WATER MARKETING AND THE BUREAU OF RECLAMATION

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Seeking greater efficiency of water use has become one of the hallmarks of current discussions of water supply management. In most urban areas, public utilities either initiate or are drawn into discussions of water conservation, system optimization, and efficient pricing. In terms of water supplied by the Bureau of Reclamation, the federal agency charged with building major federal water supply facilities in the 17 western states, the potential for such measures has only begun to be explored, although it was emphasized at least as far back as the report of the National Water Commission in 1973 (U.S. National Water Commission, 1973). The subject is likely to receive increasing attention simply because of the vast federal resources already in place. The Bureau of Reclamation controls major storage and conveyance facilities in the western states, which in 1986 supplied more than 30 million acre-feet of water--27 million acre-feet for irrigation, 3 million acre-feet for municipal and industrial uses, and another million acre-feet for additional uses, as well as providing hydropower production, recreational opportunities, and flood control. To the extent that conservation can be achieved inexpensively, existing Bureau of Reclamation supplies represent a tremendous resource—both in terms of salvaging unused return flows and in reallocating water to uses with higher economic returns. For example, the Imperial Irrigation District (IID) in southern California diverts up to 3 million acre-feet annually from the Colorado River, more than 20% of the total net diversions from the river. Conserving *15%* of this water would yield 450,000 acre-feet--an amount equal to the projected growth in demand to the year 2000 of the Metropolitan Water District of Southern California (MWD), which serves 27 member agencies on the Southern California coastal plain.

In fact, two recent agreements between the MWD and the Imperial Irrigation District present a dramatic example of these conservation possibilities. In late 1988 MWD struck an agreement with IID to fund conservation measures that would salvage 100,000 acre-feet of water annually for municipal and industrial uses in the MWD service area. Under the agreement, MWD will pay IID $92 million for the construction of conservation facilities, $3.1 million annually for operation and maintenance, and $23 million in five annual installments for indirect costs. Under a separate arrangement, concrete lining of the All-American Canal (which carries water from the Colorado River to IID) will conserve another 70,000 acre-feet of water for use by MWD. Studies by the Bureau of Reclamation and the State of California estimate that there are up to another 250,000 acre-feet of water conservation investments in the Imperial district that could serve as the basis for future agreements (see Wahi and Davis, 1986). Agreements of this type, involving water already under contract, have come to be called “voluntary water transfers” or “water marketing.” Voluntary water transfers can be either short-term leases, annual rentals, long-term leases, dry-year option agreements, or permanent sales.

There are several reasons to believe that water transfer agreements, along with improved

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system optimization, are likely to become the principal vehicles for improvements in the efficiency of use of federally supplied water, rather than pricing or mandatory conservation measures. . The roots are historical. When the Bureau of Reclamation was established in 1902, its primary goal was a social one--the settlement of the arid west with small family farms, originally limited to 160-acre ownerships. Repayment to recover costs was secondary, as reflected by the fact that repayment for irrigation investment was interest-free over 10 years. When many of the original projects ran into additional difficulty (such as poor soils or inadequate drainage) or encountered problems with repayment, the federal response was to increase expenditure to solve the problems, combined with easing the repayment terms. Eventually this lead to legislation authorizing interest-free payment over 50 years for irrigation, further reduced in some cases to the growers "ability to pay." This means that, on average, irrigation districts repay only about *15%* of the cost of the irrigation investments on a present-worth basis. Furthermore, these financial terms are written into long-term Bureau contracts with water users and are not subject to much change or adjustment.

Therefore, the Bureau's water pricing differs substantially from that of a publicutility. Utilities base their water prices on the cost of investment, plus a rate of return and, after approval by a regulatory commission, rates change periodically. One other difference is that the Bureau is a water wholesaler that contracts with water districts, rather than final consumers (household or farms). Of course, districts could price water more efficiently to their consumers, but in the absence of state regulation of those districts, the forces against this are considerable because the charges for water to Bureau districts is low. Therefore, the avenue of pricing reform for federal water at the level of federal contracting is virtually closed in most instances. On the other hand, the fact that the Bureau has long-term contracts for large blocks of water with a relatively small number of districts, rather than adjustable rates to thousands of final consumers, means that re-marketing of supplies between these districts is a much more viable possibility than resales between customers of the average public utility. Transfer between Reclamation districts or to other districts would be analogous to transactions among public utilities. (Similar transfers have been discussed among the water districts served by California's State Water Project.)

Mandatory conservation measures have been incorporated into building codes in urban areas. However, similar measures have not taken hold on irrigated lands served by the Bureau of Reclamation, even though districts are required by 1982 legislation to submit conservation plans to the Bureau. This is probably due to several factors, including the low price of water, the lack of specific standards and enforcement measures on the part of the Bureau, and the inability of farmers to finance more expensive conservation measures. The IID to MWD transfers illustrate that financing of conservation measures by parties outside an irrigation district can overcome all of these obstacles.

There have, in fact, been a number of transfers involving Reclamation water users in the past (for additional detail, see Wahi and Osterhoudt, 1986). Water rentals in the system of federal storage reservoirs on the Upper Snake River in Idaho stretch back to the 1930s and were explicitly recognized in the Bureau of Reclamation's contracts with water users. In 1980, the Idaho legislature gave further backing to such arrangements by authorizing the state to operate water banks. In 1972, the Utah Power and Light Company obtained 6,000 acre-feet of water from two irrigation companies in the federal Emery County project for power plant cooling. The City of Casper, Wyoming, is paying the nearby Casper-Alcova Irrigation District for canal lining on portions of the district's fifty-nine-mile canal and 190-mile lateral system in order to reduce seepage. The exchange is intended to provide the city with 7,000 acre-feet of water. During the 1976-77 drought in California, the

Bureau of Reclamation operated a water bank in which some 45,000 acre-feet of water changed hands for total payments of $2.2 million. In the Ft. Collins area, there is a highly organized market operating in the Northern Colorado Water Conservancy District, in which water from the Colorado Big Thompson Project is exchanged at market value. Share prices for permanent rights to Colorado-Big Thompson water (expressed in 1980 dollars) rose from $99 per acre-foot in 1961 to over $2800 per acre-foot in 1980, although prices have declined considerably since that time.

There is reason to believe that the number of transfer requests will increase in the future.

(1) Water rights on Bureau of Reclamation projects are obtained under state law, and over the past decade many western states have modified their water codes to facilitate transfers of water (Idaho in 1981, California in 1982, Oregon in 1987), and similar legislation has been introduced in other states, such as Washington in 1987 and 1988.

(2) Accompanying these changes in state law and because of increasing competition for water, there has been a growing number of water transfers in the western states (for a discussion of dozens of transfers in the southwestern states, see Saliba and Bush, 1987, or the Water Market Update newsletter published by Shupe and Associates, in Santa Fe, New Mexico).

(3) In 1986 and 1987, the Western Governors' Association (WGA) focused attention on water efficiency and issued reports suggesting further changes in both state and federal law and policy to facilitate transfers (Western Governors' Association, 1986 and 1987).

(4) Concern over reducing the federal budget deficit has limited federal financing for constructing new projects. Requirements for higher levels of nonfederal cost-sharing for new projects began focusing more attention on better allocation and use of existing supplies.

(5) In September, 1987, the Bureau of Reclamation issued a report entitled Assessment '87 which indicated that

> The Bureau's primary role as the developer of large federally financed agricultural projects is drawing to a close.... The Bureau of Reclamation must change from an agency based on federally supported construction to one based on resource management.

The report goes on to discuss some ways in which the Bureau could facilitate more efficient resource management, including developing a water marketing policy to allow contractors to sublease water at a profit. The report also highlights improved systems analysis of multi-reservoir systems to enhance their dependable yield, nonfederal operation of Bureau facilities, transfer of title of facilities to water districts, and increased roles in the areas of groundwater management and water quality.

(6) In December, 1988, the Department of the Interior responded to the July, 1987 WGA report by issuing a set of principles designed to guide Bureau of Reclamation review and approval of water transfer requests. Under these principles the Bureau is directed to facilitate transfer proposals brought to it by interested water users, provided the transfer complies with state law and injures no third parties. Most important, the Department policy will allow districts to profit from transfers, once federal costs are paid. This latter provision results from a recommendation contained in the WGA's report that it was necessary to have an economic incentive to facilitate transfers of federally supplied water. For those transfers from agricultural to municipal and industrial use, the Bureau of Reclamation would also receive increased revenues since municipal and industrial use carries interest charges under Reclamation law, but irrigation use does not. The Department's water transfer principles are designed to standardize Bureau of Reclamation policy from one project and region to another. For example, in the Central Valley Project in California, increased income to a district reassigning its

contractual deliveries had previously been prohibited as a matter of policy, although it is not a provision of Reclamation contracts or Reclamation law. In the Central Arizona Project, profit on transfers between districts had been virtually ruled out by the contracts themselves (for additional background on this policy, as well as other contractual and legislative reforms that could further facilitate transfer of federally supplied water, see Wahi, 1987 and 1989, and Western Governors' Association, 1987).

The new orientation by the Bureau toward more efficient management of existing resources should set off a new round of applied research, as well as increased water trading activity, because it raises a number of practical questions as how best to utilize water from existing facilities. Trading water holds considerable potential to enhance efficiency for those water uses traditionally subject to contract--municipal and industrial uses, irrigation, and hydropower. However, increased trading activity will also place continued responsibilities with state and federal governments for protecting instream uses of water for recreation and fish and wildlife purposes, purposes for which water is not traditionally marketed. Although in some states, purchases of or donations of water for instream uses may come to be one vehicle for supplementing instream flows, government regulation and protection of instream flows is. likely to call for evaluations of water for these purposes as well.

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