# Going with the Flow: Marketing Instream Flows and Groundwater

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In the past decade there has been a remarkable shift in the economic thinking about the efficacy of water marketing. In the past because of a deep suspicion of markets, "the general tendency in institutional development [regarding water] has been to modify market procedures or completely replace them."[1] That attitude, however, is giving way to policy reforms that emphasize the use of voluntary water trading; "regulatory and pricing measures can be contrasted with what promises to be a more effective approach, namely facilitating voluntary market transfers of water."[2] Until recently it has been assumed that third party effects and problems of public goods have limited the utility of water markets. Frank Trelease, a leading legal scholar on water institutions, concluded that objections to water marketing result from exaggerated defects in the prior appropriation system, "a dislike of the property system, . . . a mistrust of the market system" or "a dislike of the priority system . . . . To a large extent these objections are based on a lack of understanding—a failure to appreciate the flexibility and variety of operational methods available under controlled appropriation laws."[3] As Willey and Graff point out, this lack of understanding is giving way to increased attention and reliance on the market process.[4] In stressing the need of the western United States to adjust to the new realities of water allocation, former

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1. L.M. HARTMAN & D. SEASTONE, WATER TRANSFERS: ECONOMIC EFFICIENCY AND ALTERNATIVE INSTITUTIONS 3 (1970).

2. R. W. Wahl, Voluntary Market Transfers of Federally Supplied Water (February 13, 1987) (unpublished paper presented at the symposium "Evolving Issues in Water Policy: The Agricultural Connection," sponsored by the Congressional Research Service).

3. F.J. Trelease, *Alternatives to Appropriation Law* in WATER NEEDS 60 (V.P. Nanda ed. 1977).

4. Willey & Graff, *Federal Water Policy in the United States: An Agenda for Economic and Environmental Reform*, this volume.

Colorado governor Richard Lamm described the change that has taken place:

> When I was elected governor in 1974, the West had a well-established water system . . . . Bureau [of Reclamation] officials and local irrigation districts selected reservoir sites and determined water availability. With members of the Western congressional delegation, they obtained project authorization and funding. Governors supported proposals, appearing before congressional committees to request new projects, and we participated in dam-completion ceremonies. . . .
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> In 1986, the picture is quite different. The boom in western resources development has fizzled, though tourism remains an economic mainstay . . . . Congress, including members of the western delegation, has to worry about how to cut spending, not which [water] projects to fund . . . . Farmers are trying to stay in business and are recognizing that their water is often worth more than their crops. Policy-makers recognize that the natural environment must be protected because it is a major economic asset in the region.[5]

Even the Bureau of Reclamation has recognized political reality regarding dam construction and is placing more emphasis on increasing the efficiency of existing water use. Recently it even went so far as to open an Office of Water Marketing.

The revolution in water marketing concepts both intellectually and at the policy level has focused primarily on the allocation of offstream diversions rather than on instream flows or groundwater. Given that the prior appropriation system which dominates western water law evolved to accommodate offstream uses, this is hardly surprising. By the same token, the forces of scarcity which necessitated the shift from the riparian system are beginning to appear with respect to instream flows and groundwater.[6] The management of instream flows was once restricted to the maintenance of flow levels sufficient for navigation and power generation, but today such management encompasses the allocation of a broad range of stream uses. Adequate instream flow levels are required to sustain fish and wildlife habitats, to mitigate damage from water pollution, and to provide recreational opportunities. With groundwater use increasing steadily over the last 40 years, basin depletion is raising pumping costs and causing subsidence. With our increased understanding and use of water

5. Lamm, *Foreword* to B. DRIVER, WESTERN WATER: TUNING THE SYSTEM ii (1986).

6. For a discussion of this evolutionary process, see Anderson, *Institutional Underpinnings of the Water Crisis*, 2 CATO Journal 759 (Winter 1982).

marketing for offstream allocation, it is time to extend the market paradigm to the tougher problems of instream flows and groundwater.

## Instream Flows

Originally the instream flow issue concerned only the maintenance of flow levels for navigation and power generation, but today's concerns are related to a broader range of stream uses including waste disposal, fish and wildlife habitats, and recreational activities. As Willey and Graff[7] point out, such uses increased in value from an economic standpoint; the problem, however, is that the existing institutional structure does not reflect these values.

Under the prior appropriation system, water ownership is defined in terms of diversion and consumption; water left flowing in the stream becomes available to downstream diverters. For example, when a Montana rancher offered the Montana Land Reliance a conservation easement in a diversion water right on the Madison River if the group would leave the water instream, their lawyer discovered that the easement would be of little value since the water would be considered abandoned under Montana water law. This "use it or lose it" principle eliminates any incentive for water owners to provide instream flows.

Hence in the absence of private property rights to water left instream, the political process must be relied on to provide adequate instream flows. Such efforts predictably collide with traditional agricultural, industrial, and municipal uses which compete for diversions. If political units reserve water for instream purposes, offstream users lose access to a potentially valuable asset and therefore oppose such reservations. This becomes especially true in states where there is little surplus water, i.e. where streams are fully appropriated for diversion. As a recent report of the Western Governor's Association notes:

> States are reluctant to try to use their power to regulate to protect and enhance instream flow values on such [fully appropriated] streams because to do so may invite litigation. Additionally, where states have the authority to acquire [through purchase] existing water rights and to transfer them to instream flow rights, this authority has not usually been exercised because of budgetary constraints . . . . The gap in protec-

7. *See* Willey & Graff, *supra* note 4.

> tion of instream flows on streams approaching full allocation and the absence of protection of these flows in some states, together with water code provisions that encourage consumptive uses, leave instream flows only partially protected in western states.[8]

Given the difficulties of using the political process to reserve instream flows, it is appropriate to ask whether water marketing can help resolve some of the conflicts. If any market is to work, it is necessary that property rights be defined, enforced, and transferable. Economic theory can be used to show that a market for instream flows will not efficiently allocate water between instream and offstream uses because instream use rights cannot be defined and enforced; in other words, provision of instream flows is subject to the free rider problem.[9] Some economists simply assume that property rights in a natural resource such as instream flows cannot be defined and enforced, but the fact is that individuals will undertake establishing property rights when it is in their economic interest to do so. As the value of instream flows rises and the technology for monitoring water use improves, the likelihood of having instream flow rights increases. A comparison between instream flows and nineteenth-century grazing land is illustrative.

> Sophisticated technologies of streamflow monitoring can serve the law in insteam flow rights just as the technology of barbed wire served the nineteenth-century law of private rights in grazing land. Defining the parameters of a right to instream flows is no more difficult than defining the parameters of a right to divert water for agriculture or industry.[10]

Based on the free-rider argument that there is a *potential* for market failure, however, most states have not allowed private instream flow claims. The resulting problem is that the possibility of innovative private contractual arrangements by conservation groups like Trout Unlimited and The Nature Conservancy may be thwarted.

The problem created by the inability of private parties to contract for the provision of instream flows can be seen, for example, on the Ruby River, a blue ribbon trout stream in southwestern

8. *See* B. DRIVER, *supra* note 5, 33-34.

9. For a complete discussion of the land and economics of instream flow regulation, *see* Anderson & Johnson, *The Problem of Instream Flows*, 24 ECONOMIC INQUIRY 535 (October 1986).

10. Huffman, *Instream Uses: Public and Private Alternatives* in WATER RIGHTS: SCARCE RESOURCE ALLOCATION, BUREAUCRACY AND THE ENVIRONMENT 275 (T.L. Anderson ed. 1983).

Montana. During the spring of 1987 withdrawals for irrigation by senior rights holders reduced instream flows sufficiently to cause a major fish kill. To have prevented the kill, the flow of the river would need to have been increased by only 150 cubic feet per second for a few days. The Department of Natural Resources and Conservation eventually negotiated an increase in the flow but it was too little too late. If an organization like Trout Unlimited could have purchased or rented a relatively small amount of the low-valued water standing in the fields, the farmers would have had an incentive to compare the value of water for irrigation to the value for trout habitat. By allowing private ownership of instream flows, a catastrophe could have been avoided, water could have been conserved, and cooperation between fishermen and farmers could have replaced conflict in the political arena. Unfortunately, the laws of Montana stood in the way.

Rather than advocating private instream flow rights, environmental and recreational interest groups are attempting to use the public trust doctrine to preserve stream flows and open access. The basic idea of this doctrine is that the public possesses rights superior to any private claims. Thus private rights are subordinate to public rights which are held in trust by the state. Initially this doctrine made sense when applied to commerce on navigable rivers and coastlines, but its extension to instream flows[11] and to recreational access[12] are only likely to generate more conflicts with diversion uses and reduce incentives to leave water instream. Reliance on this doctrine has prevented markets for instream flows from evolving and has ensured that even markets for diversions will be clouded by the uncertainty of private tenure inherent in this doctrine. The time has come to make the marketing of instream flows possible by allowing the private establishment and enforcement of instream flow rights. In this way these valuable uses will be able to compete with more traditional diversions.

A positive alternative to the public trust doctrine and to public reservations of instream flows would be to allow private individuals and groups to purchase water from diverters or to claim limited amounts of unclaimed water where streams are not fully appropriated. State laws could be amended to allow retirement

11. *Nat'l Audubon Soc'y v. Superior Court of Alpine County*, 33 Cal. 3d 419, 658 P.2d 709 (1983).

12. *Montana Coalition for Stream Access v. Hildreth*, 684 P.2d 1088 (Montana 1984).

of prior appropriation rights so that water would be left in streams where upstream diversions create critically minimum flows. These diversion rights could be donated to or purchased by environmental groups who could in turn resell the rights to diverters below critical flow points. Such donations or purchases would only be necessary on streams which are fully appropriated. On streams with unappropriated water, private individuals or groups could be allowed to establish claims under the rules of prior appropriation.

A potential problem with this proposal is that claimants could appropriate all water flowing past a given point, and block upstream transfers of diversion rights. Thus, a downstream farmer could move his diversion above the instream flow claim, causing total instream flows to decline. The instream flow claimant would be impaired and eligible for compensation. If instream flow claims are free, therefore potential claimants have an incentive to use all they can, and existing diverters will resist instream appropriations because of the restrictive effect on water transfers. To prevent excessive instream flow claims and to make the proposal for instream claims politically acceptable, water could be sold by the state or limits on the amounts to be claimed could be imposed.[13] Under this system, legal changes allowing limited private ownership of instream flow claims would greatly increase the options for insuring sufficient flows when those flows are scarce.

## GROUNDWATER

The allocation of groundwater is another area where there has been practically no opportunity for markets to play a role. Before examining market alternatives, it is important to understand the two major problems associated with groundwater allocation. The first is the depletion of stocks in many basins. To many people, the fact that withdrawals exceed recharge is seen as bad, but the relevant economic question is whether depletion is efficient. Efficiency criteria require that water be left in the basin if its discounted future value exceeds the present value. Certainly if the basin is a common pool resource, efficient use over time is unlikely because any water left in the basin will be subject to capture by other pumpers and therefore of zero future value to the per-

13. For a more complete discussion of problems created when instream flow claims leave no unclaimed water, see Anderson & Johnson *supra* note 9.

son who conserves. Overdraft inevitably occurs in the common pool case. However, if property rights to water left in the basin can be established, decision makers will tend to move toward optimal extraction rates.

The second problem is pollution of groundwater supplies. Instances of toxic wastes seeping into subterranean wells and threatening health have prompted the federal government to enact the Comprehensive Environmental Response, Compensation, and Liability Act,[14] better known as Superfund. The legislative price tag for clean-up which rose from $1.6 billion in 1980 to $9 billion in 1986 has been referred to as a "hazardous waste of taxpayer money."[15] Again if property rights can be established, the need for Superfund can be reduced because liability would act to promote prudent disposal of hazardous wastes. Owners of hazardous waste disposal sites who can be held liable will have an incentive to take preventative measures rather than pay for damages they cause.

The infamous case of Love Canal illustrates how a liability standard can work. Chemicals leaking from the dump formerly owned by Hooker Chemical allegedly were responsible for adverse health effects in the 1960s and 1970s. These leaks forced the evacuation of homes near the site and prompted legislative hearings that eventually led to the Superfund legislation. Closer examination, however, reveals that the company used state of the art disposal techniques even in the 1940s. Their concern over potential liability provided the necessary incentive to induce responsible behavior.[16] The chemicals dumped by Hooker remained enclosed until the land was taken over by the city of Niagra Falls which built a school on the site and sold surplus land to developers. Development meant sewers and sewers meant trenches through the toxic waste dump. What Hooker Chemical had tried to prevent because of potential liability, city officials undid because no one was directly accountable. This story should provide an important lesson, but it has been ignored by most policy-makers and environmental leaders.

A system of property rights for groundwater can be patterned after unitization and oil pooling arrangements used to control oil

14. 42 U.S.C. § 9601 *et seq.*

15. F. Smith, "*Superfund: A Hazardous Waste of Taxpayer Money,*" HUMAN EVENTS, 662 (August 2, 1986).

16. E. Zuesse, "*Love Canal: The Truth Seeps Out,*" 12 REASON, 16 (February 1981).

fields. By assigning rights to stocks and flows and allowing transferability, efficiency within groundwater basins can be enhanced. Transferability forces users to face the opportunity costs of alternative uses. There would be greater opportunity to stabilize groundwater levels by allowing exchanges with outside water sources. Finally, with property rights and/or unitization, the owners would have the incentive to watch for and file suit against polluters. Unitization provides an effective arrangement for compelling individuals to act together in pursuing damages in class action suits. This proposal may not completely solve problems of groundwater exploitation and pollution, but it moves us from expensive command and control legislation toward innovative cooperation in the market place.

## CONCLUSION

In order to take advantage of water markets, policy-makers must find ways to define and enforce water rights, make them transferable, and guard against doctrines which erode these three elements. While the prior appropriation doctrine provides many of these elements, the public trust doctrine now being advocated by some environmental groups is eroding them. By limiting the applications of the public trust doctrine; by expanding the applications of prior appropriation to instream flows and to the East where water is becoming scarce; by unitizing extraction efforts and instituting clearly defined property rights to groundwater basins; and by reducing the impediments to exchange, the water allocation system can be vastly improved. The possibility of developing political coalitions to bring about these necessary institutional reforms is enhanced by the fact that water markets can reduce environmental degradation, thereby reducing public expenditures and limiting the role of government in a free society.