

COMPUTER MODELING

Reservoir Routing and Water Rights Analyses

City of Florence - Water Master Plan

In 1995 and again in 2001, Martin and Wood sub-contracted to The Engineering Company in Fort Collins to conduct an analysis of the adequacy of the Florence Regional Water System's water supplies to satisfy future water requirements.

One of the Regional System's water supplies is the Florence-Coal Creek-Williamsburg Reservoir (aka Oak Creek Reservoir), decreed in 1982 in Case No. 80CW92 for 2,250 acre-feet, conditional, from Oak Creek and the Arkansas River. In a companion case (80CW93), the Water Court approved a change in the City of Florence's interest in the Union Ditch and in four other water rights belonging to Florence and to the Towns of Coal Creek and Williamsburg. In Case No. 80CW93 the Water Court allowed storage in Oak Creek Reservoir of portions of these five water rights when such rights were not needed for direct use by the Regional System.

Martin and Wood's task began by determining which of the Regional System's members' water

rights were needed for direct supply and which weren't needed for direct supply and therefore could be stored. Martin and Wood created a FORTRAN program to accomplish these tasks and to allow for quantification of those water rights to be stored in Oak Creek Reservoir.

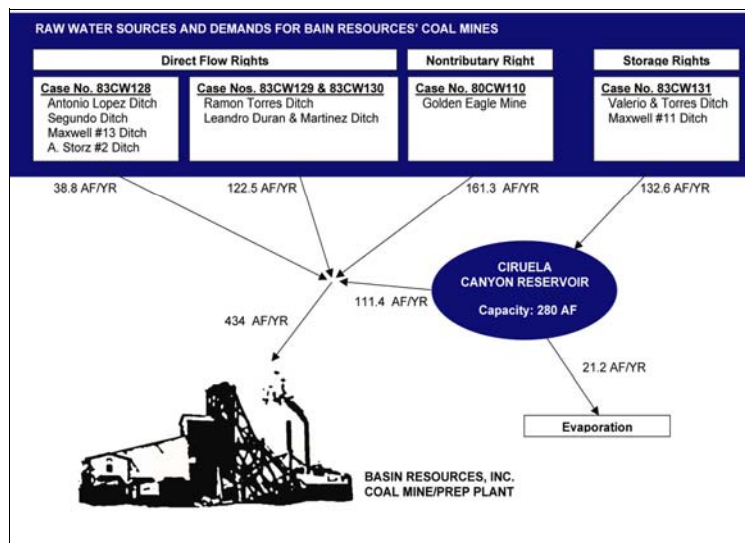
The FORTRAN computer program operated during the 1971-1994 study period by first satisfying the Regional System's municipal needs with direct flow rights, storing the unneeded rights in Oak Creek Reservoir, storing the infrequently available flow from Oak River and from the Arkansas River in Oak Creek Reservoir, and last, taking water from Oak Creek Reservoir when the direct flow municipal water rights would be insufficient to satisfy the Regional System's direct, or immediate, water needs.

Martin and Wood concluded in the 1996 Master Plan and in its 2002 update that the construction and use of Oak Creek Reservoir would significantly enhance the Regional System's firm yield.

Basin Resources, Inc. - Raw Water Supply Reservoir

In 1991, Basin Resources, Inc., acquired and began to operate two coal mines on the Purgatorie River west of Trinidad, Colorado. Analyses of the water rights acquired by Basin Resources indicated that while the total average annual yield of the several water rights acquired was sufficient for the mines' needs, the dry-year supply would be inadequate.

Martin and Wood then integrated the yield available from Basin Resources's direct flow rights with the supply derivable from storage of Basin Resource's storage rights and recommended the size of the proposed reservoir which would result in a dependable water supply in all years.



Water balance for Basin Resources Coal Mines

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