

University of Colorado Law School

Colorado Law Scholarly Commons

Books, Reports, and Studies

Getches-Wilkinson Center for Natural
Resources, Energy, and the Environment

1985

Guidelines for Developing Area-of-Origin Compensation: A Research Report Prepared for the Colorado Water Resources Research Institute

Lawrence J. MacDonnell

Charles W. Howe

James N. Corbridge, Jr.

W. Ashley Ahrens

Colorado Water Resources Research Institute

See next page for additional authors

Follow this and additional works at: https://scholar.law.colorado.edu/books_reports_studies



Part of the [Water Law Commons](#), and the [Water Resource Management Commons](#)

Citation Information

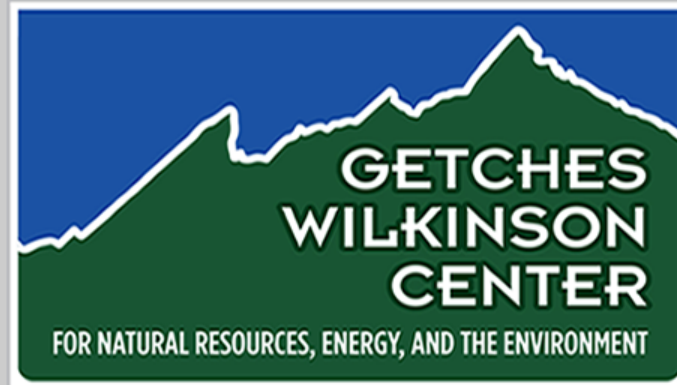
Lawrence J. MacDonnell, Charles W. Howe, James N. Corbridge, Jr. & W. Ashley Ahrens, Guidelines for Developing Area-of-Origin Compensation: A Research Report Prepared for the Colorado Water Resources Research Institute (Natural Res. Law Ctr., Univ. of Colo. Sch. of Law 1985).

Authors

Lawrence J. MacDonnell; Charles W. Howe; James N. Corbridge, Jr.; W. Ashley Ahrens; Colorado Water Resources Research Institute; and University of Colorado Boulder. Natural Resources Law Center



William A. Wise Law Library
COLORADO **LAW**
UNIVERSITY OF COLORADO **BOULDER**



Getches-Wilkinson Center Collection

LAWRENCE J. MACDONNELL, CHARLES W. HOWE, JAMES N. CORBRIDGE, JR. & W. ASHLEY AHRENS, GUIDELINES FOR DEVELOPING AREA-OF-ORIGIN COMPENSATION: A RESEARCH REPORT PREPARED FOR THE COLORADO WATER RESOURCES RESEARCH INSTITUTE (Natural Res. Law Ctr., Univ. of Colo. Sch. of Law 1985).

Reproduced with permission of the Getches-Wilkinson Center for Natural Resources, Energy, and the Environment (formerly the Natural Resources Law Center) at the University of Colorado Law School.

**GUIDELINES FOR DEVELOPING
AREA-OF-ORIGIN COMPENSATION**

**A Research Report Prepared for the
Colorado Water Resources Research Institute**

**by
Lawrence J. MacDonnell, Charles W. Howe,
James N. Corbridge, Jr., and
W. Ashley Ahrens**

**University of Colorado
December 1985**

Acknowledgement

The authors would like to thank the following persons for very helpful comments: Emery N. Castle, Resources for the Future, Inc.; K. William Easter, University of Minnesota; Norman A. Evans, Colorado Water Resources Research Institute; J.E. Flack, University of Colorado; Daniel Luecke, Environmental Defense Fund; and W.H. Miller, Denver Board of Water Commissioners.

Valuable research assistance was provided by Steve Miller, a third year law student at the University of Colorado.

TABLE OF CONTENTS

- I. Introduction
- II. General Legal Context--Prior Appropriation System
- III. The Area of Origin Concept
- IV. Types of Protection
 - A. Prohibition or Severe Restriction
 - 1. Riparian Law
 - 2. The Nebraska Experience
 - 3. Arizona
 - 4. Montana
 - B. Allocation
 - 1. Recapture of Permanent Priority
 - 2. Reservation
 - 3. Evaluation
 - C. Compensation
- V. The Colorado Approach
 - A. General Colorado Doctrine
 - B. The Conservancy District Exception
 - 1. Historical Setting
 - 2. The Law
 - 3. Judicial Interpretation
 - 4. Other Experience with Compensatory Storage
 - C. An Evaluation of the Colorado Approach
- VI. Economic Analysis of Area-of-Origin Compensation (Protection) Schemes
 - A. Why Compensate Areas of Origin?
 - B. Economically Efficient Transbasin Diversions
 - 1. Least-Cost Source of Water Supply
 - 2. Benefits Must Exceed Costs
 - C. Appropriate Forms of Compensation
 - D. General Economic Guidelines for Compensation
- VII. Conclusion

I. INTRODUCTION

In the arid West, population concentrations often are located in areas with limited surface water supplies. It has long been the practice to supplement local supplies by bringing in water from other locations. In many cases, these transfers involve moving water substantial distances--often between separate drainages and even between separate river basins. The receiving area benefits from the additional water that becomes available. However, concerns about the loss of this water to the area from which it is taken (the area of origin) have led many western states to enact some form of statutory protection or limitation.¹

This report considers the approaches that have been taken to accommodate the interests of the area of origin. It begins with a brief discussion of the general legal context established by the prior appropriation doctrine. It turns next to a consideration of the conceptual basis underlying area of origin protection. Then it discusses the types of protection that exist in the law, with special attention to the approach found in Colorado. Then it offers an economic framework within which to evaluate

¹For earlier discussions, see National Water Commission, Water Policies for the Future, 323-324 (1973) [hereinafter National Water Commission Report]; R. Kletzing & R. Robie, Area of Origin Statutes--The California Experience, 15 Idaho L. Rev. 419 (1979). G. Weatherford, Legal Aspects of Interregional Water Diversion, 15 UCLA L. Rev. 1299, 1313-1317 (1968); R. Johnson, National Water Commission, Major Interbasin Transfers--Legal Aspects (Legal Study No. 7, National Water Commission) 67-86 (preliminary draft July 26, 1971) [hereinafter Legal Study No. 7].

such legal approaches.

II. GENERAL LEGAL CONTEXT--PRIOR APPROPRIATION SYSTEM

The prior appropriation system, prevalent in the western United States, evolved from the customs of the mid-nineteenth century mining communities, and subsequently was adopted by courts and legislatures. The appropriation doctrine operates on the principle of "first in time, first in right." In contrast with the riparian system of water allocation found in the relatively humid East, the appropriation doctrine involves no watershed or land-ownership limitations on the use of the water. As was established in the early Colorado case of Coffin v. Left Hand Ditch Company,² water can be removed from the stream and diverted from the watershed of origin for use elsewhere, even though none of that water returns to the original stream system. Out-of-watershed transfers are thus recognized as proper, so long as the water is put to a beneficial use. Future uses are not protected--application to a beneficial use is the central feature of a final appropriative right. Because an existing beneficial use is crucial to the obtaining of a priority, those who have no beneficial use requirement at the present time are necessarily placed in a position of lower priority compared with those who have made an actual appropriation.

Given this basic principle, it is clear that protection of an exporting area, county, or watershed is not characteristic of

²6 Colo. 443 (1882).

the appropriation system. Any efforts to protect areas of origin are therefore in derogation of underlying appropriation principles.

III. THE AREA OF ORIGIN CONCEPT

In spite of the fundamental policy embodied in the appropriation doctrine favoring movement of scarce water resources to beneficially usable locations, many states following this doctrine have enacted some form of statutory restrictions or limitations on interbasin transfers. Searching for an explanation for such statutory provisions, the National Water Commission report pointed to inadequacies in the market for allocating water.³ The Commission commented that areas of origin for natural resources other than water do not receive such treatment,

³In its final report, the Commission stated:

Area-of-origin protection is peculiarly associated with water. Other resources are not similarly treated, probably because they are priced in conventional markets. For coal, oil, copper, timber, and other natural resources, the area of origin receives its "protection" in the form of taxes and revenues from the "export" of the resource. In the absence of a pricing system for the export of water, area-of-origin interests have resorted to the political process to obtain "in kind" protection, that is, enactment of laws reserving water for the area's "ultimate requirements" or providing for recapture in the event of future need. As a consequence of this approach, safeguards for a water exporting area have usually been tied to future or potential water development in the area.

National Water Commission Report, supra note 1 at 323.

although severance taxes are in fact based on the notion of allocating a share of the wealth distributed by nature in the form of mineral deposits or timber stands to those who happen to live in the adjoining area.⁴ It is true that water may be appropriated without payment of a market-established price but the same is true for hard rock minerals on the public lands.

An often-cited illustration of the need for area-of-origin protection for water resources is the Owens Valley in California.⁵ To supply its burgeoning water requirements in the early part of this century, the City of Los Angeles bought up much of the agricultural land and accompanying water rights in the Owens Valley east of the Sierra Nevada Mountains. A major aqueduct was constructed to transport this water to Los Angeles. The effect was to virtually eliminate what had been a thriving agricultural economy. Though Los Angeles paid for the water rights and much of the agricultural land, it did not have to provide any compensation for the other costs associated with the loss of this economy.

In Colorado, a recent presentation by a West Slope county commissioner reflects many of the concerns that charge this issue:

⁴Another interesting parallel can be found in the statutes passed in the 1970's to provide special protection to local areas impacted by the rapid growth accompanying energy and mineral development. See, e.g. MacDonnell, "Regulating Socioeconomic Impacts: Comparing the Colorado and Wyoming Approaches," 20 Land & Water L. Rev. 193 (1985).

⁵A full account is provided in R. Nadeau, The Water Seekers (1950) and E. Cooper, Aqueduct Empire (1968).

The fact of the matter is, that when water is diverted to the Eastern Slope, it is lost forever to Western Colorado counties. Without some form of substantial mitigation, the only consequences are negative ones from the Western Slope perspective.

But when water goes down the Western Slope--even if it's [sic] ultimate destination is California--the benefits, both present and potential, are considerable indeed: esthetically, there are the simple pleasures of babbling brook [sic]; recreationally, the water support [sic] fisheries, wildlife, vegetation, boating, camping, snowmaking, and other activities. Growth-wise, so long as there is water in the streambed, the possibility exists for future storage--whether for municipal, industrial, recreational, or energy use. All things appear possible to Western Coloradoans while water remains in the streambed, but when it is removed across the peaks, the options dwindle rapidly.⁶

Perspectives on area of origin protection can shift rapidly depending on the area being considered. In Colorado, some of those who oppose area of origin protection for the West Slope are strongly in favor of protecting Colorado's share of Colorado River water as against lower basin states. What is an area of origin, and, under what circumstances should such areas receive special consideration when transbasin diversions of waters from such areas are undertaken? As we will discuss below, the approaches that have been taken vary enormously--perhaps reflecting the wide variation in political interests within these states.

We believe that there are legitimate interests that should

⁶David Mott, "The West Side Story," Presentation at 10th Annual Water Workshop, Gunnison, Colorado, Aug. 1, 1985.

be accounted for in interbasin transfers which are not sufficiently recognized under the traditional appropriation doctrine. In a very real sense there is no such thing as "surplus" water.⁷ A watershed is permanently changed when its natural flow is diverted and removed. The full costs associated with this change must be accounted for and included in the cost of the diversion. In the absence of a market that gives the appropriate price signals, statutorily created mechanisms are needed. We turn next to a review of the various approaches that have been taken.

IV. TYPES OF PROTECTION

Area of origin protection methods can be divided into three general categories: prohibition or severe restriction; allocation; and compensation. It is important to note that the approaches taken often involve some mixture of methods from among these categories.

A. Prohibition or Severe Restriction

The most extreme form of protection is, of course, to prohibit such transfers. Examples may be found in most jurisdictions following the riparian doctrine and in the former law of Nebraska. Examples of major restrictions are provided under the current law in Arizona and Montana.

1. Riparian Law. Riparian water law itself has a built-in

⁷Nevertheless, see the Oklahoma definition cited in text accompanying note 30 infra.

protection for the watershed, inasmuch as use of water is generally limited to (a) riparian land, by which is meant land alongside the watercourse, and (b) use in the watershed of origin.⁸ Furthermore, in contrast to the appropriation doctrine, riparian law does not require water to be put to a beneficial use in order to establish the water right. In general, the riparian maintains an inchoate right to enjoy the benefits of water flowing past his land. Thus if a city such as New York desires to obtain nonriparian water it must utilize its power of eminent domain and pay for the property value taken.⁹

2. The Nebraska Experience. In 1889 the Nebraska legislature enacted the following provision: "The water appropriated from a river or stream shall not be turned or permitted to run into the waters or channel of any other river or stream than that from which it is taken or appropriated."¹⁰ An amendment in 1893 added: "Unless such stream exceeds in width one hundred feet, in which event not more than seventy-five percent of the regular flow shall be taken."¹¹ In 1895 the Nebraska legislature enacted some major changes in its water law which included the following provision:

⁸C. Davis, H. Coblenz, O. Titelbaum, Waters & Water Rights §614.1 (E. Clark ed. 1976).

⁹In the case of New York City, there is an additional statutory requirement which is discussed below under compensation. See text accompanying note 48 infra.

¹⁰Neb. Laws 1889, Ch. 68, §6, at 504.

¹¹Neb. Laws 1893, Ch. 40, §3, at 378. (Neb. Rev. Stat. §46-206 (1984)).

The owner or owners of any irrigation ditch or canal shall carefully maintain the embankments thereof so as to prevent waste therefrom, and shall return the unused water from such ditch or canal with as little waste thereof as possible to the stream from which such water was taken or to the Missouri River.¹²

In the case of Osterman v. Central Neb. Public Power v. Irr. Dist.¹³ the Nebraska Supreme Court interpreted these statutes as effectively barring all transbasin diversions. A subsequent court decision overruled Osterman¹⁴, and in 1981, the Nebraska legislature passed new legislation permitting interbasin transfers that pass a public interest review.¹⁵

3. Arizona. Under Arizona law, out-of-watershed transfers are severely restricted because irrigation districts, agricultural improvement districts, or water users associations located within and using water from the drainage are given a veto right regarding all water transfers.¹⁶ The provision states:

No right to the use of water on or from any watershed or drainage area which supplies or contributes water for the irrigation of lands within an irrigation district, agricultural improvement district or water users association shall be severed or transferred without the consent of the governing body of

¹²1895 Neb. Laws ch. 69, §46-265 (1984).

¹³131 Neb. 356, 268 N.W. 334 (1936).

¹⁴Little Blue Natural Resource District v. Lower Platte North Natural District, 206 Neb. 535, 294 N.W.2d 598 (1980).

¹⁵Neb. Laws 1981, LB 252, §6, Neb. Rev. Stat. §46-289 (1984). This statute is discussed infra in text accompanying note 36.

¹⁶Ariz. Rev. Stat. Ann. §45-172(5).

such irrigation district, agricultural improvement district or water users association.¹⁷

Though directed at transfers generally and not just out of watershed diversions, the restrictive effect is apparent. There are no reported Arizona cases involving this law.

4. Montana. In the 1985 legislative session, Montana enacted some major changes in its water laws. Of relevance here is a provision that enables only the Montana Department of Natural Resources and Conservation to engage in out-of-basin transfers.¹⁸ Presumably, those desiring such out-of-basin transfers must first convince the state to make the necessary appropriations, then obtain a lease from the state to use the water, and then build the facilities necessary to move the water.¹⁹ A separate provision establishes a means for reserving waters "for existing or future beneficial uses or to maintain a minimum flow, level, or quality of water...."²⁰

B. Allocation

Perhaps the most common method of providing protection is through provisions that directly or indirectly allocate some

¹⁷Id.

¹⁸HB680, §3 (1985), to be codified at Mont. Code Ann. §85-2-301(2)(i). The basins are specifically named in the law and include all the major Montana river systems.

¹⁹No more than 50,000 acre-feet may be leased. Lease terms may not exceed 50 years. HB680, §13 (1985).

²⁰HB680, §15 (1985).

portion of the water to be available for future use in the area of origin. The approaches taken here include recapture, reservation, and evaluation.

1. Recapture or Permanent Priority. California statutes enacted in 1931 and 1933 attempt to provide protection to the area of origin by making certain state-held water rights subject to future requirements of these areas.²¹ The 1931 Act has been characterized as providing a "right of recapture against the users of export water, conditioning all export water rights by giving users in the county of origin a right to recapture exported water any time the water becomes necessary for the development of the county."²² The 1933 Act, which relates specifically to the Central Valley Project, also creates an inchoate priority to obtain water whenever needed by inhabitants of the area of origin that would supercede the priorities of

²¹The 1931 provision states: "No priority under this part shall be released nor assignment made of any application that will... deprive the county in which the water covered by the application originates of any such water necessary for the development of the county." Ch. 720, §1 [1931] Cal. Stat. 1514, codified in Cal. Water Code §10505 (West, 1971 & Supp. 1985). The 1933 statute states: "In the construction and operation by the department of any project under the provisions of this part a watershed or area wherein water originates, or an area immediately adjacent thereto which can conveniently be supplied with water therefrom, shall not be deprived by the department directly or indirectly of the prior right to all of the water reasonably required to adequately supply the beneficial needs of the watershed, area, or any of the inhabitants or property owners therein." Ch. 1042, §11 [1933] Cal. Stat. 2643, codified in Cal. Water Code §11460 (West 1971 & Supp. 1985).

²²Legal Study No. 7, supra note 1, at 77 (emphasis in original).

existing exporters.²³

Giving an area of origin the authority to override existing water rights of exporters inserts an unnecessary element of instability in the system. The conditions under which such priorities could be claimed are unclear. Large water projects require reasonable certainty regarding such things as project life to assure financing. Moreover, when areas become dependent on the imported water, they are likely to resist giving up this water. Such an approach tends to generate unnecessary uncertainty and potential conflict.

2. Reservation. A second allocation approach involves reserving some share of the water for use only in that area or, conversely, allowing exportation only of so-called surplus water. The most formal method of reservation involves specific assignment of waters to an area of origin. For example, California has used its authority to condition assignment of state-held water rights under Water Code section 10505 to specifically reserve a portion of the water for the county of origin.²⁴ A New Mexico statute recognizes a "natural right" to a

²³See, e.g., 25 Op. Cal. Att'y Gen. 8, 21 (1955): "As the need of such an inhabitant develops he must comply with the general water law of the state... to apply for and perfect a water right for water which he then needs and can put to beneficial use. ... Specifically, this means that if, prior to the development of the applicant's increased needs, the authority had been exporting from the watershed in question water required to supply the applicant's increased needs, such use by the authority would not justify denial of the application."

²⁴See Robie & Kletzing, supra note 1, at 431 and note 57 where they describe two assignments of state water applications to the Bureau of Reclamation in which specific portions of that

"reasonable share" of the water originating in the upper reaches of stream systems for the residents of those areas.²⁵ More commonly, the process involves a review of transfers to assure that some reasonable amount remains in the area of origin.

A Texas statute passed in 1965 restricts the Texas Water Development Board from developing any plan for a transbasin diversion "if the water supply involved in such a plan or project will be required to supply the reasonably foreseeable future water requirements for the next ensuing fifty-year period within the river basin of origin...."²⁶ In effect, this statute creates a reservation of water needed in areas of origin for a 50-year period as against state sponsored or funded water development.²⁷

Oklahoma law contains the following provision:

In the granting of water rights for the transportation of water for use outside the

water were reserved for the counties of origin.

²⁵N.M. Stat. Ann. §72-5-29 (1978). There is no reported litigation applying this statute. Its apparent intent was to protect early settlers who may have neglected to comply with state water law to perfect their rights. See, E. Clark, *Water Rights Problems in the Upper Rio Grande Watershed and Adjoining Areas*, 11 *Natural Res. J.* 48 (1971).

²⁶ Ch. 297, §2 1965 Tex. Gen. Laws 588, codified at Tex. Water Code Ann. §16.052 (Vernon Supp. 1985).

²⁷Johnson & Knippa, "Transbasin Diversion of Water," 43 *Texas L. Rev.* 1035, 1051 (1969): "Termed derisively by some as the 'fifty-year lockup,' these provisions evidently are intended to assure originating areas sufficient water to meet their anticipated needs for a period of fifty years following the planning of a transbasin project by the Water Development Board or following the decision to finance such a project with state funds."

stream system wherein water originates, applicants within such stream system shall have a right to all of the water required to adequately supply the beneficial needs of water users therein. The Board shall review the needs within such area of origin every five (5) years.²⁸

Although the declared policy of the State is "to encourage the use of surplus and excess water to the extent that the use thereof is not required by people residing within the area where such water originates,"²⁹ a subsequent paragraph adds: "Only excess and surplus water should be utilized outside the areas of origin and citizens within the areas of origin have a prior right to water originating therein to the extent that it may be required for beneficial use therein."³⁰ The Oklahoma Water Resources Board has defined excess and surplus water as "that amount of water which is greater than the present or reasonable foreseeable [sic] future water requirements needed to satisfy all beneficial uses within an area of origin."³¹

²⁸82 O.S. 1981 §105.12 (4).

²⁹82 O.S. 1981 §1086.1

³⁰Id.

³¹Oklahoma Water Resources Board Rules, Regulations and Modes of Procedure §125.1 (1979 Revision). In a case that has been before the Oklahoma Supreme Court for two years, one of the issues is whether out-of-basin diversions remain subject to possible "recall" by subsequent appropriators in the basin of origin. Oklahoma Water Resources Board v. Franco-American Charolaise, Ltd. et. al., Case No. 59, 310. The Board's position is that protection is provided only to those in the area of origin holding water rights or applications for water rights at the time of application for an out-of-basin diversion. Brief of Appellant, Oklahoma Water Resource Board (May 31, 1983) at 37. The Oklahoma District Court had decided that the rights being sought in this case must be made "subject to recall" by subse-

In an interstate context, waters have been formally allocated by two general means--interstate compacts and court decreed equitable apportionment. The Colorado River Compact of 1922³² is the classic example of an interstate compact one of the major purposes of which was to protect the future availability of water for the areas of origin of the Colorado River. Colorado and other upper basin states were concerned that the rapid growth in southern California would result in full appropriation of the Colorado River leaving nothing for their own later development. The permanent division of water incorporated into the compact arrangement was intended to protect development interests in these upstream states.³³

Since the 1907 case of Kansas v. Colorado³⁴ the U.S. Supreme Court has taken original jurisdiction in litigation between states regarding interstate waters. In general, the Court has applied the law of prior appropriation in cases involving states recognizing this doctrine.³⁵ Not surprisingly, emphasis is quent users within the stream system of origin.

³²70 Cong. Rec. 324(1928), approved by Congress in the Boulder Canyon Project Act, Ch. 42, §13, 45 Stat. 1064 (1928), 43 U.S.C. §617(1) (1982).

³³Indeed the lower basin states have long since diverted their full entitlement of 7.5 million acre-feet per year while the upper basin states have yet to apply their full share to beneficial use.

³⁴206 U.S. 46 (1907).

³⁵See the excellent discussion by Tarlock, "The Law of Equitable Apportionment Revisited, Updated and Restated," 56 U. of Colo. L. Rev. 381 (1985).

generally on protection of existing uses and provision for apparent new uses. Area of origin protection has not played a significant role in court decisions under this doctrine.

As demonstrated in the interstate context by the Colorado River, formal reservation of water can assure the future availability of water for slower-developing areas of origin. At the same time such an approach creates inflexibility. It is difficult to project the amount of water that may be needed in such areas of origin. Reservations or apportionments that are fixed become difficult to change even if they no longer make sense.

3. Evaluation. A third general allocation method is to evaluate transbasin diversions on the basis of a number of general standards. Reservation of water is not involved. In appropriation states following the permit system, water rights are established through application with the appropriate state agency. While the requirements vary considerably from state to state, in each case certain conditions must be met.³⁶

In some states, specific provisions address interbasin transfers. A 1981 Nebraska law specifically subjects all proposed interbasin transfers to a public interest review by the

³⁶For example, in states like Wyoming the considerations are limited to a demonstration that the diversion of water is taking place and that the water is being applied to a recognized beneficial use. See Wolfe, "Administering Water Rights: The Permit System," paper presented at Western Water Law in Transition Conference (Natural Resources Law Center, U. of Colorado, June 3-5, 1985). Other states address a broader set of considerations including, in some cases, a general "public interest" standard. See, e.g. Alaska Stat. 46.15.080 (1982); Neb. Stat. S 46-235 (1984); N.M. Stat. Ann. §72-5-7 (1978).

Director of Water Resources.³⁷ A number of factors are listed for consideration, though others also may be raised:

1. The economic, environmental, and other benefits of the proposed interbasin transfer and use;
2. Any adverse impacts of the proposed interbasin transfer and use;
3. Any current beneficial uses being made of the unappropriated water in the basin of origin;
4. Any reasonably foreseeable future beneficial uses of water in the basin of origin;
5. The economic, environmental, and other benefits of leaving the water in the basin of origin for current or future beneficial uses;
6. Alternative sources of water supply available to the applicant; and
7. Alternative sources of water available to the basin of origin for future beneficial uses.³⁸

A cost-benefit analysis from the state perspective is to be undertaken, and the application is to be denied "if the benefits to the state from granting the application do not outweigh the benefits to the state from denying the application."³⁹

³⁷Nebraska Laws 1981, LB252, §6, Neb. Rev. Stat. §46-289 (1984). The first such review under this statute has just been completed. In the Matter of Application A-15738 for a Permit to Divert Water from the South Platte River for Storage in Enders Reservoir (Nov. 4, 1985).

³⁸Id.

³⁹Id. Kansas passed a law in 1983 that follows a very similar approach respecting all proposed diversions of at least 1,000 acre-feet of water per year for use more than 10 miles from the point of diversion. Kansas Laws 1983, Ch. 341, codified at K.S.A. §82a-1501-1506 (1984). One additional factor of interest is "conservation practice implementation plans for the use of water currently available to and being used by the applicant and for the use of the water proposed to be transferred." K.S.A. §82a-1503(d)(6) (1984).

A Texas law originally passed in 1913 now provides that

[n]o person may take or divert any of the water of the ordinary flow, underflow, or storm flow of any stream, watercourse, or watershed in this state into any other natural stream, watercourse, or watershed in this state into any other natural stream, watercourse, or watershed to the prejudice of any person or property situated within the water shed from which the water is proposed to be taken or diverted.⁴⁰

A 1966 Texas Supreme Court decision held that prejudice is to be determined by weighing the detriments to the basin of origin against the benefits of the diversion.⁴¹ The Court concluded that this law prohibited an out of basin diversion "only to the extent such diversion would impair water rights in existence at the time of the proposed diversion."⁴² The prejudice standard permits consideration of reasonable future needs as one of the factors to be evaluated in the permit review by the Texas Water Rights Commission.

The evaluation approach provides some administrative protection for areas of origin. The extent of that protection depends on the evaluation factors to be considered in permitting transbasin diversions and in the weight to be accorded these factors. The Nebraska approach requires consideration of the adverse impacts on the area of origin but evaluates these impacts

⁴⁰Texas Water Code Ann. §11.085 (Vernon Supp. 1985).

⁴¹City of San Antonio v. Water Comm'n, 407 S.W.2d 752, 759 (Tex. 1966). See also, City of Trisco v. Texas Water Rights Comm'n, 579 S.W.2d 66, 69 (Tex. Civ. App. 1979).

⁴²Id.

in relation to the general benefits expected from the diversion. Presumably, mitigation of unacceptable impacts can be required before a permit will be issued. If no artificial reservations of water are included, flexibility is retained in the system.

C. Compensation

The third general approach taken to address area of origin concerns emphasizes compensation. Rather than reserving water, the intent is to make the area of origin better off through provision of benefits that at least offset the costs imposed by the diversion. California took this approach in developing its State Water Project. The Burns-Porter Act, passed in 1959 to create funding for the Project, contained several provisions intended to compensate northern California for the loss of water. One form of compensation was funding for local needs including flood control.⁴³ In addition, the Act established a grants program for recreation and fish enhancement and a loans program for small projects and rehabilitation of domestic water systems.⁴⁴ It should be noted, however, that this law retained the permanent priority status to exported water for residents of the areas of origin discussed previously.⁴⁵

The 1968 Colorado River Basin Project Act adopted a compensation approach to address area of origin concerns. Section

⁴³Cal. Water Code §12938 (West 1971).

⁴⁴Cal. Water Code §§12934(d)(6), 12880-12893 (West 1971).

⁴⁵See text accompanying notes 20-22 supra.

203(a) of the Act provides:

In the event that the Secretary shall... plan works to import water into the Colorado River system from sources outside the natural drainage areas of the system, he shall make provision for adequate and equitable protection of the interests of the States and areas of origin, including assistance from funds specified in this Act to the end that water supplies may be available for use in such states and areas of origin adequate to satisfy their ultimate requirements at prices to users not adversely affected by the exportation of water to the Colorado River system.⁴⁶

The intention was to create a fund of money that could be used to provide water to future users in exporting areas at a reasonable cost.⁴⁷

The Colorado approach, discussed in detail in Section V below, requires a form of compensation for certain transbasin diversions. A 1943 Colorado law requires the diversion facilities for conservancy district projects taking water out of the Colorado River basin to incorporate features that will protect present and future consumptive water uses in that basin and that will not increase the cost of that water.⁴⁸ The practical effect of this provision has been to cause the importing conservancy district to build additional storage reservoirs on the West Slope

⁴⁶Colorado River Basin Project Act, P.L. 90-537, §203(a), 43 U.S.C. §1513(a) (1982).

⁴⁷Apparently, the Development Fund was never adequately financed. See Legal Study No. 7, supra note 1, at 104. Moreover, plans to bring water from the Pacific Northwest into the Colorado River Basin have been postponed indefinitely.

⁴⁸Ch. 192, 1943 Colo. Sess. Laws 635, Colo. Rev. Stat. §37-45-118(b) (IV) (1973).

to provide "compensatory storage" for use in this area.

Because of legislation passed by the rural-dominated New York State Legislature limiting the ability of New York City to take land in upstate counties for its water system unless full compensation is paid, the city enacted a provision governing its approach in such matters.⁴⁹ According to Sax:

In New York the cost of diversion is made even greater by a statutory provision which, in addition to allowing compensation to the owners of riparian land, requires that the owner of any real estate taken by the city which has been directly or indirectly decreased in value by the execution of any plans for additional water supply by the city shall have the right to recover damages for such decrease in value. This provision guarantees compensation to nonriparians who have made use of the river, as well as to business and property owners whose values are diminished simply by the fact that the use of the river is affected.⁵⁰

The courts have taken a broad view of the interests that may be compensable under this provision.

Compensation recognizes that the diversion of water from an area entails real costs and that offsetting payments may be devised that will benefit the exporting area and leave it at least as well off as a result of the diversion. Inclusion of these payments in the cost of the diversion better reflects the true cost of the project. Water is not artificially reserved for

⁴⁹Administrative Code of the City of New York, K51-44.0.

⁵⁰Joseph L. Sax, Water Law, Planning and Policy (Bobbs-Merrill, 1968) at 200.

unknown future uses.⁵¹ At the same time, there are a number of problems associated with the compensation approach. In the absence of a market, who determines what the costs of the diversion are and how much compensation should be paid? What form should the compensation take? To whom is the compensation paid? These questions are addressed more fully below.⁵²

V. THE COLORADO APPROACH

A. General Colorado Doctrine

The seminal case of Coffin v. Left Hand Ditch Co.⁵³ involved a diversion of water out of one drainage into an adjacent watershed. To the argument that such a diversion was unlawful the Colorado Supreme Court replied: "In the absence of legislation to the contrary, we think that the right to water acquired by priority of appropriation thereof is not in any way dependent upon the locus of its application to the beneficial use designed."⁵⁴ The Court went on to discuss the numerous benefits resulting from a rule allowing the movement of water to locations where it can be beneficially applied.

More recently, the Colorado Supreme Court again was presented with the question of the legality of out-of-basin diver-

⁵¹Of course, the Colorado approach of building compensatory storage reservoirs does have the effect of apparently dedicating this water to as yet unknown West Slope uses.

⁵²See especially Section VI infra.

⁵³6 Colo. 443 (1882).

⁵⁴Id. at 449. (emphasis in original).

sions--this time concerning a proposed project that would take water from the Colorado River basin across the mountains to Colorado Springs and Aurora. In an unequivocal statement the Court noted:

We find nothing in the Constitution which even intimates that waters should be retained for use in the watershed where originating.

The waters here involved are the property of the public, not any segment thereof, nor are they dedicated to any geographical portion of the state.

The right to appropriate water and put the same to beneficial use at any place in the state is no longer to open to question.⁵⁵

Thus the general rule in Colorado is that water may be diverted without geographic restriction so long as it is applied to a beneficial use.

B. The Conservancy District Exception

1. Historical Setting. The earliest transmountain diversions in Colorado involved small projects built by private groups. In the 1920's the city of Denver began development of a large transmountain diversion project involving construction of a tunnel under the Continental Divide. Agricultural interests in the northern Front Range became interested in pursuing federal funding to help build a project to divert water from Grand Lake at the head of the Colorado River to the eastern slope by means of a tunnel. These interests joined together as the

⁵⁵Metropolitan Suburban Water Users Association v. Colorado River Water Conservation District, 148 Colo. 173, 202, 365 P.2d 273, 288-89(1961).

Northern Colorado Water Users Association in 1934. Concern about the potential adverse impacts on the West Slope of Colorado of this plan prompted the creation of the Colorado River Protective Association in that same year.

A year earlier, representatives from across the state had met to discuss federal funding for Colorado water projects. The meeting resulted in a five point resolution, one of which endorsed the concept of "compensatory storage":

Fourth, endorsement of the general principle that every transmountain diversion project out of the Colorado River basin, other than domestic projects of municipalities, shall include as an essential part of the project construction of a compensatory reservoir on the Western Slope of sufficient capacity to hold an amount of water equal to the amount to be annually diverted unless some compensating reservoirs have been previously built.⁵⁶

Several points are worth noting. First, the diversions requiring compensatory storage would be only those from the Colorado River basin. Second, "domestic projects of municipalities" were excluded. Third, the compensatory storage was to be in an amount equal to the amount diverted. In the negotiations regarding construction of what came to be known as the Colorado Big Thompson (CBT) Project that ensued over the following four years, the major issue was the amount of compensatory storage to be built.

⁵⁶From Rocky Mountain News, September 28, 1933, quoted in Hobbs, "Green Mountain Reservoir: Lock or Key?" paper presented at Colorado Water Congress Annual Convention, Feb. 23-24, 1984, p.6 [hereinafter Hobbs].

Although Colorado law presented no obstacle to transmountain diversions, the necessity to obtain federal funds greatly strengthened the bargaining position of the West Slope whose congressional representative was powerfully situated:

At the time the foregoing developments occurred, one individual representing the West Slope assumed an outstanding role as protector of that area. Congressman Edward T. Taylor, as Chairman of the Appropriation Committee of the House, was, by virtue of his position, able to enforce his edicts and to preclude the development of any publicly financed project which would divert water from his congressional district to the East Slope, unless the proponents of such project were willing to make such concessions as he deemed necessary.⁵⁷

The position of West Slope interests was further spelled out in 1935 in the so-called "Delaney Resolution." As summarized by Beise:

This resolution acknowledged that all sections of Colorado concede to the area wholly dependent on the Colorado River for water, a prior right to such water then available as was reasonably necessary for the continued growth and development of the western part of the state; that there was no legal method whereby one part of the state could make a binding agreement with another portion of the state to settle the question; that, in the absence of comprehensive surveys, it was reasonable to assume that the West Slope would ultimately use one-half of the water allocated to Colorado from the Colorado River, and, accordingly, to effectuate such assumption every plan for transmountain diversions should incorporate as an integral part thereof at its expense compensatory storage equal to the amount to

⁵⁷Beise, "Compensatory Storage," 22 Rocky Mt. L. Rev. 453, 455 (1950).

be diverted.⁵⁸

By this means, the West Slope hoped to effectively assure that it would maintain rights to a larger share of the water in the Colorado River basin and that the costs of building storage for that water would be borne by East Slope interests.

In 1936 the Bureau of Reclamation completed plans for the CBT Project. Negotiations were then able to move to more specific concerns. An agreement was reached regarding "Manner of Operation of Project Facilities" which incorporated a number of protective conditions. Congressional authorization of the CBT Project in 1937 spelled out this agreement in Senate Document 80.⁵⁹

The CBT Project was expected to divert about 320,000 acre-feet per year. As part of the project the proponents agreed to build the Green Mountain Reservoir to provide water needed to protect West Slope interests. The reservoir capacity of 152,000 acre-feet was to be utilized to replace any out-of-priority diversions required for the CBT (52,000 acre-feet) and to generate power and supply other beneficial uses in western Colorado (100,000 acre feet).⁶⁰ The purposes to be achieved by

⁵⁸Id. at 456.

⁵⁹75th Cong., 1st Sess. (1937).

⁶⁰As is often the case in such situations, much of the concern of the West Slope representatives arose out of uncertainty about the impacts of the proposed diversion. Protective stipulations satisfactory to all concerned were able to be developed once the needs were better understood. For a description of the specific issues, see, Dille, A Brief History of the Northern Colorado Water Conservancy District and The Colorado-Big

operations of the Green Mountain Reservoir are:

1. To preserve the vested and future rights [of the West Slope] in irrigation.
2. To preserve the fishing and recreational facilities and the scenic attractions of Grand Lake, the Colorado River, and the Rocky Mountain National Park.
3. To preserve the present surface elevations of the water in Grand Lake and to prevent a variation in these elevations greater than their normal fluctuation.
4. To so conserve and make use of these waters for irrigation, power, industrial development, and other purposes, as to create the greatest benefits.
5. To maintain conditions of river flow for the benefit of domestic and sanitary uses of this water.⁶¹

Other conditions of the agreement provided that diversions would be subject to the provisions of the Colorado River Compact, that an irrigation system for meadow lands in the vicinity of Kremmling would be provided, that the domestic water supplies of Kremmling and Hot Sulphur Springs would be protected and that Grand County would be paid \$100,000 for estimated loss of tax revenues from the lands to be inundated.⁶²

The need in Colorado to have entities capable of entering into repayment contracts with the Bureau of Reclamation for large water projects led to the passage of the Water Conservancy Act of 1937.⁶³ This law permitted creation of special conservancy districts with authority to tax all property within their

Thompson Project (1958), esp. pp. 15-16.

⁶¹Hobbs, supra note 55 at 9-10.

⁶²Dille, supra note 59, at 16.

⁶³Ch. 266, 1937 Colo. Sess. Laws 1309.

boundaries.⁶⁴

The 1937 Act contained the following restriction:

Provided, however, that not to exceed an annual average amount of 320,000 acre-feet of water, for any period of five consecutive years, reckoned in continuing progressive series, beginning with the first year of transmountain diversion of water, shall be transported from the watershed of any and all rivers subject to the Colorado River Compact and the Boulder Canon Act. (U.S.C. Title 43, Sections 617 to 617-t) by all districts organized or to be organized under this Act, collectively, until such time as a division of water allocated to the several upper basin states under said Compact has been made under agreement between said states, or otherwise determined.⁶⁵

Since the CBT Project was expected to divert 320,000 acre-feet, this provision effectively precluded any other transmountain diversions out of the Colorado River basin by other conservancy districts.

2. The Law. After six years of discussion and negotiation, the legislature removed this restriction and replaced it with the following provision that is still the law today:

Provided, however, that any works or facilities planned and designed for the exportation of water from the natural basin of the Colorado River and its tributaries in Colorado, by any district created under this

⁶⁴Irrigation districts are able only to tax landowners with irrigable acreage within the district to repay bonds. Colo. Rev. Stat. §37-41-121 and §37-42-126(a) (1973). The broader taxing authority for conservancy districts vastly increased the potential ability to finance water projects. Colo. Rev. Stat. §37-45-121 to 125 (1973 & Supp. 1984).

⁶⁵Ch. 266 §13, 1937 Colo. Sess. Laws 1309, 1325.

Act, shall be subject to the provisions of the Colorado River Compact and the Boulder Canyon Project Act, as amended; that any such works or facilities shall be designed, constructed and operated in such a manner that the present appropriations of water, and in addition thereto prospective uses of water for irrigation and other beneficial consumptive-use purposes, including consumptive uses for domestic, mining, and industrial purposes, within the natural basin of the Colorado River in the State of Colorado, from which water is exported, will not be impaired nor increased in cost at the expense of the water users within the said natural basin; and that the facilities and other means for the accomplishment of said purpose shall be incorporated in, and made a part of, any project plans for the exportation of water from said natural basin in Colorado.⁶⁶

Thus, that portion of the West Slope encompassing the Colorado River basin is to be protected from certain adverse effects connected with exportation of water by conservancy districts. In particular, existing uses are not to be impaired or increased in cost. The same protection is accorded to "prospective uses of water for irrigation and other beneficial consumptive-use purposes." The means of assuring these protections are to be included in the plans for any transbasin diversion proposed by a conservancy district.

Several points should be noted. First, as has been stated, these restrictions are limited only to diversions by conservancy districts. Thus, cities such as Denver, Colorado Springs, and Aurora are not required to provide such protections. Second, the prospective uses of water that are protected are limited to

⁶⁶Ch. 192, 1943 Colo. Sess. Laws 635, 636, codified at Colo. Rev. Stat. §37-45-118(b)(IV) (1973).

consumptive uses. Thus water needed for power generation and the maintenance of instream flows may not be included.⁶⁷ Third, the requirement that present and prospective uses are not to be impaired or increased in cost has generally been thought to mean that a compensatory reservoir must be constructed on the West Slope.⁶⁸

3. Judicial Interpretation. Reference has already been made to the case of Metropolitan Suburban Water Users Association v. Colorado River Water Conservation District⁶⁹ in which the Colorado Supreme Court concluded unequivocally that water may be diverted and applied to a beneficial use anywhere in the state.⁷⁰ The entities proposing diversions from the West Slope in that

⁶⁷See Beise, supra note 56, at 458: "The popular concept and application of these words would be to exclude power generation and maintenance of public streams for fishing and scenic attractions, but to include irrigation, domestic, and manufacturing uses of the water."

⁶⁸As Beise notes, exportation of water necessarily reduces available supplies. "Therefore, a practical interpretation of the Act is that a project proposing to divert water from the Colorado River Basin must construct a compensatory reservoir which will leave the West Slope in as good condition for present and future development purposes as if the transporting project had not been constructed and the river involved had remained unregulated." Id. at 459. Beise goes on to point out the substantial uncertainty involved in determining whether a diversion project will increase the costs of future water uses on the West Slope.

⁶⁹Supra note 54.

⁷⁰It is not clear from the opinion what the legal basis was for the argument that the City of Denver cannot engage in transmountain diversions. Apparently, it was not based on an argument that Denver should be covered by the Colorado statute governing conservancy districts.

case were all cities.

A major challenge to the constitutionality of the Colorado area of origin protection statute was raised in Central Colorado Water Conservancy District v. Colorado River Water Conservation District.⁷¹ There the conservancy district argued that the Colorado constitutional provision guaranteeing that "[t]he right to divert the unappropriated waters of any natural stream to beneficial uses shall never be denied"⁷² precluded the restrictions contained in the conservancy district statute. The Court avoided this constitutional issue by noting that such districts are instrumentalities of the state and that their authority is completely established by, and limited to, the statute that creates them. The Court stated: "To say that the legislature cannot impose conditions upon this creature of statute before it could divert water from a natural basin to the district flies in the face of well settled principles of constitutional law."⁷³

In the case of Colorado River Water Conservation District v. Municipal Subdistrict, Northern Colorado Water Conservancy District⁷⁴ the Colorado Supreme Court addressed what a conservancy district must do to comply with the planning requirements of the protection provision. At issue was the plan submitted by

⁷¹186 Colo. 193, 526 P.2d 302 (1974).

⁷²Article XVI, Sec. 6, Constitution of Colorado.

⁷³Central Colorado Water Conservancy District v. Colorado River Water Conservation Board, 186 Colo. 193, 195-196, 526 P.2d 302, 304 (1974).

⁷⁴198 Colo. 352, 610 P.2d 81 (1979).

the Municipal Subdistrict of the Northern Colorado Water Conservancy District in conjunction with its application for a conditional decree for the proposed Windy Gap project. The Court first held that the project plans for accomplishing the protection purposes of the statute must be prepared and submitted to the water court before a conditional decree may be granted.⁷⁵ The Court then found the plan that had been submitted to be insufficient and held that "[t]he plan required by subparagraph IV must be at least as detailed as that necessary to document the elements of an appropriation."⁷⁶ In particular, the Court emphasized the need for such plans to manifest a "physical demonstration of the design, construction, and operational aspects of" the proposed diversion facilities that will achieve the protections required by the statute.⁷⁷

4. Other Experience with Compensatory Storage. In addition to the CBT Project, two other transmountain diversion projects have been built by conservancy districts involving water from the Colorado River basin. The first was the Fryingpan-Arkansas Project. Beginning in the 1920's, agricultural interests in the Arkansas River valley sought to supplement irrigation water supplies.⁷⁸ Bureau of Reclamation investigations began in the late 1930's. The project that was finally approved and funded by

⁷⁵Id. at 356 and 84.

⁷⁶Id. at 357 and 84.

⁷⁷Id. at 358 and 85.

⁷⁸Terence Brace, "The History of the Fryingpan-Arkansas Project" (undated) at 1.

Congress in 1962 involved the diversion of about 69,000 acre-feet per year of water from Hunter Creek and the Roaring Fork River in the Colorado River basin to the Arkansas River for the benefit and use of the Southeastern Colorado Water Conservancy District.⁷⁹

A major issue in obtaining congressional support for the project concerned protection of West Slope interests.⁷⁹ In the "Operating Principles, Fryingpan-Arkansas Project" adopted in 1959 and incorporated into the federal legislation funding the project⁸⁰ it is stated that one of the purposes of the project is the "protection of western Colorado water uses, both existing and potential, in accordance with the declared policy of the State of Colorado."⁸¹ The means of providing that protection was to be construction of the Ruedi Reservoir on the Fryingpan River with a capacity of at least 100,000 acre-feet. A portion of that water

⁷⁹Id. at 42. See also Fryingpan-Arkansas Project (Letter from Acting Secretary of the Interior Transmitting Report on the Fryingpan-Arkansas Project, Colorado, Pursuant to Section 9(A) of the Reclamation Project Act of 1939 (53 Stat. 1187)) (June 18, 1953).

⁷⁹By this time the Congressional representative for the West Slope was Wayne Aspinall, chairman in the early 1950's of the Reclamation Committee and later chairman of the Interior and Insular Affairs Committee. Just as with Representative Taylor in the 1930's, without Representative Aspinall's support, no bill funding this project could hope to pass in the House. Thus the West Slope wielded substantial leverage in the discussions concerning protection of its interests. Brace, supra note 77, at 21.

⁸⁰P.L. 87-590, 76 Stat. 389 (1962).

⁸¹Operating Principles Fryingpan-Arkansas Project, H.R. Doc. No. 130, 87th Cong. 1st Sess. (1961), at 1.

is dedicated to replacement of any senior West Slope water rights affected by project diversions. The remainder is available for other municipal and industrial uses on the West Slope.⁸²

The other transmountain diversion involving the statutory basin of origin protection is the Windy Gap project.⁸³ Some of the storage and transportation facilities of the Colorado-Big Thompson project are utilized to transport water from the Colorado River to primarily municipal users on the East Slope. This totally private project is being funded, constructed, and operated by the Municipal Subdistrict, Northern Colorado Water Conservancy District.⁸⁴ An average annual water supply of 54,000 acre-feet will be furnished by the project.

Initially, the Municipal Subdistrict took the position that Green Mountain Reservoir already satisfied the requirements of the basin of origin protection provision.⁸⁵ However, the

⁸²Correspondence contained in Ruedi Dam and Reservoir, Colo. (Letter from Acting Secretary of the Interior Transmitting A Report and Findings on Ruedi Dam and Reservoir, Colo., Pursuant to the Federal Reclamation Laws) (March 7, 1960) specifically discusses the expected water needs associated with oil shale development in western Colorado.

⁸³Most of the following information came from John M. Sayre, "The Windy Gap Project: A Case Study," Presentation at New Sources of Water for Energy Development and Growth: Interbasin Transfers Conference (Natural Resources Law Center, U. of Colo. School of Law) (June 9, 1982).

⁸⁴Included are the cities of Boulder, Greeley, Longmont, Estes Park, and Loveland and the Platte River Power Authority.

⁸⁵The CBT project was originally planned to divert 310,000 acre-feet. Green Mountain was designed accordingly. In fact, an annual average of 250,000 acre-feet of water has been diverted by

Colorado Supreme Court, in a case previously noted,⁸⁶ disagreed and required the Subdistrict to develop a specific plan constituting "a physical demonstration of the design, construction and operational aspects of diversion facilities required by subparagraph IV."⁸⁷

Negotiations ensued between the Municipal Subdistrict and the Colorado River Water Conservation District (River District) beginning in December, 1979. John Sayre provides an excellent account of these negotiations, discussing the concerns of the various West Slope interests and the settlements eventually reached to satisfy these concerns.⁸⁸ To summarize briefly, concerns about possible increases in salinity were addressed by paying Grand County \$25,000 to conduct salinity studies; concerns by the Town of Hot Sulphur Springs about its water supply and sewage systems were met by payments of \$150,000 for improvements to its water treatment facility and \$270,000 for improvements in its waste water treatment facility; concerns by ranchers about

this project. Since Windy Gap was a project of entities within the Northern Colorado Water Conservancy District and since the additional diversions still would not bring the total to more than the originally planned 310,000 acre-feet, the Subdistrict considered that its obligations were already satisfied by Green Mountain Reservoir.

⁸⁶Colorado River Water Conservation District v. Municipal Subdistrict, Northern Colorado Water Conservancy District, supra note 73.

⁸⁷Id. at 358 and 85.

⁸⁸See supra note 83. See also "Agreement Concerning the Windy Gap Project and the Azure Reservoir and Power Project" (April 30, 1980) and "Supplement to Agreement of April 30, 1980" (March 29, 1985).

possible adverse effects on diversions of senior downstream rights brought a guarantee that the Subdistrict would build any additional facilities that might be needed; concerns by the U.S. Fish and Wildlife Service (FWS) and the Colorado Division of Wildlife regarding potential adverse impacts on fish were addressed by guaranteeing certain minimum streamflows below the reservoir site and donating \$550,000 to FWS for work to protect two species of endangered fishes downstream in the Colorado River; concerns by Grand County and the Middle Park Water Conservancy District regarding availability of water for future development in this area were met by agreeing to provide an additional 3,000 acre-feet of water for this purpose.

The major issue was how to satisfy the protection provision in the Conservancy Act. Under the initial settlement, the Subdistrict agreed to construct the Azure Reservoir and Power Project on the Colorado River. Expected maximum capacity was 28,000 to 30,000 acre-feet with the water rights held by the River District. This agreement was modified in March, 1985 to provide that the Subdistrict pay the River District a sum of \$10,200,000 which the District will use to plan and construct a water storage project or projects in Water Division No. 5 "which will satisfy the Subdistrict's obligation under C.R.S. §37-45-118(1)(b)(IV)...."⁸⁹ In addition, the Subdistrict agreed to subordinate its project water rights to permit filling of the

⁸⁹"Supplement to Agreement of April 30, 1980," supra note 88 at 12 (paragraph 17).

project or projects constructed by the River District.⁹⁰

C. An Evaluation of the Colorado Approach

Colorado has adequate supplies of water to meet its foreseeable needs if these supplies can be made available at the point of demand. Transbasin diversions have represented a significant source of supply in this state.⁹¹ With the withdrawal of federal subsidies and the addition of numerous environmental restrictions, the cost to the builder of these projects has increased markedly. Nevertheless, such projects still represent a potentially important source of supply.

It seems evident from an examination of the circumstances surrounding the origination of the Colorado provision for basin of origin protection that compensatory storage was agreed to because federal funding was available to build the entire transbasin diversion project including the additional storage. As discussed, the bargaining position of the West Slope was exceptionally strong because of the position of its congressional representatives. As a result, two major storage projects have been built without cost to the West Slope. At the same time, the

⁹⁰Id. at 5 (paragraph 3).

⁹¹According to one source, an average of 540,000 acre-feet per year (based on 1979 conditions) is imported from other river basins in Colorado. Colorado Water Study: Background Volume (Colorado Department of Natural Resources, September 1981 at 12, Table 3.) Most of this water is diverted from the upper Colorado River basin to the front range. Since the annual consumptive use of water in Colorado is estimated at about 5.2 million acre-feet, transbasin diversions represent about ten percent of total consumption.

East Slope conservancy districts gained access to exceedingly low cost federal funding and construction support. It was a deal no one could turn down.

Seen in this light, it is clear why the Colorado law is aimed only at conservancy districts. These entities were authorized specifically to be able to tap into federal reclamation funding. Federal largess enabled the additional cost represented by compensatory storage to be more easily absorbed into project costs. Since the City of Denver was financing its projects without federal support it was excluded from having to provide compensatory storage.

With major federal financing for water storage projects no longer available it is time to reevaluate the compensatory storage concept. Such projects are expensive to build. There are few remaining sites that are both technically desirable and environmentally and politically acceptable. Apparently little demand has yet developed for the storage already constructed.⁹²

Of course, the law itself does not require construction of compensatory storage. It only requires that present appropriation and prospective consumptive uses of water not be "impaired nor increased in cost at the expense of the water users within

⁹²In 1984 Exxon obtained the first long-term service contract from the Bureau of Reclamation for 7,200 acre-feet of water from Ruedi Reservoir to be used in connection with its Colony Oil Shale Project. Porzak, "Innovative Transfer and Exchange Plans," Paper presented at Conference on Colorado Water Issues and Options, October 9, 1985 at 9.

the said natural basin."⁹³ The provision then refers to the facilities "and other means" that will be utilized to accomplish this purpose. When the Bureau of Reclamation was building such projects it may have made sense to satisfy this requirement through compensatory storage. Now, however, it is time to consider some alternative approaches.

The requirement that present appropriations of water not be impaired or increased in cost can be addressed through mitigation measures determined by engineering and hydrologic studies of project effects. As the Windy Gap example has shown, potentially impacted interests are likely to come forward to seek protection. In that case, mitigation and compensation measures were agreed to through a negotiation process.

The protection to be accorded to prospective consumptive use of water is more problematic. Such prospective uses are inherently speculative. It is difficult to know now how to insure that such unknown uses will not be impaired or increased in cost. Compensatory storage does address this concern but at a cost that may no longer be acceptable. Rather than committing limited resources to such projects it may make more sense to establish a development fund, the money from which would be available to provide assistance for future water needs in the basin of origin.⁹⁴

⁹³Colo. Rev. Stat. §37-45-118(b) (IV) (1973).

⁹⁴Governor Lamm has recommended a "basin of origin equity fund." ("Whose Water Will It Be/What Future Does It Shape for Colorado?" Presentation at Tenth Annual Water Workshop,

Moreover, it seems unwise to focus only on prospective consumptive uses. Many feel that the economic future of the West Slope is tied largely to recreation. In this context it may be that instream flows will be more important in the future than traditional consumptive uses such as agriculture.

As noted, the Colorado provision applies only to the upper Colorado River basin. As a matter of general principle, there is no reason why some form of protection should not be provided to any basin of origin. Moreover, there is no good reason to limit

Gunnison, Colorado, July 31, 1985). As developed in testimony by David Getches, this approach would incorporate the following elements:

* For every acre-foot of water diverted out of a primary river basin each year, an export fee (to be set by the legislature, perhaps indexed to the current price of water in the watershed of origin) will be paid by the importer.

* Export fees will be held by the state in a special fund for the exclusive benefit of the specific watershed of origin.

* Expenditures will be made against the watershed's funds upon action of the Colorado Water Conservation Board for projects proposed by municipalities, conservancy districts, and other public entities within that watershed of origin.

* Appropriate expenditures include: new storage projects; repair and rehabilitation of existing water storage and delivery facilities; municipal water systems; improvement of irrigation systems; on-farm improvements that result in greater efficiency; water-based recreation facilities; securing instream flows; and other water-related projects.

* An exporter who has already invested in compensatory storage in connection with the particular trans-basin diversion would be exempt from paying export charges.

* Export fees will also be imposed on water used under Colorado water rights for beneficial uses in other states (whether or not in the watershed of origin). Testimony by David H. Getches to Interim Committee of the Colorado Legislature on Water and Land Issues, Sept. 12, 1985.

such protection only to projects undertaken by conservancy districts. The same general issues are raised in any such diversion.

It has been suggested that the constitutional provision stating that the "right to divert the unappropriated waters of any natural stream to beneficial uses shall never be denied"⁹⁵ limits the legislature's ability to protect basins of origin.⁹⁶ As discussed, the legality of transbasin diversions is well established in Colorado.⁹⁷ However, it is also well established that the legislature may impose reasonable conditions on the diversion of water. As the Colorado Supreme Court observed in 1885: "While the legislature cannot prohibit the appropriation or diversion of unappropriated water, for useful purposes, from natural streams upon the public domain, that body has the power to regulate the manner of effecting such appropriation or diversion."⁹⁸

The challenge to the 1943 statute restricting transbasin

⁹⁵Article XVI, Sec. 6, Constitution of Colorado.

⁹⁶Carlson, "Report to Governor John A. Love on Certain Colorado Water Law Problems," 50 Denver L. J. 293, 306 (1973).

⁹⁷See text accompanying notes 53-55 supra.

⁹⁸Larimer County Reservoir Co. v. People ex rel. Luthe, 8 Colo. 614, 9 P. 794, 797 (1885). Cases in which the Colorado Supreme Court has approved such legislative restrictions are cited in City and County of Denver v. Bergland, 517 F. Supp. 155 (D. Colo. 1981) at 207 and 208. Note that in Coffin v. Left Hand Ditch Co., 6 Colo. 443 (1882), the Court approved an out-of-watershed diversion "[i]n the absence of legislation to the contrary...." See also, Note, "Constitutionality of Colorado Statutes Providing for Transmountain Water Diversions," 25 Rocky Mt. L. Rev. 363, esp. 366-67 (1953)

diversions by conservancy districts was decided on the grounds of legislative control over entities created by statute.⁹⁹ Thus the question whether the Colorado Constitution prohibits such a provision for nonstatutorily-created diverters was avoided. Certainly the Constitution prohibits legislation taking away the right to divert unappropriated water. Moreover, case law suggests that there can be no geographic preferences accorded to would-be appropriators.¹⁰⁰ Beyond these limitations, however, it is evident that the legislature may seek to promote legitimate state interests by prescribing reasonable conditions on diversions. Any legislative scheme aimed at providing protection for important area of origin interests must be able to meet this standard.

There may also be some question regarding the status of home rule cities within any such legislative scheme. Home rule cities such as Denver and Colorado Springs enjoy a special status under the Colorado Constitution.¹⁰¹ As a matter of constitutional authority they are given the powers "necessary, requisite or proper for the government and administration of its local and municipal matters,"¹⁰² The authority of home rule cities

⁹⁹Central Colorado Water Conservancy District v. Colorado Water Conservation District, 186 Colo. 193, 526 P.2d 302 (1974). See text accompanying notes 71-73 supra.

¹⁰⁰Metropolitan Suburban Water Users Association v. Colorado River Water Conservation District, 148 Colo. 173, 365 P.2d 273 (1961).

¹⁰¹Article XX, Constitution of Colorado.

¹⁰²Id. Sec. 6.

regarding their own local and municipal matters is considered absolute. In a case involving a state statute creating a special procedure for the use of eminent domain authority by cities to condemn water rights, the Colorado Supreme Court ruled that condemnation was a matter of local, not statewide, concern since this authority was specifically granted in the Constitution and that the statute was not permissible.¹⁰³

Thus any statute purporting to affect home rule cities must involve matters of statewide concern in which state legislative authority is paramount. The administration and management of Colorado's water resources are governed by legislatively-established statutes.¹⁰⁴ These statutes contain conditions regulating the appropriation of water to which home rule cities, like any other appropriator, must adhere. Unless the water right matter being legislated invades the zone of authority reserved for home rule cities--such as condemnation of water rights--it is likely to fall within the affairs governed by the state legislature. Nevertheless, since any legislative scheme involving transbasin diversions is likely to affect the interest home rule cities may have in obtaining water from another river basin, a challenge based on the special status accorded home rule cities is possible.

In summary, the present Colorado approach seems inadequate

¹⁰³City of Thornton v. Farmers' Reservoir and Irrigation Co., 575 P.2d 382 (1978).

¹⁰⁴The major provisions are found at Colo. Rev. Stat. §§37-82-101 et seq.

in several respects. First, it protects only the Colorado River basin and only as against out-of-basin diversions by conservancy districts. Second, it provides prospective protection only to consumptive water uses--neglecting highly valuable recreational and other instream values. Third, its requirement that consumptive uses not be increased in cost to future users is both vague and inappropriate--at least as interpreted to require compensatory storage.

VI. ECONOMIC ANALYSIS OF AREA-OF-ORIGIN COMPENSATION (PROTECTION) SCHEMES

This section presents an economic analysis of the issue of area of origin compensation. It begins with a consideration of the rationales for compensation and then presents two conditions which must be met for a transbasin diversion to be economically desirable: (1) that it be the least-cost source of reliable water supply to the prospective user; and (2) that its benefits exceed all related costs. Forms of compensation are then considered. The section ends with a set of general economic guidelines for designing compensation schemes.

A. Why Compensate Areas of Origin?

Why should the export of water be treated differently from the export of any natural resource? In forested areas, no pretense is made of maintaining local lumber or firewood prices as the area is logged. Local areas are not compensated for the removal of coal or ores beyond the royalties paid directly to

resource owners, and there certainly is no guarantee that the local price of coal won't rise above what it would have been in the absence of exports. Why is water viewed differently? Two reasons stand out: (1) water exports usually come from unappropriated water, acquisition of which does not require payment to residents of the basin; and (2) water exports generally do not provide a continuing base for employment and local taxation as do mineral or forestry activities. No one gets paid because no one can get title to unappropriated water without putting it to a beneficial use. Naturally, water remains unappropriated because there are no currently profitable uses in the basin. Then, once the infrastructure for water export is built, no significant employment is provided.

From an administrative and economic point of view, there are two reasons for paying some form of compensation: (1) equity to damaged parties and (2) to make sure that those planning out-of-basin transfers take into account all of the costs caused by the proposed transfer. Equity is the more obvious motivation, for if parties are injured by acts intended to benefit others that are beyond the injured parties' control and in which they had no voice, it seems reasonable that the injured parties should be compensated so they will be no worse off than before. Naturally, it may be difficult to identify all the injured parties and it may be equally difficult to quantify an equitable level of compensation. It is important to note that most transfers are imposed involuntarily on basin-of-origin occupants. Transfers

are not usually market transactions that generate explicit values, and even when market values exist, they may not be good measures of losses involuntarily assumed by basin occupants.

The second point relates to economic efficiency: decisions should be made so the excess of benefits generated over costs incurred is maximized. Since many decisions (including most out-of-basin transfers) are left to private decision-makers or public entities below the state level, it is desirable to create a legal environment in which the decision-making entity must take into account all costs imposed by their decisions. If out-of-basin transfers impose costs on the area of origin that are currently unidentified and/or for which the decision-making unit has no legal liability, then requiring payment of compensation in the amount of these costs becomes a way of being sure that those costs will be taken into account in deciding whether or not to undertake the transfer. Naturally, if the burden of such a cost is to be placed on prospective transferers, the amount of compensation should be limited to the actual costs imposed so that beneficial transfers are not discouraged.

Closely related to both economic efficiency of transfers and to equity is the basic Pareto criterion for decision-making: the only way we can be sure that a new project is socially desirable is to be sure that no one is made worse off by the project. Thus, not only must aggregate benefits exceed aggregate costs, but compensation in the amount of losses must actually be paid to all losers.

B. Economically Efficient Transbasin Diversions

We start by considering the conditions that must hold if an out-of-basin transfer project is to be considered desirable from an economic point of view. Two conditions are required: (1) the transfer must be the least-cost alternative for providing that quantity of water to the users; (2) the benefits to the users of the transferred water must exceed:

(a) losses to the area of origin (including downstream basins to which it may be tributary); plus

(b) transfer-related construction and operation costs.¹⁰⁵

Although these conditions seem self-evident, they require careful explication so they can be properly translated into operational guidelines.

1. Least-Cost Source of Water Supply. The first condition for evaluating an interbasin transfer is that it should represent the lowest cost source of water supply available to the importing

¹⁰⁵These conditions closely parallel the economic criteria for assessing interbasin transfers proposals suggested by the National Water Commission, supra note 1, at 320:

First, the interbasin transfer proposal should be the least-cost source of water supply to serve the purposes at hand. Second, the value of the water in its new uses should be greater than the value of water in its old uses plus the cost of transfer. In other words, benefits (appropriately reduced to reflect foregone future use in the area of origin) should exceed costs.

area. As discussed, such transbasin diversions entail real costs to the area of origin. If other, lower-cost sources of equally reliable supply can be found, then they should be used. In either case, the benefits to the area requiring the water remain the same. It is simply a question of finding the least-cost means of providing those benefits.

According to the National Water Commission,

All alternative sources of water should be evaluated and compared. Costs of foregone future uses in the area of origin and the environmental costs should be included in the evaluation. Two basic points of the "least-cost alternative" criterion are that (1) the calculation of costs of alternatives should be made on one, uniform, consistent basis and (2) all social costs should be included in the evaluation.¹⁰⁶

It may be argued that such an evaluation is unnecessary since, presumably, the transferring entity is economically rational and will therefore seek the lowest cost alternative. In the past, the massive subsidies available in the federal reclamation program made large-scale transbasin diversion projects artificially attractive. Such subsidies will be far less available in the future, though many states are looking for ways to develop other sources of low cost financial support for such projects.

In addition to artificial financial incentives, water-seeking entities are likely to be influenced by other factors. For example, there may be institutional and political problems

¹⁰⁶Howe, Charles W. and K. William Easter, Interbasin Transfers of Water: Economic Issues and Impacts, Baltimore Md.: Johns Hopkins Press for Resources for the Future, Inc. 1971, Ch. 6.

associated with transferring water from existing uses within its own watershed or basin. Thus, even if there is water available for transfer from agricultural uses to, say, urban uses, significant political obstacles may exist. Alternatively, groundwater resources may be available in considerable supply but legal and institutional obstacles may constrain access. Still another alternative may be to meter the use of water and to increase its price. Even if economically efficient, such an approach may be considered politically unacceptable. Irrespective of the apparent impediments, all feasible alternatives should be included in this evaluation.

2. Benefits Must Exceed Costs. The benefits associated with out-of basin transfers are frequently taken for granted, the initiative of the transferor being accepted evidence of the need for the water. However, in the case of transfers for irrigation application, benefits to the intended user are frequently overstated by the existence of price-support programs and water subsidies. Howe and Easter (1971) exhibited the facts that much of the post-war expansion of irrigation in the western United States simply displaced other acreage, often in the same counties. That is land was being put into the soil bank program, while new irrigated acreage was being established next door. The effects extended to other parts of the country, too, with large rainfed acreages being displaced in the Southeast and Mississippi Delta.

Even in cases of transfer for urban uses, evidence is sometimes lacking that there is a real demand for the water. The Windy Gap Project of the Northern Colorado Water Conservancy District has been completed, but the member cities don't need the water and are having difficulty in meeting their project costs.¹⁰⁷

Two major issues arise: determining the appropriate geographic area within which to measure costs; and defining the nature of the losses to the area of origin. First, one must define the area within which costs resulting from a transfer are measured. These losses could occur far downstream, outside what people would ordinarily consider the basin of origin. For example, if Blue River water (tributary to the upper Colorado) is diverted to the Eastern Slope of the Rockies, some losses might be incurred on the Blue itself, some on the Colorado mainstem within the State of Colorado, and some much further downstream, possibly in Arizona and California.

This is a question of the "accounting stance" that is to be used to quantify the benefits and costs mentioned in (1) and (2) above. From a national point of view, any losses caused by the transfer should be counted as costs of the project. In practice however, accounting stances are likely to be determined by the geographic boundaries of public administrative units, from conservancy districts, to states, regions and the nation.

¹⁰⁷Boulder Daily Camera 2/21/83; 10/18/84, p. 4C; 6/28/85; 11/28/85, p. 16B.

Differences in the consequent costs and benefits frequently lead to conflicts among jurisdictions over the desirability of various actions or projects, including the need for compensation. While it is important to consider all costs and benefits, the following discussion is largely in terms of a state accounting stance since state policy is our primary consideration.

Losses to the area of origin are likely to take three main forms: (1) current and future losses of net income directly indirectly associated with diversions and consumptive uses that are curtailed because of a water transfer; (2) current and future losses of instream values; (3) losses of incomes in activities linked to those diversions and instream values; and (4) losses which accrue to "society at large" in the area of origin.

Regarding (1), three classes of potentially affected activities stand out: (a) currently operating direct diverters and consumers of water; (b) users of the return flows from the initial diverters; and (c) future water-using activities that currently do not exist. Currently operating activities that are curtailed by a transfer are observable and their losses of net income can be determined. Return flows from these existing activities can be estimated and associated income losses can also be estimated.

Future uses of water must be forecasted, using some type of forecasting procedures or models. Many states have detailed state economic models, like Colorado's Forecasting and Simulation Model. Such models permit forecasting on a county or planning

region basis, relating these forecasts to credible national forecasts (such as the Wharton School Forecasts or those of Data Resources, Inc.). Such models work reasonably well in forecasting future levels of existing activities, but they cannot invent activities not already on the scene.

Reservation of water for in-basin future uses is somewhat at odds with prior appropriation doctrine which emphasizes present beneficial use of water. However, several western states now allow state agencies to reserve water for future purposes. Colorado law recognizes "conditional" water rights which an applicant may obtain now for intended future use.¹⁰⁸ To maintain such rights, "due diligence" toward applying that water to a beneficial use must be demonstrated to the water court every four years by exhibiting studies, investments, or other concrete actions to show that progress towards use of the water is being made. There has been a shift toward stricter interpretation of due diligence in recent years. On the Colorado River Basin, most conditional rights have been established by prospective exporters, especially cities. Perhaps a more common way of reserving water for future use is to acquire existing water rights and leave that water in its current use until needed for new activities.¹⁰⁹ Though uncertain, future water uses must be

¹⁰⁸For a recent discussion, see Hallford, Developments in Conditional Water Rights Law, 14 The Colorado Lawyer 353 (1985).

¹⁰⁹For a discussion of the inefficiencies of this system see Williams, The Requirement of Beneficial Use as a Cause of Waste in Water Resource Development," 23 Nat. Res. J. 7 (1983).

considered.

The analysis of instream uses (2. above) is much the same, in that there may be direct curtailment of current instream values and further future losses of instream values. There is likely to be immediate loss of some instream values, even in cases involving no immediate loss of income to water diverters. For example, on smaller streams, transfers may make it more difficult for towns and industries to meet ambient water quality standards, forcing them to undertake higher levels of waste treatment.

Regarding (3), there are likely to be at least temporary losses of income in activities linked to the major water-using sectors. If a direct water using activity such as irrigated agriculture is curtailed, certain "backward linked" industries like farm equipment and chemical suppliers and certain "forward linked" industries like livestock, food processing, and meat packing industries will find the demand for their services reduced with consequent reductions in their net incomes. Some of the human and other resources consequently left unemployed will find new employment, but for those left unemployed over various time intervals, the income losses are attributable to the transfer. These income losses can be estimated but are subject to substantial uncertainty.

Finally, some losses (4. above) may indirectly occur "to society at large" in the basin of origin through under-utilization of public facilities, decline in the tax base, reduction in

quality of public services, and possibly as a result of selective migration that leaves a less capable population behind.

Direct diverters and users of return flows are afforded protection from damage under the existing appropriation doctrine. Water can be taken from current uses only through purchase or condemnation. In either case, appropriate prices (compensation) would be paid to the direct water users. Junior appropriators can seek protection against any injury during the court or permit proceedings. Thus, only four classes of damaged parties potentially warrant compensation beyond that presently assured under the prior appropriation doctrine:

- (1) parties indirectly suffering employment and income losses from curtailment of direct and instream uses;
- (2) all unprotected current and future instream uses;
- (3) future direct uses not currently in place; and
- (4) the "public at large" in the area of origin who experience lower quality public services.

Since many of these values lie in the future, we must equate them to present values for purposes of determining appropriate compensation. The procedure for accomplishing this equivalence is known as "discounting."¹¹⁰

¹¹⁰A dollar now is worth more than a dollar later because today's money can be invested at some interest rate. If r is the rate of interest, the future value $FV(t)$ t years hence of N dollars received today would be:

$$(1) FV(t) = (1 + r)^t N$$

In this sense, N represents the "present value" (PV) of $FV(t)$ to be received t years from now, or dividing by $(1 + r)^t$,

$$(2) PV = \frac{FV(t)}{(1 + r)^t}$$

C. Appropriate Forms of Compensation

Thus far, it has been argued that the amount of compensation to be paid by the parties transferring water out-of-basin should be the present value of all current and future losses imposed on unprotected parties, i.e. those not automatically compensated by sale of water rights nor protected from injury by the courts. What of the form that compensation should take? Generally speaking, the most useful form of compensation would be an unrestricted monetary grant of the appropriate present value, placed in escrow at interest, and to be used by the basin of origin to compensate unprotected parties and for whatever other purposes its citizenry prefers.

Compensation should definitely not be aimed at keeping water prices or costs of water development to in-basin users from rising as water becomes scarcer. Water prices should reflect the real scarcity value of water. As water is transferred outside a basin because of its greater value there, water does become scarcer in the basin than it otherwise would have been. The cost

If there exists a sequence of future values, $FV(1)$, $FV(2)$, ..., $FV(t)$, each to be received in the corresponding future years, a present value can be computed for the entire sequence by adding the individual annual present values:

$$(3) \quad PV = \frac{FV(1)}{(1+r)} + \frac{FV(2)}{(1+r)^2} + \dots + \frac{FV(t)}{(1+r)^t}$$

The selection of an appropriate interest rate (or a discount rate) r is somewhat controversial, but for public sector purposes (and assuming no inflation) a rate in the five to ten percent range is generally chosen in practice.

of water to users should then reflect the fact of this scarcity and not the scarcity of some by-gone era. The effect of provisions like those in the Colorado Water Conservancy District Act quoted earlier, that "present...and...prospective appropriations of water...will not be impaired nor increased in cost" is to distort the real scarcity signals to in-basin water users and to induce them to apply water to uses and in quantities that are not justifiable in light of current scarcities.

It is not clear that compensatory storage will always be the form of compensation most useful to the area of origin. Perhaps schools, highways, or hospitals would be of greater benefit, given the hydrologic situation and other needs. Even when storage is determined to be the most useful form of compensation, there is the issue of timing of construction of that storage. Clearly, it should be sized and timed in accordance with the needs of the area of origin. One official, mistaking inefficiency for foresight, recently stated, "We built Green Mountain Reservoir 45 years ago, and now we need it." This is not good economic logic, but the project was acceptable to both sides largely because the federal government paid most of the cost.

These observations also have some implications for the appropriate institutions to negotiate for and manage the resources gained from compensation. If negotiations over losses are to represent all of the unprotected losing parties identified above and if the uses of these compensatory resources are to be determined in the interest of all losing parties and not just

water users, then a governmental unit of general jurisdiction should control negotiations and manage the use of the resultant compensatory resources.

D. General Economic Guidelines for Compensation

1. Compensation paid should equal the present value of net incomes and public amenities lost in the area of origin, less the price paid (if any) for the water rights involved in the transfer. The relevant categories of lost income and amenities are:

(a) future net income that would be generated directly and indirectly in the basin by future diversion uses of currently unused waters;

(b) current and future values and incomes directly and indirectly associated with instream uses; and

(c) losses to the general public from deterioration of public services and quality of life.

2. Compensation should not be restricted to construction of water storage nor to funding restricted to that final use. Payment should be made to agencies not faced with this constraint if possible, i.e. to units of general government.

3. Compensation should not aim at keeping the price of water to the user below its real scarcity value in the state.

4. If water storage is the most efficient form of compensation from the area of origin's viewpoint, construction of the storage facilities should be delayed until they are actually

needed. The needed money payment would be the present value of the planning, filing, land acquisition, and construction costs.

5. The amount of compensation that should be paid to losing parties should be based on the assumption that those parties will act rationally to adapt to the new water supply situation, i.e. that they will undertake all cost-effective steps to minimize their income losses in the face of diminished water.

6. These principles should be applied to all out-of-basin transfers, not only to those executed by conservancy districts.

VII. CONCLUSION

The fundamental principle of the appropriation doctrine favoring the beneficial use of water irrespective of location is still sound. In an arid climate, water must be free to move to the point of demand when warranted by the social and economic conditions. Artificial restrictions hindering this movement should be minimized. At the same time, the area of origin has legitimate interests that should be acknowledged in such diversions.

As a general principle, transbasin diversions should not occur unless they represent the least-cost source of water for the importing region. In addition, such diversions should not be undertaken unless the total benefits in the importing region exceed the costs to the exporting region plus the cost of the transfer facilities. Costs to the exporting area are represented by the present value of incomes lost.

Application of the foregoing economic guidelines to various types of areas of origin protection clearly indicates the superiority of some approaches over others: prohibition, recapture, assignment of permanent priorities, and direct reservation of water bear no relationship to the actual costs to the area-of-origin nor to the benefits in the area of use. Those states with administrative control of water appropriations such as Nebraska and Kansas¹¹¹ may be able to incorporate these principles into their review process. The Colorado approach, though compensatory in nature, has a number of important shortcomings.

Unnecessary restrictions on such transfers can be avoided by allowing compensation to be considered. Compensation provides a means to offset lost opportunity costs in the basin of origin while assuring that the transferring entity has made its choice with full recognition of the costs involved. In this way the objectives of equity as well as economic efficiency may be enhanced.

Some difficult legal and policy issues remain in implementing these principles. For example, the appropriate area of origin must be determined. Considerations here include the need for clarity in definition,¹¹² the desirability of utilizing

¹¹¹See text accompanying notes 37-39 supra.

¹¹²Terms such as "basin," watershed," "stream system," and "drainage" are imprecise and have different meanings to different people. As has been pointed out, "[t]he physical limits of a basin or watershed are not always well-defined, nor does the entity necessarily serve as a practical unit for administering

governmental boundaries rather than purely hydrologic boundaries,¹¹³ and the extent of the watershed area to be included.¹¹⁴

A second important area concerns the matter of compensation. Many of the potentially adverse effects of a water transfer are already addressed. For example, senior water rights are protected in all respects under the prior appropriation system. Even junior water rights, if they exist, are entitled to protection assuring maintenance of stream conditions as they existed at the time their rights were established.¹¹⁵ Mitigation of adverse environmental effects is likely to be addressed as a result of existing environmental protection requirements.

However, some potential costs associated with transbasin

water rights." Westphal and Lawler, "Commitments, Priorities, and Organizational Options for Water Resources Planning in Oklahoma," Oklahoma Water Resources Research Institute (August 1979) at 91. A major issue in the case of The Oklahoma Water Resource Board v. Franco-American Charolaise, Ltd., supra note 30, turns on whether a diversion of water from a drainage by a city primarily located in an adjacent drainage but also partly located in the original drainage constitutes out-of-basin use under Oklahoma law. Such issues suggest the need for clarity in defining the area of origin.

¹¹³For example, a county could theoretically encompass more than one basin of origin.

¹¹⁴Conceivably, all transfers could be subjected to review based on these principles. Kansas takes the approach of reviewing only those transfers greater than 10 miles from the point of diversion. See note 39 supra. Alternatively, transfers in which the water never returns to the same stream system anywhere within the state could be the subject of review. Individual characteristics and concerns of each state would affect this choice.

¹¹⁵See, e.g., Farmers Highline Canal & Reservoir Co. v. City of Golden, 129 Colo. 575, 272 P.2d 629 (1954).

diversions are more difficult to address. There is no ready way to evaluate the degree to which transbasin diversion of water will affect future growth and development in the basin of origin. Such an assessment necessarily must be based on a large number of assumptions regarding highly speculative future events. The multiple difficulties in such an undertaking suggest the need to look for viable alternatives. One such alternative may be a transfer fee analogous to a mineral severance tax. Funds collected as a result of such a fee could be made available to appropriate units within the basin of origin for investments that would benefit the area.¹¹⁶

Compensation, if properly designed, may avoid the need to unnecessarily restrict transbasin diversions. Coupled with appropriate mitigation, a compensation mechanism can address the concerns of areas of origin while at the same time permitting the movement of scarce water resources to the point of greatest need. This ability to respond to the broad needs of an effective system of water allocation makes compensation an attractive approach.

¹¹⁶Funds would also be available to compensate specific costs not addressed for whatever reason during the initial transfer process. For example, some costs might not be apparent at the time of this initial process. Such costs could be compensated out of such a fund.