

California Water: An Economic Consideration

*Matthew Levinson**

INTRODUCTION

The western United States currently faces significant water shortages in areas of high and growing demand. One obvious solution to this problem is to conserve water and to use it more efficiently. The methods of achieving this goal fall into two categories: market systems, which provide incentives to conserve, and “command” systems.¹ Command systems can either impose an arbitrary standard of conservation, or they can mimic the market. Because water is not purchased in a free market, water use is inefficient. But, attempts to liberalize the market — by facilitating transfers which force users to pay opportunity, rather than acquisition, costs — do not seem to achieve more efficient use. This Comment argues that because the “first best” market solution is an inadequate response to inefficient agricultural uses of water, a limited increase in government regulation designed to mimic the market is the optimal “second best” solution.² More specifically, courts should “penalize” inefficient users by reading efficiency requirements into the beneficial use element of an appropriative water right.

* Third year student, UCLA School of Law; B.A., Cornell University. Thanks are owed to Alison Anderson, Owen Olpin, Robyn Polashuk, Richard Schuler, and Hao-Nhien Vu for assistance at various stages of this paper.

1. See A. DAN TARLOCK, *LAW OF WATER RIGHTS AND RESOURCES* 5-27 (1990) (“Conservation can be achieved both by the creation of incentives for conservation and by mandatory technology-forcing.”); see also Charles T. DuMars & A. Dan Tarlock, *New Challenges to State Water Allocation Sovereignty*, 29 *NAT. RESOURCES J.* 331, 344 (1989).

2. The economic theory of the second-best suggests that government intervention in a market is not necessarily less efficient provided that there is an initial distortion. If there is one distortion in an economy, the “first best” option would be to eliminate that distortion. However, if this cannot be done, an additional distortion might increase aggregate welfare; this alternative would be called the “second-best” option.

Both the uncertainty associated with the current definition of water rights and the inability of the market to eliminate inefficient water use are demonstrated by the current plan to transfer 100,000 acre-feet³ of water per year from the Imperial Irrigation District ("IID") to the Metropolitan Water District ("MWD"). A key issue in the transfer is the status of IID's rights in the transferred water. This issue poses two questions: What are IID's rights under current legal interpretation and what should a transferor's rights be in this and similar cases? This Comment examines these questions.

In responding to these queries about the rights of IID and similar parties, it becomes apparent that market principles are unable to yield better water allocations and that, to the extent greater water efficiency is desired, increased government intervention in the form of a stricter definition of beneficial use is necessary. That is to say, a more exacting standard of water use should be implemented by the State Water Resources Control Board ("SWRCB" or "Board"), the California body empowered to regulate water claims and rights.

I.

STATEMENT OF THE PROBLEM

There are great local shortages of water in the western United States.⁴ This problem confronting western water users exists because sources of water supply do not align geographically with areas of demand.⁵ Furthermore, there is a hydrologic "misalignment." Rainfall is seasonally lowest during the summer and fall when the demand for water is greatest. This difficulty is most pronounced in Southern California where growth is being constrained by limited supplies of water.⁶

3. An acre-foot of water is approximately 320,000 gallons — enough water to cover an acre of ground to a depth of one foot. It is "enough water to flush approximately 60,000 suburban toilets simultaneously." ROBERT H. BOYLE ET AL., *THE WATER HUSTLERS* 135 (1971).

4. See, e.g., Frederick M. Muir & Virginia Ellis, *Unprecedented 7th Year of State Drought Forecast*, L.A. TIMES, Nov. 17, 1992, at A1.

5. In California, "while over 70 percent of the stream flow lies north of Sacramento, nearly 80 percent of the demand for water supplies originates in the southern regions of the state." *United States v. State Water Resources Control Bd.*, 227 Cal. Rptr. 161, 166 (Ct. App. 1986).

6. Jenifer Warren, *Water Shortages May Close Tap on Growth*, L.A. TIMES, Apr. 14, 1991, at A1.

Increased demands for water can be met either by transporting water to thirsty areas, by using local water supplies more efficiently, by generating water through desalinization, or by a combination of these methods. Growth-generated demands for more water historically have been met by new "water-producing" engineering projects (for example, dams, reservoirs, aqueducts, and canals).⁷ But, while water demand continues to grow, the engineering solution is no longer feasible.⁸

The economic costs of producing new water are high. That is, suppliers have been pushed far up on their marginal cost curves — the cheap diversion projects have been built. The "remaining surface supplies of the State that are both developable and uncommitted are relatively small."⁹ Each additional project has a higher cost per acre-foot ("a-f") than the last. That is, smaller streams must be dammed, and entirely new transmission systems must be constructed through more difficult terrain.

Environmental costs are also a barrier to additional engineering solutions. Further projects would harm in-stream uses, such as fish and wildlife, and threaten water quality through increased salinity and pollutants. They also threaten recreational in-stream uses. For example, increased diversions from Owens Valley streams have cut off inflow to Mono Lake resulting in a serious decline in the water level.

Water and water rights transfers driven by economic supply and demand have been proposed as a way to solve the problem of tremendously rising water costs. This solution has gained great popularity with both conservative economists and liberal environmentalists. "Some environmentalists have seized on [market-driven] water transfers as a means of avoiding the need

7. "More than half of all water consumed in Southern California is imported from Northern California or the Colorado River." Muir & Ellis, *supra* note 4, at A24. "For nearly a century, Southern Californians . . . have punched holes through mountains, carved channels in the desert floor, drained distant rivers and lakes and lifted water up steep passes." Marla Cone, *Focus on Sea as Tap Water Stirs Talk of Risk*, L.A. TIMES, Nov. 30, 1992, at A3.

8. "Water economy of the Southwest in the second half of the 20th century is characterized by rapidly rising costs of developing new water resources . . ." BONNIE C. SALIBA & DAVID B. BUSH, *WATER MARKETS IN THEORY AND PRACTICE* 38 (1987). "High costs made it clear that water supplies would not be increased by new dams and canals and that supplies could keep up with population growth only if they could be stretched out." *New Conservation Tool*, L.A. TIMES, Dec. 29, 1988, at B6.

9. Kevin M. O'Brien, *Water Marketing in California*, 19 PAC. L.J. 1165, 1165 (1988); see also Joseph L. Sax, *The Constitution, Property Rights and the Future of Water Law*, 61 U. COLO. L. REV. 257, 257 (1990).

for construction of environmentally damaging dams. At the same time, conservatives are attracted to this market-oriented approach for allocating resources."¹⁰

Market economists propose that it would generally be more efficient to change uses of existing water supplies than it would be to invest in new water generation capital.¹¹ It would be cheaper for urban water users to buy existing sources of water — by paying farmers not to use water or to use it more sparingly — than it would be to build additional dams and canals. If water rights could be traded easily, then water should both shift from lower valued agricultural uses to the higher valued municipal and industrial uses and be used more efficiently as a costly resource. A market approach raises efficiency both by shifting water use to different ends, for example, a shift from agricultural to municipal use, and by encouraging more conservation methods for existing uses. Increased conservation results from a competitive market because if water can be sold, then a farmer using water must consider the market price of water as an "opportunity cost" when irrigating a field.¹² The inefficient uses which can be eliminated through conservation measures are a part of this Comment's focus.¹³

10. Lawrence J. MacDonnell, *Transferring Water Uses in the West*, C616 ALI-ABA 29, 39 (1991). For example, John Krautkraemer, senior attorney at the Environmental Defense Fund in Oakland, said the "group 'has been one of the principal promoters of water transfers over the past decade. We see it as a way to reallocate water from existing uses and promote more efficient water use as an alternative to building new dams.'" David Newdorf, *Environmentalists Laud New Policy*, REORDER, Mar. 4, 1991, at 13.

11. As early as 1960 it was recognized that "[i]n the field of water supply it is possible to find examples in the West where a certain amount of water could produce goods and services more highly valued in the market place if it were shifted from agricultural to industrial uses." JACK HIRSHLEIFER ET AL., *WATER SUPPLY, ECONOMICS, TECHNOLOGY, AND POLICY* 36 (1960). "[I]t is increasingly clear that further reallocation of water from agriculture to domestic and industrial uses will be necessary if the water resources of the West are to be used efficiently." Charles J. Meyers & Richard A. Posner, *Market Transfers of Water Rights: Toward an Improved Market in Water Resources*, NAT'L WATER COMM'N REPORT NWC-L-71-009, at 7 (1971).

12. "Opportunity cost" is the cost of what has been given up by taking one action rather than another. It is measured as the value of a resource in the next best alternative use. ROBERT COOTER & THOMAS ULEN, *LAW AND ECONOMICS* 35, 186 (1988).

13. Conservation is "the reduction of the amount of water consumed or irretrievably lost in the process of satisfying an existing beneficial use achieved either by improving the technology or method for diverting, transporting, applying or recovering the water or by implementing other . . . conservation measures." OR. REV. STAT. § 537.455(1) (1992). Conserved water is "that amount of water, previously

However, opportunity costs are "real" to farmers only if water transfers are possible at a reasonable cost. But, water transfers are hampered by several factors: transaction costs, compliance with the no-injury rule, and a remaining uncertainty in the definition of legal rights to water. Transaction costs include the costs of identifying parties with whom one can deal, and costs of negotiations and legal fees.¹⁴ The no-injury rule requires that water transfers not hinder third-party water rights. This rule is a cost of transfers because of the expense incurred in evaluating the impacts of a proposed transfer.¹⁵

Water transfers are also impeded because water rights are less than certain. Not every entitlement to water is clearly defined. For example, the bounds of the right to conserved water which this paper examines have not yet been completely delineated by the courts and legislature. Purchasers hesitate to buy uncertain entitlements.¹⁶

Some long-range, long-term agricultural-to-urban transfers have occurred despite perceived uncertainties and legal barriers. The transfer most widely noted is the recent agreement between IID and MWD. The IID-MWD transfer illustrates the possibili-

unavailable to subsequent appropriators, that results from conservation measures." *Id.* § 537.455(2).

California uses a similar definition. CAL. WATER CODE § 1011(a) (West 1992) ("[T]he term 'water conservation' shall mean the use of less water to accomplish the same purpose or purposes of use allowed under the existing appropriative right.").

14. See, e.g., SALIBA & BUSH, *supra* note 8, at 7. For example, the negotiations for the IID-MWD transfer extended over a period of five years.

15. One of the barriers to transfers is the difficulty of measuring third-party impacts. States prohibit transfers of water and changes in use which harm third-party water rights holders. See, e.g., WILLIAM GOLDFARB, *WATER LAW* 34 (2d ed. 1988) ("The no injury rule can raise insurmountable obstacles to diversion rights transfers, especially in large watersheds."). Impact reports, which are required by the state, Meyers & Posner, *supra* note 11, at 7, are time-consuming and impose costs which are borne by the transfer applicant. Bonnie G. Colby, *Economic Impacts of Water Law — State Law and Water Market Development in the Southwest*, 28 NAT. RESOURCES J. 723, 734 (1988).

16. To operate effectively, property rights "must be clearly defined and have legal certainty." HIRSHLEIFER ET AL., *supra* note 11, at 235. Sellers often fear losing their future rights if they sell or lease them in the present. Marc Reisner, *The Emerald Desert*, URB. LAND, Sept. 1989, at 24. "Even if water — not water rights — were transferred, and if a city or industry grew based on that water, it could be next to impossible to get that water back." J.K. Hartshorn & Rita S. Sudman, *Water Marketing — A New Option*, W. WATER, Mar./Apr. 1986, at 4, 9. Despite changes in California law making water rights more certain, uncertainty still exists. See discussion *infra* part III.A.

ties and the problems of market driven efficiency through water transfers.

IID is located in Imperial County, east of San Diego, on the Mexican border. It diverts water from the Colorado River westward in the All-American Canal. MWD, located to the north of Imperial County, in Los Angeles, diverts water from the Colorado upstream from IID's diversion point. IID functions primarily as a supplier of water for irrigators in Imperial County. As much as one million a-f of this irrigation water makes its way into the Salton Sea,¹⁷ which is used as "a repository for irrigation runoff waters."¹⁸ Once water reaches the Salton Sea it becomes unusable because of the Sea's high saline content. Much of this water can be conserved before it seeps into the Sea.¹⁹

Under a 1988 agreement,²⁰ IID agrees to undertake conservation measures and make the conserved water available to MWD. MWD agrees to pay for the water conservation program in order to acquire the conserved water.²¹ The measures will conserve an estimated 100,000 a-f per year which will be transferred to MWD for a period of thirty-five years. Some of the less technically detailed measures include canal lining to stop seepage, installation of leak-proof gates, delivery schedule modification to decrease canal spillage, and recapture of tail water²² for reuse.²³ MWD will pay the \$95 million construction cost over five years, while the remaining operation costs of \$123 million will be paid over forty years.²⁴ The water conserved will no longer be diverted from the Colorado River by IID and thus will be available for diversion upstream above Parker Dam by MWD.

17. *In re Alleged Waste and Unreasonable Use of Water by the Imperial Irrigation District*, State Water Resources Control Board Decision #1600, at 66 (1984) [hereinafter "Decision"].

18. *Salton Bay Marina, Inc. v. Imperial Irrigation Dist.*, 218 Cal. Rptr. 839, 844 (Ct. App. 1985).

19. See generally Decision, *supra* note 17.

20. *Water Conservation Agreement Between The Metropolitan Water District of Southern California and Imperial Irrigation District*, Dec. 1989 [hereinafter "Agreement"].

21. *Id.* at 3.

22. Tail water is "the water running off the 'tail' of a farm as the result of excess water being introduced at the 'head' of the system." *Imperial Irrigation Dist. v. State Water Resources Control Bd.*, 275 Cal. Rptr. 250, 265 (Ct. App. 1990), *cert. denied*, 112 S. Ct. 171 (1991).

23. For a more detailed description of the program, see *Conservation Program Will Divert Flow Saved*, 224 ENGINEERING NEWS-RECORD, Jan. 25, 1990, at 4, 13.

24. Charisse Jones, *MWD Turns on Money Spigot to Start Imperial Water Project*, L.A. TIMES, Jan. 10, 1990, at B4.

This agreement, touted as a "milestone"²⁵ and as "historic,"²⁶ leaves several questions unanswered. The most important question concerns the scope of IID's right to the conserved water. After the thirty-five year term expires, does IID have a right to the water conserved?²⁷ On a more conceptual level, what is the scope of a senior appropriator's right to water transferred to another who paid for the conservation which "generated" the transferred water?²⁸ Did the senior appropriator have a right to use that amount of water to begin with?²⁹

II.

SCOPE OF IID'S RIGHTS

To determine the scope of IID's rights to the water conserved requires an understanding of prior appropriations doctrine. A water right is a right to *use* water, not to *own* its corpus.

Western states apply the doctrine of prior appropriations.³⁰ An appropriative right, based on the taking of water for a beneficial use,³¹ has three elements. First, the appropriator must make

25. Bill Boyarsky, *MWD Breaks Stalemate in Water Purchase Deal*, L.A. TIMES, Dec. 14, 1988, at A3.

26. Robert Crabbe, *Imperial Valley, Urban Southland Near Historic Water Deal*, UPI, Dec. 8, 1988, available in LEXIS, News Library, UPSTAT File.

27. One issue, the effect of federal law on the status of the rights of IID under the seven-party agreement, given that the agreement is a result of federal apportionment, is beyond the scope of this Comment.

28. Western states' water rights are based on a prior appropriation system. An appropriator who diverts and beneficially uses water becomes entitled to use that water. The appropriator who is first in time is known as a senior appropriator. An appropriator who, later in time, diverts and beneficially uses water is known as a junior appropriator. In the event of a drought, the senior rights holder is entitled to his or her allotment before any of the stream's water may be used by junior appropriators. See generally GOLDFARB, *supra* note 15.

29. A significant, and as yet unresolved, issue is whether Imperial Irrigation District still owns the right to transfer water lost in transmission, in view of the determination made by the SWRCB [State Water Resources Control Board] and upheld by the courts that the District is engaged in unreasonable use in violation of California Constitution article X, section 2.

O'Brien, *supra* note 9, at 1173 n.41.

30. Eastern states apply the rule of riparian rights which gives a right of reasonable use to owners of land adjacent to streams. Having fewer streams required western states to develop law which allowed water rights to move away from riparian land. The prior appropriation doctrine developed during the California Gold Rush as miners diverted streams and used water in their search for precious metal. California employs elements of both riparian and prior appropriations law. This Comment addresses only the latter.

31. Gavin M. Craig, *California Water Law in Perspective*, 68 CAL. WATER CODE LXV, LXX (1971).

a "diversion" from the stream.³² Second, an appropriative right must be first in time to be secure against later (that is, junior) appropriators in the case of a shortfall of water.³³ Third, and perhaps most important, the water diverted must be put to a beneficial use.³⁴ Several factors go into the beneficial use determination, including custom, usage, and the user's financial ability to pay for water saving equipment.³⁵

A use of water meeting the beneficial use elements at a particular time can later be forfeited if the water is no longer diverted or put to beneficial use.³⁶ Another (would-be) appropriator may file a request with the state for an investigation of a senior appropriator's usage.³⁷

Did IID forfeit its right to the water it conserved under the agreement — either by initially using the water inefficiently or by proposing to stop using it itself? If so, the water "returns" to the river and is subject to claim by another appropriator.

At first blush, it appears as if California law is clear that no forfeiture occurred. In the 1980s the California legislature, in an effort to increase water use efficiency, made several changes in the law to clarify the issue of whether a conserver maintained rights to conserved water.

32. "Diversion" is a legal requirement that may not mean actual diversion; leaving water in-stream can be a beneficial use in some states. See *California Trout, Inc. v. State Water Resources Control Bd.*, 153 Cal. Rptr. 672 (Ct. App. 1979)(Reynoso, J., dissenting).

33. Norman K. Johnson & Charles T. DuMars, *A Survey of the Evolution of Western Water Law in Response to Changing Economic and Public Interest Demands*, 29 NAT. RESOURCES J. 347, 350 (1989)("In times of shortage senior rights were protected up to the available supply, while junior users, who may have had plenty of water in a 'normal year,' received no water at all."). A misuse or waste by a senior appropriator means less or no water for junior appropriators. William R. Attwater & James Markle, *Overview of California Water Rights and Water Quality Law*, 19 PAC. L.J. 957, 968 (1988).

34. CAL. WATER CODE § 1240 (West 1992)("The appropriation must be for some useful or beneficial purpose, and when the appropriator or his successor in interest ceases to use it for such a purpose the right ceases.").

35. See discussion *infra* part III.B.

36. CAL. WATER CODE § 1241 (West 1992).

When the person entitled to the use of water fails to use beneficially all or any part of the water claimed by him, for which a right of use has vested, for the purpose for which it was appropriated or adjudicated, for a period of five years, such unused water may revert to the public and shall, if reverted, be regarded as unappropriated public water. Such reversion shall occur upon a finding by the board following notice to the permittee and a public hearing if requested by the permittee.

Id.

37. In California, such a request would be handled by the State Water Resources Control Board ("SWRCB"). See, e.g., *Decision, supra* note 17, at 1, 4.

Among these changes, section 1011 of the California Water Code was amended to read:

When any person entitled to the use of water under an appropriative right fails to use all or any part of the water because of water conservation efforts, any cessation or reduction in the use of such appropriated water shall be deemed equivalent to a reasonable beneficial use of water to the extent of such cessation or reduction in use. No forfeiture of the appropriative right to the water conserved shall occur³⁸

Furthermore, section 1012 specifically addresses the IID conservation efforts. This section, added in 1984, states in pertinent part that rights to Colorado River water saved by conservation within the IID shall not be subject to "forfeiture, diminution, or impairment" resulting from reduced use.³⁹

Finally, section 109 was added in 1980 and amended in 1982 to declare that it was the state's policy to facilitate the voluntary transfer of water and water rights where consistent with the public welfare.⁴⁰

Upon close examination, however, it is not so clear that sections 1011 and 1012 are dispositive of the conserved water's status. The language of the code protects the appropriators' rights to water to which they are "entitled." The question that remains to be addressed is whether the water conserved is an entitlement of the IID. The answer appears to be no. Until recently, courts have manifested a great reluctance to divest an appropriative right on the grounds of non-beneficial use; courts have avoided in their opinions the use of the divestment triggering term "unreasonable" even when water was used in an egregiously inefficient manner. However, in affirming a decision of the SWRCB which found IID's practices to be unreasonable, the court did not shy away from calling IID's practices "unreasonable."⁴¹ This may suggest a willingness to divest non-beneficial users of their rights.

The SWRCB ruled in 1984 that IID's then-existing patterns of use were unreasonable. The Board ruled that

[a]lthough Imperial Irrigation District has taken some steps to conserve water, the evidence establishes that there are additional practical measures available to reduce the present losses of water

38. CAL. WATER CODE § 1011 (West 1992).

39. *Id.* § 1012.

40. *Id.* § 109.

41. See *infra* text accompanying notes 51-52.

within the District. Under the circumstances of this case, the Board concludes that the failure to implement additional water conservation measures at this time is unreasonable and constitutes a misuse of water under Article X, Section 2 of the California Constitution and Section 100 of the California Water Code.⁴²

The general rule in the state is that to remain vested a water right must not only be used, but must be used beneficially.⁴³

Nevertheless, the case law hints at the courts' reluctance to divest an appropriative right on the grounds of non-beneficial (mis)use. In particular, the courts have been reluctant to force parties to adopt conservation measures, as exemplified by the opinion in *Tulare Irrigation District v. Lindsay-Strathmore Irrigation District*.⁴⁴ In rejecting the argument that the senior appropriator must adopt greater conservation measures, the *Tulare* court noted that the senior's 40-45% transmission loss due to seepage was permissible considering an average regional loss in excess of 40%.⁴⁵ In *Erickson v. Queen Valley Ranch Co.*,⁴⁶ the court followed *Tulare* and held that an appropriator may not be coerced to pay for new conservation methods. Conservation measures to free up water would have to be paid for by junior appropriators. *Erickson* involved a diverter of a stream who conveyed water to his ranch via a dirt ditch from which "five-sixths of the flow" "was lost en route to the point of use."⁴⁷ Although the court mentioned that Erickson faced possible forfeiture during subsequent proceedings, it seems fair to interpret that the court actually ruled that Erickson was not divested of his rights. Two lines of analysis lead to this conclusion. First, an intent to divest an appropriative right seems impossible to reconcile with a ruling that a right holder cannot be compelled to take conservation measures. To say that a means of transmission is not a beneficial use is to say that there is a forfeiture if use continues in the

42. Decision, *supra* note 17, at 66.

43. *National Audubon Soc'y v. Superior Court*, 658 P.2d 709, 725 (Cal.), *cert. denied*, 464 U.S. 977 (1983) (interpreting California Constitution article X, section 2) ("The right to water or to the use or flow of water in or from any natural stream or water course in this State is and shall be limited to such water as shall be reasonably required for the *beneficial* use to be served . . .") (emphasis added).

44. *Tulare Irrigation Dist. v. Lindsay-Strathmore Irrigation Dist.*, 45 P.2d 972 (Cal. 1935).

45. *Id.* at 1009.

46. *Erickson v. Queen Valley Ranch Co.*, 99 Cal. Rptr. 446 (Ct. App. 1971).

47. *Id.* at 450.

same manner.⁴⁸ In effect, to say such use is unreasonable and to threaten divestiture is essentially coercive — a compulsion to take conservation measures. If the court had found that the Ericksons, as the senior right holders, were acting unreasonably, the court would also have been required to find that no water right attached to the unreasonably wasted water and that the would-be junior appropriator could take the water without impairing any protectable interest of the seniors.⁴⁹

Second, the language of *Erickson* suggests that the court sought to avoid having to declare an obviously unbeneficial use to be just that. The court uses “terms such as ‘waste’ and ‘excessive diversion’ but seems to carefully and intentionally refrain from finding that the Ericksons’ conveyance practices were . . . unreasonable.”⁵⁰

*Salton Bay Marina, Inc. v. Imperial Irrigation District*⁵¹ and *Imperial Irrigation District v. State Water Resources Control Board*⁵² suggest that courts are changing course in the “correct” — that is, economically efficient — direction. In these cases, which pressured IID into the agreement, the courts, unlike the *Erickson* court, actually called a right holder’s diversion and conveyance practices “unreasonable.” To this extent, the courts took a step toward divesting appropriative rights which were being unreasonably used. Of course, this may be a shift more in appearance than in reality; the Board and the courts may have ruled that the poor IID irrigation practices were unreasonable not because the water could be used more efficiently elsewhere, but because the lost runoff water was causing serious property damage to property owners in Imperial County.

IID’s unused water, diverted from the Colorado River, drained into the Salton Sea, causing a rise in sea level and flooding surrounding property. It was these injured property owners who

48. Of course, non-beneficial use does not divest rights immediately. Rights are divested only after a five-year period of non-beneficial use. See *supra* note 36.

49. Clifford W. Schulz & Gregory S. Weber, *Changing Judicial Attitudes Towards Property Rights in California Water Resources: From Vested Rights to Utilitarian Reallocations*, 19 PAC. L.J. 1031, 1081 (1988).

50. *Id.*

51. *Salton Bay Marina, Inc. v. Imperial Irrigation Dist.*, 218 Cal. Rptr. 839 (Ct. App. 1985).

52. *Imperial Irrigation Dist. v. State Water Resources Control Bd.*, 275 Cal. Rptr. 250 (Ct. App. 1990), *cert. denied*, 112 S. Ct. 171 (1991).

filed suit in Salton Marina. Flood damage cost "millions of dollars . . . in recent years."⁵³

Despite this, the language of the decision, holding that IID's practices were unreasonable, suggests that IID is not entitled to the water unreasonably used.⁵⁴ If this is true, then the conserved water should be treated as unappropriated and available for another user.⁵⁵ If the water conserved was previously used unreasonably, it was not an entitlement of IID to begin with, not being part of a perfected appropriative right.

Whether or a not a right to conserved water is found, the normative policy recommendation of this paper is that IID should be found divested of its right to use the wasted water under the beneficial use doctrine. The general argument of this proposal is presented in Part III, below.

III. PROPOSAL

A. *Insufficiencies of the Market Approach*

Under the current law it is not at all certain that the Board or the courts will find economically inefficient practices to be unreasonable. The thrust of this Comment's recommendation for change is that the Board and the courts should equate reasonable water use with efficient use.

Most water law reforms concentrate on the simple elimination or palliation of the legal barriers to water and water rights transfers.⁵⁶ The idea behind these reforms is that if water rights can be sold, then an appropriator faces the full cost of water used (e.g., the cost of diversion plus the social cost of the water).⁵⁷ The social cost of the water is reflected in the opportunity cost

53. Tim Skrove, *The Salton Sea, Nature's Accident in the Desert*, 52(4) *AQUEDUCT* 9, 9 (1986). Property owners began going to court against IID in the mid-1970s. *Id.* at 11.

54. This would be the case because an appropriator is not entitled to water being used unreasonably. *See supra* note 36.

55. *See supra* note 36.

56. Such barriers include districts' contractual prohibition on out-of-district sales, the no-injury rule, and related reports, etc.

57. To be sure, to signal an agricultural appropriator to use the efficient amount of water, the appropriator ought to face the true cost of water. This cost includes not only the marginal diversion and transportation costs, but should include the opportunity cost imposed by using the stream when the stream's capacity could be used to produce municipal water as well. This opportunity cost equals the price municipalities and industries would be willing to pay on the margin for the same water.

the rights holder faces when using the water. If an appropriator can sell the inefficiently used water, the appropriator has an incentive to conserve such water provided that the sale price is greater than the cost of the conservation. A "basic economic principle is that resources tend to gravitate toward their most valuable uses if voluntary exchange — a market — is permitted."⁵⁸ Unfortunately, because the water market is imperfect,⁵⁹ users do not face the full opportunity cost of their water and therefore implement a suboptimal level of conservation measures.

This free-market approach is supported by Coasean analysis. The Coase theorem⁶⁰ holds that well defined entitlement rights coupled with zero transaction costs of transfers will yield socially optimal results regardless of the initial distribution of the entitlement. For the Coase theorem to function, four assumptions must be met: Rights must be transferable, transaction costs must be zero or low, actors must seek to maximize profits, and "compensating" and "equivalent" variations must be equal.⁶¹

The market based solution — to wit, easing transfers and clarifying rights — seems unable to fully solve poor water allocation in the west. Certainly, the IID-MWD transfer seemed to be a significant demonstration of the power of the market to effect beneficial transfers. But, if there are so many barriers to water transfers, why was this agreement completed? Free marketeers would point to this as a market success. Unfortunately, it would be inaccurate to say that the agreement was easily reached, or that IID acted in a purely voluntary manner. The agreement took over five years to reach and both parties were under considerable external pressure to deal despite uncertainties and unresolved ambiguities in the law. IID was essentially forced into

58. RICHARD A. POSNER, *ECONOMIC ANALYSIS OF LAW* 9 (3d ed. 1986). "Incentives may trigger the necessary water markets by encouraging the adoption of economical water use technologies. Technology adoption would be financed by the proceeds from the sale of the saved water." TARLOCK, *supra* note 1, at 5-27.

59. See *infra* notes 61-81 and accompanying text.

60. Ronald H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1 (1960).

61. Herbert Hovenkamp, *Marginal Utility and the Coase Theorem*, 75 CORNELL L. REV. 783 (1990). Compensating variation is the amount that must be paid to an agent in exchange for one of the agent's goods. The equivalent variation is the amount the agent would pay for the same good. These two amounts are not always the same. "[P]eople seem to measure value very differently depending on whether they are 'buying in' or 'selling out.'" *Id.* at 799.

the agreement by the SWRCB, the "state government's top decision-making body for water allocation and rights."⁶²

The current reform of water law⁶³ is designed to "unfreeze" the water market, giving water users an incentive to implement conservation measures at efficient levels. But, because of imperfections in the market place, described below, the incentive is diminished. Despite increasing drought driven incentives, and "despite widespread legislative activity in this area," "there have been relatively few concrete examples of water marketing in California."⁶⁴

This can be explained in a Coasean sense because the conditions of the Coase theorem are not satisfied in the western water arena.

Failure of the Coase theorem to account for a real world outcome is simply an observation that (1) an entitlement is not freely alienable; (2) transaction costs are higher than anticipated; (3) the actors are not profit-maximizers; or (4) wealth effects undermine the invariance thesis — i.e., in a given situation one of the premisses does not obtain.⁶⁵

Each condition appears to go unsatisfied in the water "market."

1. Water is not freely alienable. Even if there were no contractual prohibitions to water transactions, water users must still face the legal requirement of the no-injury rule. A transfer of an

62. Crabbe, *supra* note 26. IID was under order of the SWRCB to conserve water. The Board specified conservation measures which "should be implemented as soon as possible." Decision, *supra* note 17, at 66.

This order resulted because the Board concluded that IID's "failure to implement additional water conservation measures . . . is unreasonable and constitutes a misuse of water under Article X, Section 2 of the California Constitution and Section 100 of the California Water Code." Decision, *supra* note 17, at 66. The Board's decision was affirmed by the California Court of Appeals in *Salton Marina*, 212 Cal. Rptr. 701 (Ct. App. 1985), and in *Imperial Irrigation District*, 275 Cal. Rptr. 250 (Ct. App. 1990). The SWRCB has "full authority to exercise adjudicatory and regulatory functions in the field of water law" and has "broad authority to control and condition water use, insuring utilization consistent with public interest." *Id.* at 255 (quoting *Imperial Irrigation Dist. v. State Water Resources Control Bd.*, 231 Cal Rptr. 283 (Ct. App. 1986)).

The fact that the Agreement was approved and has seen the first stages of implementation does not resolve the uncertainties present in current law. Whether IID would retain its water rights to the water "sold" to urban Southern California "is not an obstacle to the deal, since both parties have agreed to let the courts settle the question." Crabbe, *supra* (citing Bill Condit, IID Board Member). The parties agreed to "go forward with the Agreement . . . without regard to current or future legal differences. . . ." Agreement, *supra* note 20, at 4.

63. See *supra* text accompanying notes 38-40.

64. O'Brien, *supra* note 9, at 1167.

65. Hovenkamp, *supra* note 61.

appropriative right, or a change in use, requires that other water users not be detrimentally affected.⁶⁶ "This requirement stems from the interrelated nature of the rights to use water on any water course."⁶⁷ Supervision to prevent detrimental impact is usually by quasi-judicial board; in California the SWRCB monitors water use.⁶⁸ Thus, even if water transfers were arranged, some of them still could not proceed. It is highly unlikely that the no-injury rule could or would be modified or eliminated. The nature of a water right as a usufruct implies that all appropriators' water rights are inextricably bound with each other. To allow appropriations and transfers without regard for injury to other appropriators destroys the nature of all appropriative rights.

Even if no injury would result from a transfer, marketing possibilities are still limited because water rights lack supply certainty. "Unlike real property rights, usufructuary water rights are limited and uncertain [because the] available supply of water is largely determined by natural forces."⁶⁹

2. Transaction costs remain prohibitive. A transfer of water requires a demonstration that there is no third-party injury. Such a determination is costly. Third-party injury occurs in several ways. For example, injury might occur through a change in diversion points, a reduction in return flows, or an alteration in time or rate of diversion. Even in cases where no injury exists, the costs of demonstrating this fact can be high.

Further, water is not a homogeneous product,⁷⁰ which increases the difficulty in arranging transfers. For example, changing the point of diversion might also change the quality of water in the stream.⁷¹ Such changes must also be considered.

Assuming *arguendo* that external transaction costs — incurred through negotiations with a seller or purchaser — are zero, there are still significant transaction costs internal to water agencies because an agency or district is composed of many individuals who may have different interests. Groups often have difficulty arriving at a consensus. For example, one cause of the protracted

66. CAL. WATER CODE § 1702 (West 1971).

67. Johnson & DuMars, *supra* note 33, at 372.

68. *Id.* at 379.

69. United States v. State Water Resources Control Bd., 227 Cal. Rptr. 161, 170 (Ct. App. 1986).

70. See *infra* text accompanying note 90.

71. See *infra* note 91 and accompanying text.

IID-MWD negotiations was a storm of protest from the public of Imperial County over the agreed price.⁷²

It might be argued that refining the beneficial use standard so as to require that water be used in an economically efficient manner puts all the burden of demonstrating the absence of third-party injury on a junior appropriator who seeks to appropriate water left in-stream by a senior conserving appropriator. This imposition however, is no different than the current burden on any appropriator. If there is no third-party injury, the junior appropriator will be permitted to divert.

If there is a third-party injury from the subsequent diversion and use, however, it may appear that there is no need to have required the senior appropriator to take the conservation measures because the junior appropriator will not be allowed to divert the water. This is not a decisive attack on the proposal for three reasons.

First, water has in-stream value. Protecting in-stream uses is beneficial but would not necessarily result from a market system, because in-stream flows are public goods. That is, because the value of in-stream water is beneficial to all members of society, the benefits are diffuse. At the same time, under a market system the costs of purchasing conserved water from an appropriator to keep in-stream are potentially great. Because each citizen faces a diffuse benefit but a great cost to purchase water to maintain in-stream flow, it is unlikely that anyone would make such a purchase. Certainly, governments are formed to purchase and provide public goods. Adoption of the proposed beneficial use standard by the government would be analogous.

Second, the proposal would still result in an otherwise unattainable goal. By requiring a user to conserve at efficient levels it is likely that the uses to which the water is put would become more efficient. If the user is required to face the opportunity cost of water (including the diversion cost and the social/opportunity cost) — which includes efficient levels of conservation — then the user will feel economic pressure to put water to efficient end uses.⁷³

72. Crabbe, *supra* note 26.

73. To be sure, there are two types of conservation: conservation "attributable to conservation programs" and conservation "realized from consumer's response to rising water rates." *Forecasting Water Conservation Savings*, WATER CONSERVATION NEWS, Sept. 1987, at 2, 2.

Third, although wasteful diversions often return to the stream as "return flow" and are readily available for other appropriators, the initial diversion out of the stream increases pollutant and saline content of the stream because the water leeches the soil and carries with it the salts and pesticides it picks up during its diversion. "These excessive return flows increase water salinity and add sediment to streams, causing poor water quality and economic harm to downstream users."⁷⁴

3. The third condition of the Coase theorem also is not met. Water appropriators are not necessarily profit maximizers. First, many irrigation district members seem to believe that water is not a transferable asset or a commodity with which to make a profit, but rather a natural good fundamental to an agricultural community.⁷⁵ Second, there is a suboptimal quantity of conservation/sales measures because water conservation and sales often require collective action. In the circumstances of water, the logic of collective action suggests a natural opposition to a sale because although each member of a water district may be a profit maximizer, it does not follow that the district as a collective is geared toward profit maximization. Profits of a water district are, like in-stream waters, a public good, albeit with a smaller public. An individual district member seeking to effect the collective good of transferring water would face a disproportionate share of the cost relative to the benefit and opt to do nothing. In the absence of an external force to coalesce individuals, "the customary view that groups of individuals with common interests tend to further those common interests appears to have little if any merit."⁷⁶

4. In the water market there is a problem of "compensating and equivalent variations."⁷⁷ That is to say, agricultural appropriators do not necessarily value the market price as much as their water entitlement (for example, the appropriator may value having an entitled right to water use more than the market would

74. Mark W. Tader, *Reallocating Western Water: Beneficial Use, Property, and Politics*, 1986 U. ILL. L. REV. 277, 290 (citations omitted).

75. Hovenkamp, *supra* note 61, at 788. For example, during the negotiations of the IID-MWD Agreement, a "group of dissident farmers" had raised fears about "the potential loss of control over their supplies to the giant urban water agency." *Murky Water Issue Needs Clearing*, L.A. TIMES, Oct. 31, 1989, at B6. "Old enmities were invoked, with many in the Imperial Valley recalling how the city of Los Angeles forced Owens Valley ranchers to give up their water many years ago." Boyarsky, *supra* note 25, at A-3.

76. MANCUR OLSON, *LOGIC OF COLLECTIVE ACTION 2* (1971).

77. See generally Hovenkamp, *supra* note 61.

pay, even if the market price is greater than the appropriator's cost). For example, if Luck E. Day, a tennis fan, were to find on the ground a ticket to attend Wimbledon, it is likely he would sell the ticket only at a high price, say \$1000. But, if Luck had no ticket, it is unlikely he would part with \$1000 to purchase one. That is to say, the consumer's "take away" price of an entitlement is generally higher than the price he or she is willing to pay for the same entitlement; the price at which trades would occur would happen above market (read efficient) levels.

Market failure due to the variance problem is compounded because agricultural communities often have a non-market attachment to their water.⁷⁸ It is perceived as special; therefore, there would be a tendency to conserve and sell less than efficiency would dictate. That agricultural users have a special attachment to water is certainly understandable because water is vital to agricultural life. Certainly, there are social ("non-economic"⁷⁹) reasons why individuals act collectively⁸⁰ — but such social pressures of a farming community seem to cut against conservation and sale of water. Empirically, it should be noted that the IID board member initially proposing and negotiating the transfer agreement with MWD was ousted from office in general elections by the protesting district members.⁸¹

B. *Refine Definition of Beneficial Use*

A refinement of the definition of beneficial use would achieve greater levels of water use efficiency than would a pure market approach. A key element of this refinement is to eliminate the use of customary water usage as a factor considered when evaluating a right holder's use. It has been "long established" in California that "custom and usage are relevant to a reasonableness inquiry."⁸²

78. See *supra* note 75.

79. OLSON, *supra* note 76, at 60.

80. *Id.* at 61.

81. Crabbe, *supra* note 26.

82. Schulz & Weber, *supra* note 49, at 1081. However, custom is no longer solely determinative. CAL. WATER CODE § 100.5 (West 1992) ("It is hereby declared to be the established policy of this state that conformity of a use, method of use, or method of diversion of water with local custom shall not be solely determinative of reasonableness, but shall be considered as one factor to be weighed in the determination of reasonableness of use, method of use, or method of diversion of water, within the meaning of Section 2 of Article X of the California Constitution.").

Custom is a poor standard. Because an appropriative right has a "use it or lose it" nature — resulting from the first in time element — users historically have had little incentive to use water more efficiently, despite spiraling costs of developing new sources. Appropriators faced simply the incentive to use as much water as possible for a beneficial end and paid scant attention to the method of conveyance⁸³ and method of use because they feared that water not appropriated then would not be available for their appropriation later. Consequently, customary usages have historically and traditionally been less than efficient. Certainly, the courts have come to recognize the shortcomings of custom as a standard in the field of torts.⁸³ And, while custom may have some probative value in torts claims, it is far less indicative of efficiency in the water arena. In torts, there are generally many actors engaged in the measured conduct. In water law, however, the custom of the locality has often been established by the very user whose practice is being measured. Often, the right to the entire locality's water supply was held by one appropriator — the locality's water district or mutual water company.⁸⁴

Courts and the SWRCB should equate beneficial method of use with "economic efficiency." Efficiency obtains when "resources are being used where their value is highest."⁸⁵ If resources are measured by dollars, then water is being used efficiently if for the next acre-foot generated at a given location, it could not be generated and transmitted to the same location at

Nevertheless, Tader observes that "[a]lmost inevitably, courts define waste in terms of deviating from customary local irrigation practice." Tader, *supra* note 74, at 282.

83. See generally *The T.J. Hooper*, 60 F.2d 737, 740 (2d Cir.)(L. Hand, J.), *cert. denied*, 287 U.S. 662 (1932).

84. In the substantive area of tort law, "[t]he actor's own record of past conduct, which is commonly called 'habit' rather than custom, is no evidence of any standard of reasonable care." W. PAGE KEETON ET AL., *PROSSER AND KEETON ON THE LAW OF TORTS* § 33, at 195 (5th ed. 1984). For example, custom in Imperial County has in large part been set by the IID whose delivery system of canals is 50 years old. Ronald B. Taylor, *MWD Swings an Unusual Deal for Imperial Water*, L.A. TIMES, Nov. 10, 1988, at B3.

85. POSNER, *supra* note 58, at 9.

This is to say that a process is productively efficient if it yields a given level of output with the least cost combination of inputs. That is, the firm cannot produce the given level of output at lower cost. Equivalently, a process is productively efficient if it maximizes the level of output attainable from a given combination of inputs.

COOTER & ULEN, *supra* note 12, at 17.

the same season for fewer dollars.⁸⁶ There is a continuum of conservation measures which exhibit an increasing marginal cost curve for a given region. For example, a user can line canals with impermeable material, cover canals, reuse tail water, employ drip irrigation equipment instead of flooding fields, use pumps instead of gravity flow, laser level fields, desalinate brackish and sea water, and even tow icebergs from the Antarctic.⁸⁷ The question is at what point in the middle of the extremes should the SWRCB and the courts draw the line on an appropriator's use?

To determine the efficient conservation level for an appropriate rights holder the Board should recognize the economic rule that an efficient amount of production occurs when the marginal cost of production equals the marginal benefit. It is a fair presumption that conservation measures exhibit decreasing marginal returns. A user can select from a menu of conservation methods. Each measure results in a net savings of water. But, saving the first acre-foot of water would be cheapest and each subsequent acre-foot saved would cost more.

The efficient point to stop implementing increasingly expensive conservation measures is where the cost equals the benefit. The "proper" amount of water "generating" conservation options, given the universe of available technology, is at the point where the cost of the last measure taken (marginal cost of conserved water) is equal to the marginal benefit of the water thereby conserved. Beyond that point, the extra water saved (marginal benefit) is not worth the cost of the extra savings measures (marginal cost) used to save that water.

In calculating the marginal benefit, standard microeconomic analysis suggests that the marginal benefit of a good (*e.g.*, the benefit accruing to the producer from manufacturing one more widget or one more acre-foot of water) is equal to the price for

86. Of course, economic efficiency is to be distinguished from the best scientific method. The desired amount of conservation is not necessarily what is technically possible. Rather, the desired amount of conservation is at the intersection of what is scientifically possible with economically efficient possibilities. It is possible to carry water in hermetically sealed casings and grow crops in water-tight vessels but this would be silly in all but the driest and most desolate areas, where the price of water warrants such measures. Conversely, it would be equally as silly in all but the most water abundant locales to carry water through a dirt ditch which permits five-sixths of the water to seep away.

87. For a description of some of these methods, see *Want to Start a Brawl in a Rural Bar?*, 51(2) *AQUEDUCT* 14, 14 (1985).

which the producer could sell that good.⁸⁸ That is to say, the marginal benefit of a conservation measure is equal to the amount of water (a-f) thereby conserved multiplied by the price per acre-foot (\$/a-f). Ordinarily, marginal benefit is determined by reference to market price, but water does not flow between users within a perfect market.⁸⁹ Deriving a method of determining the price of water — so as to calculate the marginal benefit — requires a brief understanding of water as an economic good.

Water is not homogeneous — it is differentiated over time (season), space (location) and content (quality).⁹⁰ A given quantity of water may be more valuable in a drought than in a wet year. Analogously, the same water may be more valuable in August than in February. By the same token, water in Northern California is a different product from its southern counterpart. It should be noted that water is not transported with facility, but that a means of transportation must exist if a transfer is to take place. Certainly, water can be transported great distances but only at correspondingly great costs. This is why the price of water in a desert will be higher than the price of water in a rain forest. Finally, water at the same place and time may vary by its content impurities. For example, water above the California Delta is different from water downstream, closer to the ocean, because of different saline and pollutant content.⁹¹ The existence of these differentiating factors creates several markets for different goods collectively known as “water.”

Because there are different markets for water, each with its own price, consideration must be given to the appropriate market when price is determined. To limit the geographical location, it seems logical to set boundaries on the stream system of the

88. If the market entails a monopoly or oligopoly then the optimal production quantity, from the viewpoint of the producer, is where marginal cost equals marginal revenue; but, that marginal revenue in an oligopoly is less than society's marginal benefit from additional output. That certain regions may be subject to monopolistic or oligopolistic water sellers does not alter the validity of the proposal because the “price” is set where marginal cost equals *societal* marginal benefit.

89. See discussion *supra* part III.A.

90. See generally, HIRSHLEIFER, *supra* note 11, at 33.

91. See *United States v. State Water Resources Control Bd.*, 227 Cal. Rptr. 161, 172 (Ct. App. 1986).

Salt water entering from San Francisco Bay extends well into the Delta, and intrusion of the saline tidal waters is checked only by the natural barrier formed by fresh water flowing out from the Delta By storing waters during periods of heavy flow and releasing water during times of low flow, the freshwater barrier could be maintained at a constant level.

Id.

appropriator under consideration. Within the stream system, water is easily transported through the stream in which it flows. And, given dams to provide an "inventory" of water for that geographic locale, the temporal nature of water differentiation is not problematic.⁹² The SWRCB would therefore equate marginal benefit of the conservation measure with the price in that stream system of the type of water with the same content as the water conserved.

How then does the Board determine price? The logic of microeconomics reveals that in a perfectly competitive market, price is going to be driven downward until it equals the marginal cost of production. Because the goal of the proposal is to get water to where a free market would cause it to flow — to mimic the market — it would be wise to set price (marginal benefit) equal to the marginal cost of water in the given stream system. Marginal cost, by definition, is equal to the cost of the next best (cheapest) alternative of producing, generating and collecting, and distributing new water to users in the system. There are generally several, if not many, alternatives to consider. The most prominent are new collection dams, the purchase of foreign water (from outside of the stream system), desalination of brackish or sea water, and generally now the cheapest is conservation — using less water through new technology for the same purposes (*e.g.*, lining canals, covering canals, collecting and reusing tail water, using watertight canal gates and valves, laser-leveling fields, using drip irrigation systems, etc.).⁹³

92. Quality of water must also be considered. Within a stream system, if pure water is unavailable, the price of pure water would be determined by the price of impure water plus the cost of the requisite level of purification/desalination. Of course, the geographical market may expand beyond the stream system given long range transportation from one watershed to another. The cost of transporting "foreign" water is simply one factor of the price.

93. Marginal cost is normally the cost of increasing capacity. But the water industry, — because of the uncertainty of precipitation — must generally have an excess capacity. In a "normal" industry where inputs can be purchased — as opposed to the water industry where inputs must fall from the sky — marginal cost is zero where existing capacity is not fully taxed. That is because extra space behind a dam constitutes excess capacity to divert the water to where it must be used; thus, it does not cost any extra resources (excluding pumping and other maintenance costs) to supply an increased demand.

However, in the water industry, where input (precipitation) is unpredictable and varies greatly from year to year, there must always be an excess industry capacity to supply demand in dry seasons and dry years. There must be a buffer of excess generation and storage capacity at all times. Unlike other goods, water has temporal differentiation, which means water must be stored for use when rainfall and snow runoff dip below average in a certain year. To this extent, there must generally

As a general rule, if marginal costs of conserved water are less than the price of water in the area, the appropriator would be required to take such measures to maintain the right. As a consequence, water will be conserved. Conserved water "goes back to the river" and becomes available for appropriation by others. An appropriator who takes conservation measures beyond minimum "efficient" levels preserves the right to conserved water and may sell or lease it as provided for by California law. This rule would be applied by the Board in California or by analogous agencies in other states.⁹⁴

Opponents of the proposed modification of the law — the senior appropriators — would argue that it is bad to make the senior pay for benefits of junior appropriators. This claim, however, is turning the analysis on its head. Paying for the conservation measures simply means that the right holder is paying the proper price for appropriated water. The price is accurate — the marginal cost of water. The water could be sold, kept, or leased (subject to no-injury rule, of course).

It is true that some current appropriators will be unable to afford the requisite conservation equipment and when held to the efficiency standard may be forced to exit the market. It may be a political good to avoid throwing farmers out of work and to keep from shutting down agricultural communities. But the plight of the farmers should not blind the Board, the courts, and the legislature to the need for water conservation. The best solution to farm unemployment would be direct welfare assistance, not hidden subsidies within water pricing policy. One incarnation of the direct subsidy has already been in effect for several years: subsidized loans for the lining of canals.⁹⁵

The general scope of the proposal applies only to method of use. The proposed legal reform does not restrict beneficial use to

always be excess capacity. This means that marginal cost is positive even though there may exist excess capacity at any particular time. Therefore, water price should be set at marginal cost of increased capacity of supply of water beyond the then existing levels and existing potential levels.

94. An alternative proposal, enacted in Oregon, OR. REV. STAT. § 537.460 (1987), is worth full consideration but is outside the scope of this Comment. The Oregon law allows a party to keep approximately 75% of conserved water, while the State reserves the remaining 25%. See generally D. Craig Bell & Norman K. Johnson, *State Water Laws and Federal Water Uses: The History of Conflict, the Prospects for Accommodation*, 21 ENVTL. L. 1, 19-20 (1991).

95. See Donald C. Heath, *Low Interest Loans Available*, WATER CONSERVATION NEWS, Sept. 1985, at 1, 1 (low interest loans for capital outlay water conservation programs available to water users from the State Department of Water Resources).

certain types of end products (such as, agricultural or domestic uses).⁹⁶

CONCLUSION

Market principles have proven unable to yield significantly better water allocations in the water-starved west. Certainly, the transfer between IID and MWD did not occur until administrative and judicial proceedings threatened IID. To the extent that greater water efficiency is desired, increased government intervention in the form of a stricter definition of beneficial use is likely to be necessary. An economic efficiency standard, imposed by the SWRCB under its authorization to determine beneficial use, would increase water's productivity and free agricultural water for more valuable uses.

96. Certainly, this examination of the scope of the right to conserved water and subsequent proposed legal reform is warranted not only because there is great concern about water shortages but because conservation of water is a productive way of increasing usable water supplies. TARLOCK, *supra* note 1, at 5-26. Farmers can maintain crop levels with much less water. "You can shift 10 percent of water out of agriculture and create a lot of water." Newdorf, *supra* note 10 (quoting John Krautkraemer, senior attorney at the Environmental Defense Fund).

"Irrigation currently accounts for eighty-two percent of all water diversions in the West. Moreover, with irrigation water use efficiency averaging only forty-one to forty-six percent, agricultural users lose approximately 23.6 million acre-feet of water annually." Tader, *supra* note 74, at 290 (citations omitted). "Irrigation efficiency" is the ratio of water a crop requires at irrigation to what is actually applied. See *Profits Available in Water Conservation, According to Imperial Irrigation District*, WATER CONSERVATION NEWS, Mar. 1987, at 5, 5. For an example of an agricultural water savings program, see *Proof That Conservation Works*, WATER CONSERVATION NEWS, Mar. 1987, at 4. (El Dorado Irrigation District first to supply documented proof that agricultural water conservation works, providing water for \$25/a-f compared to \$100/a-f for new developed water).