals, dubbed the Mag Tube, is under development by EBID. The instrument is a type of Pitot tube monitored with pressure transducers. The calibration of the instrument is under way, and it promises to be affordable and sufficiently accurate, and will produce real-time data that can be integrated with EBID's existing flow and water quality databases.