

A Proposal for Improved Management of Interjurisdictional Water Transfer

by William E. Cox and Leonard A. Shabman*

The present way of resolving water transfer fights is uncertain and, consequently, divisive. Rather than scrapping the system in favor of a permit program administered by a large bureaucracy, however, the authors suggest a middle way-one they believe protects the environment and fairly treats both "importers" and "exporters."

INTRODUCTION

Conflict associated with proposals to transfer water across local political boundaries has been a major water management issue in Virginia in recent years. The most prominent example has occurred in the southeastern region of the state where the City of Virginia Beach is proposing a 60 million gallon per day transfer from Lake Gaston on the Roanoke River. This proposal has generated significant conflict within Virginia and between the states of Virginia and North Carolina, and several legal proceedings have been initiated and await resolution. Other legal actions are likely if the proposal continues to be pursued. Conflicts have also arisen in connection with water supply development attempts in other areas of the state. Action by the City of Newport News to explore the possibility of transferring water from the Pamunkey River was met with opposition from local governments within the Pamunkey Basin. Attempts by the City of Bedford to develop groundwater within Bedford County were contested and resulted in initiation of law suits subsequently resolved by out-of-court settlement. Significant controversy has occurred in the Roanoke Valley over the most desirable approach to water resource development for water supply and flood protection.

Water supply conflict has raised the question of whether Virginia's water allocation system should be changed to facilitate conflict resolution. The existing system is primarily a common-law approach that has evolved in the courts during the history of the Commonwealth. Aside from a permitting program that regulates groundwater use in the southeastern part of the state and on the Eastern Shore, water rights are not administered by any governmental agency but arise as a consequence of ownership of land in contact with a body of surface water or land overlying groundwater. Disputes over water use are resolved through lawsuits between the competing parties. The executive branch of state government exercises control over certain water development activities, but these regulatory actions do not displace the common-law system of water law but operate as a supplement to the common law.¹

Recent history indicates that the existing system tends to perpetuate conflict involving major water development proposals rather than facilitate timely resolution in a manner beneficial to the citizens of the state as a whole and equitable to those most directly affected. Since the existing system does not involve centralized state control over water development and use, resolution of conflict depends substantially on negotiation among interested parties within the framework of judicially defined property rights and related governmental controls. However, negotiation within the existing framework is impeded by several factors.

One factor limiting negotiation concerning water transfer is the inadequacy of information available to the interested parties. Negotiation concerning water transfer depends on formation of accurate, commonly held perceptions concerning such issues as the physical impacts of transfer and the value of water in its alternative uses. Uncertainties concerning such items as potential aquifer yields, reservoir drawdowns associated with withdrawals,

*Respectively, associate professor of civil engineering and professor of agricultural economics, Virginia Tech.

and fisheries impacts associated with proposed development lead to widely varying perceptions among potential negotiating parties, a condition adverse to successful negotiation.

A second important constraint on negotiated solutions to water transfer conflicts is uncertainty in property rights associated with water. Successful negotiation requires certainty in the property interests involved since the parties must clearly understand what is being traded and be assured of the enforceability of any agreement reached. Such certainty is not a characteristic of the common-law system of water rights that predominates in Virginia. Such rights generally are not recorded nor even quantified. Actual water use may provide an indication of water rights in some situations, but water rights may exceed actual use. In fact, water rights can exist in the total absence of water use under Virginia's water doctrines. Under these conditions, negotiated acquisition of water rights from specific parties would not necessarily preclude other parties from presenting conflicting claims at a later time. Certainty of groundwater rights may be greater within the special management districts where a permit program is administered, but the existence of significant classes of exempted uses (agricultural withdrawals and municipal withdrawals for domestic purposes) creates a degree of continuing uncertainty.

A third limitation on negotiated solutions to water transfer conflicts is the tendency of the existing institutional structure to impose high negotiation costs. The current system is characterized by a variety of independent decision points involving the courts, local governments, and state and federal agencies. Resolving water-rights issues is particularly difficult due to the large number of individual parties involved. The absence of a forum for consolidating or coordinating the various decision processes significantly impedes the negotiation process.

The difficulties of resolving conflicts arising from water transfer proposals under existing water management institutions has stimulated interest in institutional modification. This interest resulted in the creation in 1977 of the State Water Study Commission, a legislative commission given responsibility of evaluating the need for change and alternative approaches that could be taken to improve state management capabilities.² The Commission, established as a permanent state agency in 1984 after several temporary continuances,³ has considered two basic institutional changes: adoption of a comprehensive water-use permitting program and adoption of a special decision-making process for resolving

Lack of information, uncertainty of property rights, and high costs make negotiating a water transfer within the existing institutional framework very difficult.

conflict over water transfer for public supply purposes. The Commission has not endorsed either approach to date.

This special report presents the case for adoption of the transfer management approach and proposes a conceptual design for such a decision-making process. The more limited of the two approaches appears to be the appropriate response to conditions currently existing and expected to exist for some time within Virginia. Most of the recent conflict has involved efforts to satisfy the concentrated and growing water demands of urban areas by transferring water from localities with relatively abundant water supplies. The absence of widespread conflict among water users in general indicates that comprehensive regulation of water use is unnecessary at this time. Comprehensive state control over water use is an appropriate institutional arrangement under conditions of general scarcity and frequent conflict but is less appropriate where water is abundant in many areas and conflicts are few in number.

Another factor suggesting the inappropriateness of the typical water-use permitting approach is its failure to address some of the basic issues leading to water transfer conflict. Permitting programs generally are based on an assumption of public ownership and control of water and incorporate public interest considerations into water-use decisions, but program operation does not necessarily facilitate resolution of conflict between opposing interests. Direct injury to established water uses is prohibited, but transfers of surplus water are likely to be authorized under conditions where all the benefits of transfer accrue to the transferrer. For example, the proposed Virginia Water Withdrawal Act under consideration by the State Water Study Commission provides for prohibition or restriction of new water uses that would produce unacceptable harm but does not provide for compensation when surplus water is taken for use. The act attempts to avoid the water-transfer issue by exempting the proposed Virginia Beach transfer from Lake Gaston, but future proposals for transfer will be subject to the act's provisions. The absence of provisions for sharing the benefits of transfer with the water's area of origin through compensation limits the proposed legislation's usefulness in managing transfer-related conflict. The basic source of opposition will remain unchanged, and challenges to transfer will continue to be exerted through other political processes.

Thus, adoption of the proposed legislation based on the typical water-use permitting approach would result in little improvement in the state's capability to manage this important type of water-use conflict.

The institutional mechanism proposed is a specialized decision-making process designed to serve as a forum for negotiations concerning interjurisdictional water transfer (IWT) conflicts but also to provide, where necessary, a state process for imposing a settlement on the participants to such conflict. An imposed solution would follow a comprehensive review of the case encompassing evaluation of the need for a proposed transfer and the nature and magnitude of adverse economic and environmental impacts of such transfer. The decisionmaking body would have authority either to deny the right to make the proposed transfer or to approve the transfer subject to the payment of specified compensation to the area of the water's origin to provide for sharing of the benefits of transfer. The final disposition would be coordinated with other applicable processes to achieve a simplification of the overlapping decisions necessary under current institutional arrangements. More detailed consideration of the characteristics of the proposed mechanism is presented in the following sections.

ORGANIZATIONAL STRUCTURE: WHO SHOULD DECIDE?

A basic issue of institutional design is the form and structure of the decision-making body responsible for implementing the procedures involved. Since one major function of the new entity will be adjudication of property rights and a general balancing of opposing interests, a judicial form may appear to be an obvious choice. In fact, the current institutional framework contains a judicial process with potential to serve as a basis for the proposed body. A special three-judge court hears appeals from local governmental decisions rejecting requests for interjurisdictional water supply projects. However, the existing judicial process is narrow in focus in that it is limited to reconciliation of local governmental powers and does not encompass final resolution of individual water-rights claims or facilitate compliance with state and federal regulatory processes.

Expansion of the existing judicial mechanism may improve its capacity for resolution of water transfer conflicts, but most states, in developing specialized procedures for water allocation, have created administrative processes for decision-making, with provision for aggrieved persons to appeal decisions to the courts. Administrative

capabilities such as those related to data collection and analysis generally are considered significant advantages of administrative agencies relative to courts with regard to water allocation in situations involving complex disputes.

If the assumption is made that an administrative approach is preferable, the question arises as to whether an existing or a new entity should be given decision-making power. Consideration of governmental economy and prevention of fragmentation of authority suggests use of an existing agency, with the State Water Control Board (SWCB) the logical choice in view of its current water resources management responsibilities. Nevertheless, other factors suggest creation of a new decision-making board. For example, a board to make decisions regarding interregional water transfers must have geographical balance within its membership to mitigate concerns regarding possible bias resulting from residence of the board members. This condition is not necessarily satisfied by SWCB since its members are selected from the state at large.⁵ In addition, general acceptance and confidence in the body may be enhanced by sharing of direct appointive powers between the legislative and executive branches of government, another condition not satisfied by SWCB.⁶

If a new decision-making body were to be created to meet these special requirements, the issue of staffing would require attention. The new board would need the ability to assist with negotiations and to carry out data collection and analysis activities. But creation of a large permanent staff would be costly and of questionable desirability since the board itself would be active only when specific cases arose for decision. The creation of a new standing bureaucracy should be avoided. A possible alternative to an independent, full-time staff would involve utilization of SWCB staff under an arrangement where disruption of SWCB activities could be minimized. Another alternative, perhaps to be used in combination with reliance on SWCB staff, is the use of consultants in areas such as conflict mediation and special data collection and analysis.

JURISDICTION: WHAT CONFLICTS ARE INCLUDED?

The proposed institutional mechanism is intended to be selective in nature; thus, a key issue is the definition of the types of water-use conflicts to be included within the proposed decision process. Review of recent water-use conflicts in Virginia suggests limitation to public water supply development proposals involving

transfer of water across a local political boundary.

Defining jurisdiction in terms of interjurisdictional water movement rather than interbasin water movement offers several advantages. First, negotiation costs can be reduced through use of existing governing bodies as representatives of the areas affected by water transfers. This approach also facilitates coordination of water management concerns with other local issues since units of general purpose government would be involved. A further benefit is that data acquisition would be facilitated since most information relevant to natural resources management is collected and published on the basis of political boundaries.

This approach to defining jurisdiction would exclude application to water-development activities within a single political locality. An extreme case of such impact would involve a transfer between two streams at locations in a single county such that water supply would be substantially decreased in a downstream county. Other water development activities involving on-site consumption rather than transport of water away from its source can also have interjurisdictional impacts due to decreased water availability in natural hydrologic systems that cross political boundaries.

Defining jurisdiction to include such cases would substantially expand its scope compared to the situation where jurisdiction is limited to cases involving artificial conveyance of water across a political boundary. Most uses of water are somewhat consumptive, and interjurisdictional effects are not uncommon. The objective of limiting the scope of the proposed institutional mechanism to major conflict situations suggests that only those transfers involving artificial transport of water across a political boundary be included, with the other types of conflict continuing to be subject to existing legal controls.

THE DECISION PROCESS: HOW ARE DECISIONS MADE?

The proposed mechanism would establish a mandatory approval process for IWTs for public supply purposes. Initiation of any such transfer, or related construction, without the required approval would be unlawful. A potential transferor of water would be required to initiate proceedings prior to taking action to transfer water. In effect, the new mechanism would function as a water-use permitting program for a limited type of development activity.

However, in addition to operating as a traditional permitting process, the proposed institutional mechanism is intended to enhance negotiations as an approach to resolving IWT conflict. The board should be authorized to provide mediation services prior to initiation of proceedings. A locality seeking water supply from outside its boundaries should be authorized to initiate negotiations with one or more areas that may serve as a source of supply, with the board assisting such negotiations.

A negotiated solution would be automatically adopted as the final solution in a proceeding, subject to consideration of state interests. In the event that a negotiated solution proves infeasible, the board would be authorized to initiate regulatory proceedings. Such action would occur where key parties refuse to participate in negotiations or where negotiations become deadlocked in the view of the board.

Board approval of a request for IWT for public supply purposes would constitute the legal right for the applicant to transfer water from a prescribed location at an established rate whenever streamflows or water levels are above a fixed minimum. This minimum level would be established to protect the area of the water's origin from serious adverse effects during periods of low streamflow. As streamflows or water levels fall below the prescribed minimum, the transfer, in accord with a predetermined schedule, would be progressively reduced in magnitude and ultimately terminated until satisfactory conditions were restored.

Any approval granted and actually implemented, after satisfaction of compensation and other requirements, would be effective for an established period of time on the basis of the amortization period for the facilities involved, subject to a prescribed maximum (e.g., 40 years). Requests for renewal would be evaluated on conditions existing at the time of expiration.

Decision Guidelines

Decisions by the board regarding solutions to IWT conflicts should be constrained by legislative guidelines. Such decisions should be consistent with a policy statement declaring IWT to be an acceptable water-supply development strategy where net benefits to the state are created, provided that undue economic or environmental hardship is not imposed on any region of the state as a consequence and that benefits of transfer be shared through compensation.

This policy statement establishes three basic criteria to be met before an IWT proposal can be

approved. First, the transfer must satisfy a net benefit requirement. This determination must be based on an examination of alternative means of balancing water supply and demand within the area proposing IWT, including demand reduction and development of alternative sources of supply. Proposals could also be rejected due to broader issues of state concern. These issues include the impact of the proposed water transfer on local and state water and land-use plans and policies. Also included are interstate issues associated with a particular water transfer. Similarly, federal interests must be included. A primary reason for including interstate and federal issues is to make a decision more acceptable to such parties. While a Virginia regulatory process cannot be designed to ensure the absence of legal challenges arising from non-Virginia parties, incorporation of such interests into the decision process may reduce the possibility of legal conflict.

A second condition for approval of an IWT proposal would be that it not result in undue hardship within the water's area of origin. This evaluation would include consideration of applicable development plans for the area and possible local environmental impacts. Approval should be granted only where conditions can be imposed to protect the interests of the area of the water's origin in a manner judged by the decision-making body to be equitable. A request for transfer authorization should generally be denied where a significant adverse effect on economic or environmental conditions in the area of the water's origin is anticipated that cannot be reasonably remedied by offsetting measures. For example, the expected occurrence of widespread indirect adverse economic impacts would be a basis for rejection of a proposed transfer since measurement of the magnitude of such impact and identification of affected parties would be difficult.

Compensation is the third basic consideration in approving an IWT proposal. Under the proposed procedure, the right to transfer water is conditioned on the willingness of the transferrer to provide compensation as determined by negotiation or by decision of the board. The amount generally should include any damages to the area of origin and a share of the net gain realized by the transferrer. Damages should include injury to individual water users, adverse effects upon the political subdivisions) involved (such as loss in tax base caused by construction of public facilities), and adverse environmental effects. Individual water-rights claimants and political subdivisions authorized to receive

Interjurisdictional water transfer (IWT) would replace the idea of interbasin transfer, and the approval process would be mandatory. Parties presently lacking standing would have a voice in deciding a transfer, thus opening the way to address environmental concerns and reducing the likelihood of court battles.

compensation under the proposed mechanism should be limited to those located within the boundaries of the state. Conflicts involving interstate impacts should be resolved through negotiation between representatives of the state governments of Virginia and the affected state(s). The decision-making body should have authority to specify the form and recipient of compensation for mitigation of environmental losses. For example, provision of funds to the Commission of Game and Inland Fisheries for game and fish enhancement may constitute an appropriate mitigation measure in some cases.

Defining compensation to include a share of the transferor's net gain from the transfer in addition to damages goes beyond the usual requirements under existing law and is intended to increase acceptability of water transfer. The total benefit is measured as the savings associated with the water transfer when compared to the next least-costly water-management strategy. The portion of this benefit to be subjected to the sharing requirement is the quantity remaining after associated costs (such as damages paid to the area of origin and the costs of the proceedings to authorize the transfer) are deducted from the total net benefit.

The appropriate amount and form of compensation to be paid will vary with individual cases. Determinants will include the availability of alternative water supplies for the transferor and the potential demand for water within the area of origin. While compensation could be in the form of a direct transfer of funds, other forms of compensation may be desirable in some cases. For example, the transferor could provide treated water to water users within the area of the transfer's origin. Due to the variation among individual situations, the amount and form of compensation must be established on a case-by-case basis either through negotiation or by decision of the board.

Presentation of Claims

Closely related to the factors to be considered in resolving an application for water-transfer approval are procedures for presentation of claims to the decision-making body. Existing water-rights holders constitute an especially significant class of claimants since such rights are constitutionally protected property interests and serve as the primary basis for individual lawsuits against water transfer activities. All affected water-rights holders should be required upon proper notice to submit their claims to the proposed decision-making body for adjudication, with failure to submit within a prescribed period of time resulting in forfeiture of the claim. Special provisions may be necessary for cases where water users suffer unanticipated damages after initiation of the transfer. Dormant water rights not being exercised at the time a proceeding is held are a special problem due to problems of quantification. Several states adopting conventional administrative permitting systems to replace common-law systems have limited recognition of rights to those exercised by a specified date, with unexercised rights abolished. This approach would facilitate administrative simplicity if adopted for use. If dormant rights were to be given recognition and protection, special procedures would be necessary to assessing such rights. This approach may require re-evaluation of the water rights issue at periodic intervals to allow consideration of claims associated with attempted exercise of dormant rights.

Other parties in addition to individual water-rights claimants should have legal standing within the proposed mechanism to represent beneficiaries of the water both within and outside the water's area of origin. The governing bodies of affected political subdivisions form one additional group that should have standing. Since major water transfers may involve a variety of issues of statewide and even broader concern, other political entities should be authorized to participate in proceedings. This group would include Virginia state agencies, representatives of other states affected by a proposed transfer, and federal agencies. Environmental interests could be represented in several ways. In one approach, all interested parties could be given standing to appear. Alternatively, appropriate state agencies could be viewed as representatives of environmental interests. For example, the SWCB could be given the responsibility of assuring consideration of water quality, and the Commission of Game and Inland Fisheries could provide input concerning fish and wildlife habitat needs. This latter

approach appears to provide for adequate consideration of environmental protection and is suggested by the need for administrative simplicity.

Overcoming Information Inadequacies

The quality of the decisions of the board is dependent on availability of adequate information. The board must be able to make factual determinations concerning the costs of alternative water supply management strategies, the hydrologic effects of proposed IWT, and the economic and environmental impacts.

Although the participants will provide information to support their positions and claims, the board should have the authority and resources to conduct independent data collection and analysis activities. This capability is especially important in view of current information inadequacies and misunderstandings concerning water-supply development.

RELATION OF PROPOSED INSTITUTIONAL MECHANISM TO OTHER DECISION PROCESSES

A primary objective of the proposed institutional mechanism is the reduction of institutional complexity by consolidating multiple decision-making processes currently existing; therefore, the new authority created generally should be superior to conflicting legal requirements already in existence. This supremacy specifically must include existing water rights and regulatory measures imposed by local governments. Water rights are likely to constitute the predominant basis for private lawsuits against water transfers and therefore must be incorporated into the proposed decision-making process and not continued as an independent control exercised through the courts. Similarly, local regulatory measures in the form of land-use controls and direct consent provisions are a significant source of legal challenge to water development and must be consolidated into the proposed measure and not allowed to function independently. The proposed institutional change does not abolish water-rights claims or consideration of local governmental concerns; rather, it provides a specialized administrative process for their evaluation. The new forum provides for joint consideration of all related issues in a comprehensive proceedings as opposed to the present system where separate legal issues are resolved independently.

Since the proposed decision process applies to both surface and groundwater, coordination with the Virginia Groundwater Act of 1973 would be necessary. Such coordination would become

more important should the Groundwater Act be amended to remedy several deficiencies that currently limit its effectiveness.⁸

Although the proposed decision-making process generally is a final determination of the issues with regard to parallel legal controls existing under current state law, decisions resulting from operation of the proposed mechanism would be appealable to the courts under the Virginia Administrative Process Act.⁹ The original appeal could be heard by the circuit court of the jurisdiction where the transfer would originate, or, preferably, by a special court constituted of justices from jurisdictions removed from the affected areas.

CONCLUSION

The proposed institutional mechanism can result in significantly improved IWT conflict management capabilities without major disruption of existing institutions. The proposal addresses the major obstacles to negotiation by establishing procedures for reducing information deficiencies, property rights uncertainty, and negotiation costs. In the event that negotiation is still unsuccessful, a process is established for a state-level body to resolve such conflicts consistent with guidelines based on both efficiency and equity considerations. Although the binding-decision process is intended to serve as an alternative to negotiation where agreements cannot be reached voluntarily, the existence of such a process should create additional incentives for negotiation among parties affected by an IWT proposal.

The major contribution of the proposed institutional mechanism from the perspective of a potential water transferor is increased security. Although all risk cannot be eliminated, the proposed mechanism increases the prospect that payments made will result in exclusive rights to a specific quantity of water and that such rights will be relatively immune from further legal challenge. In addition, the process helps establish the payment levels prior to a transfer being initiated rather than leaving necessary compensation payments to be established by an uncertain process of court challenges.

Interests generally in opposition to IWT also are benefited by the proposed mechanism due to the establishment of clear guidelines as to when IWT is permissible and the provisions for compensation. Water-rights holders will benefit from increased enforceability of rights. Under the existing system, the water right of the landowner is generally considered to be a property right, but the usufructuary nature of the right results in the right serving primarily as

a rule of liability which protects the holder only when he is adversely affected by another party's actions. The right is not likely to require compensation to its holder when another party such as a public supplier takes water without adverse effect by means of direct withdrawal of surplus stream flow or withdrawal of impounded floodwater.

Environmental interests and local governments also are benefited by the proposed mechanism. Environmental groups have a general goal of maintaining minimum flows adequate for protection of fish and wildlife and other instream water uses. To the extent that existing institutions prevent removal of water from streams, they advance this goal. However, the riparian doctrine, the principal constraint at present, does not assure adequate consideration of instream water uses during the water allocation process unless such uses are associated with individual riparian landowner interests. Parties interested in protection of instream water uses who are not riparian landowners are not likely to be legally recognized as participants in judicial proceedings held under the riparian doctrine. In contrast to this possible lack of legal standing under the riparian doctrine, the proposed allocation mechanism would guarantee representation of environmental interests. In addition, compensation payments required under the proposal enhance programs or other mitigation measures necessary to offset adverse effects on instream water uses.

Local governments representing the general population in an area also may lack standing to seek compensation under the current system. The proposed changes would provide payments that could add to the tax base of the community. In addition, the procedure is designed to deny transfers that would have negative effects on economic growth in a region - an argument that may not be heeded under current review procedures.

Proposals for institutional change generally encounter significant opposition and often undergo constitutional challenge due to their potential impact on property rights. Although substantial legal precedent exists to support the constitutional validity of the type of measure proposed here, significant political opposition can nevertheless be expected to confront any suggested change. Institutional change to facilitate resolution of IWT conflict is likely to be seen as a redistribution of wealth favoring urban areas over rural areas and developmental interests over environmental interests. But the capability of existing water institutions to prevent transfer and

protect environmental interests has been shown to be uncertain: the proposed mechanism may offer improved standing for interests opposing transfer.

The proposed institutional mechanism will not ensure approval of any particular transfer proposal and is unlikely to result in a significant increase in the number of transfers taking place. Although beneficial transfers will be facilitated, undesirable transfers will encounter a surer and more expeditious rejection. The major focus of the proposed change is improvement in the quality of decision making and reduction in the waste of time and resources associated with current institutions.

FOOTNOTES

1. For a discussion of Virginia's water law as related to water supply development see William E. Cox and Leonard A. Shabman, *Institutional Issues Affecting Water Supply Development: Illustrations from South-eastern Virginia* (VWRRC Bulletin 138), Virginia Water Resources Research Center, Blacksburg, Va., 1983.
2. Virginia Acts of Assembly, HJR 236, 1977.
3. *Va. Code Ann.* secs. 9-145.5 *et seq.* (Supp.1984).
4. *Va. Code Ann. secs. 15.1-37.1 et seq.* (Supp. 1981).
5. [Id. sec. 62.1114.9](#) (1982).
6. [Id. secs. 62.1-44.8](#)
7. For judicial interpretation of the validity of such actions, see *Village of Tequesta v Jupiter Inlet Corp.*, 371, So. 2d 663 (Fla. 1979), *cert. denied* 444 U.S. 965 (1979); *Williams v City of Wichita*, 374 p. 2d 578 (Kan. 1962); *Southwest Engineering Co. v Ernst*, 291 p. 2d 764 (Ariz. 1955).
8. See Cox and Shabman, *supra* n. 1.
9. Virginia Administrative Process Act, *Va. Code Ann.* sec. 9-6.14:1 *et seq.* (1978 and Supp. 1982).
10. See "The Constitutional Sanctity of a Property Interest in a Riparian Right," *Washington University Law Quarterly* 1969: 327-338; Scurlock, John, 1953. "Constitutionality of Water Rights Regulation," *Kansas Law Review* 1:298-318; Ellis, James D., 1969. "Modification of the Riparian Theory and Due Process in Missouri," *Missouri Law Review* 562-574; Mattson, Jon, 1969. "Water Rights and the Constitutionality of the 1955 South Dakota Water Act," *South Dakota Law Review* 11:374-385; Grant, Douglas L., 1979. "The Idaho Water Plan: Two Threshold Constitutional Problems and Suggested Solutions," *Idaho Law Review* 15:443-507.