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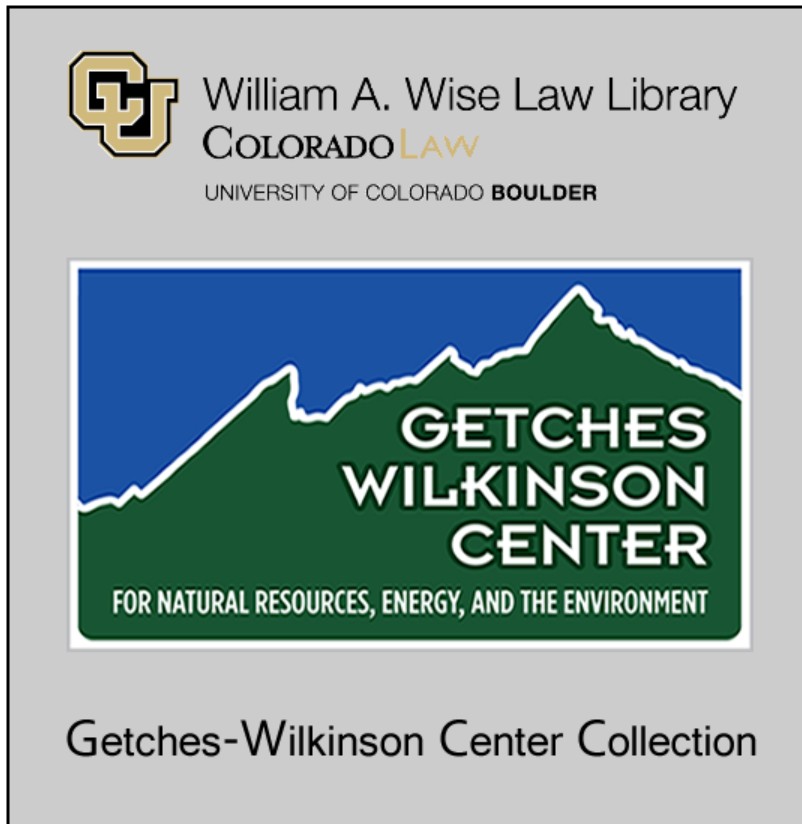
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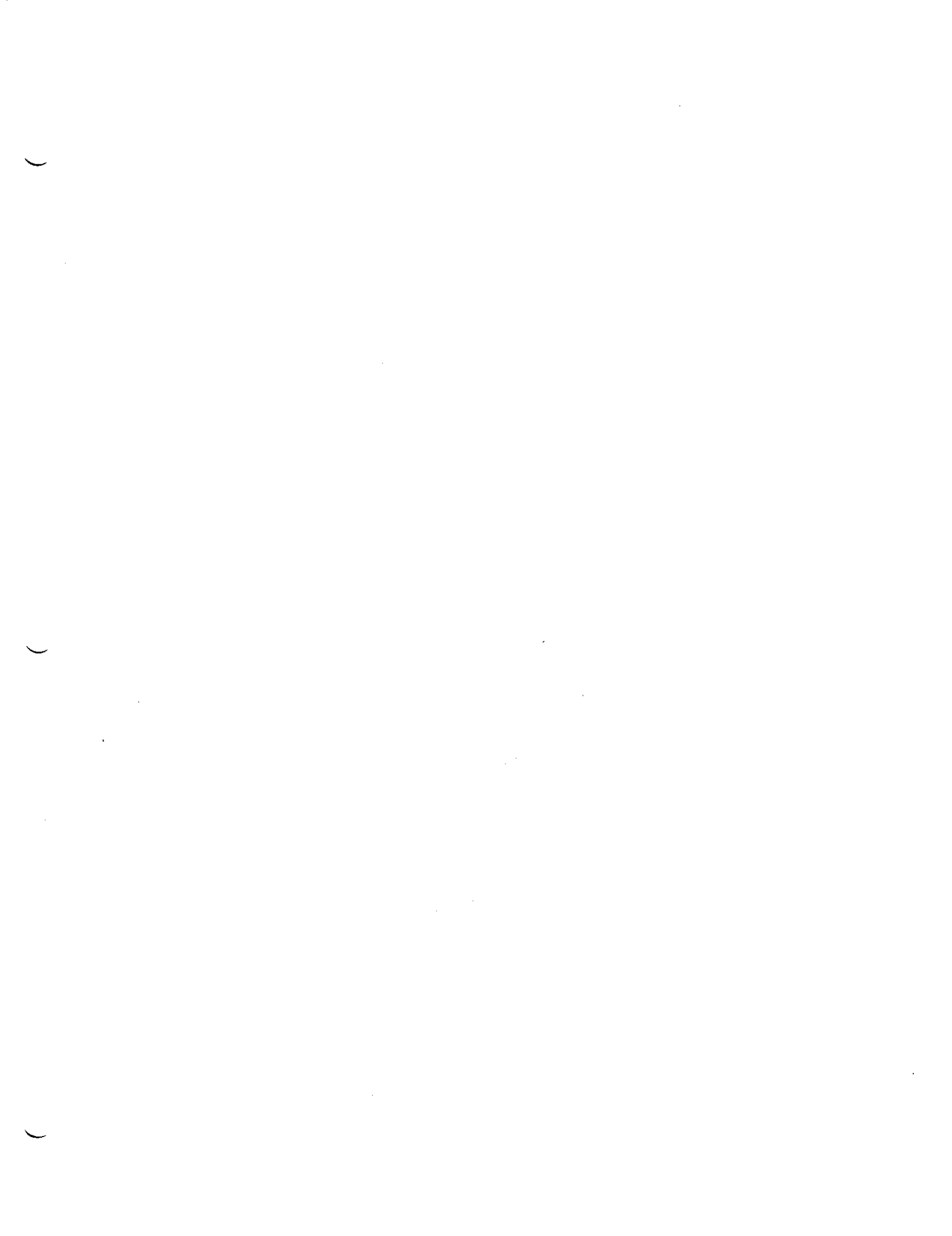
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WATER CONSERVATION THROUGH INTEGRATED  
BASINWIDE IMPLEMENTATION

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## I. INTRODUCTION

A. When people are looking for ways of improving water use efficiency in the West, a finger is often pointed at irrigated agriculture as holding the most potential.

1. Crop irrigation accounts for nearly 90% of all water consumed in the western United States.
2. On the average, nearly one-fourth of the agricultural diversions are lost in leaky conveyance ditches, while crops utilize only 53% of the remainder that reaches the field.

B. Fingers that point to improved irrigation efficiency as the panacea for water shortages risk getting caught in the pincers of economic and hydrologic realities.

1. A vast majority of excess irrigation diversions return to the stream or ground water where they can be reused by others.
  - a. In some areas, these return flows from ditch seepage and overapplication during the spring and early summer actually enhance a region's capacity to support irrigation in the dry late-summer season.
  - b. Downstream irrigators who rely upon these late return flows would hardly consider the upstream practices inefficient or wasteful.
2. Water applied in excess of the crops' consumptive demands cannot be deemed wasteful where such overapplication is necessary in order to prevent

salt from building up in the soil.

3. Even that amount of water which is evaporatively lost during the irrigation process may not be completely wasted - studies indicate that such losses can result in cooler temperatures and higher humidity near the field surface, which in turn reduces consumptive requirements of the crop.

## II. THE MULTIPLE BENEFITS OF IMPROVING IRRIGATION EFFICIENCY

A. The preceding facts do not negate the importance or need for reducing unnecessarily large applications of irrigation water in many areas throughout the West.

1. In some instances (such as in the Imperial Valley of California and other closed basins), reducing the amount of return flows can actually make significantly more water available for alternative uses.
2. More commonly in basins of the western states, improvements in irrigation efficiency would carry a number of secondary benefits, listed below, to the overall stream system and downstream water users.

### B. Erosion Control.

1. "Erosion is threatening the continued productivity of more than half of all the irrigated land in the West. Part of this is caused by the attempt to grow crops on land not suited to crops....But most of this damage results from misuse of irrigation water." [Bosworth and Foster, Approved Practices in

Soil Conservation, p. 379-380 (1982)]

2. Eroded sediment carried back to the stream in excessive return flows also diminishes water quality.

C. Salinity and Chemical Pollutant Mitigation.

1. Excessive irrigation applications can leach fertilizer and pesticide components from the field and carry them into water supplies.
2. In some regions of the West, excessive return flows leach salts from naturally saline strata and add to the problem of high salt content in water supplies.
3. Excessive applications, teamed with poor drainage, can cause marshy conditions with subsequent evaporation leaving destructive salt deposits in the topsoil.

D. Reduced Operating Costs.

1. Improved irrigation efficiency can result in lower operating costs to the farmer implementing the improvements.
2. Fertilizer, pesticide, labor, and pumping expenses are often reduced when modern techniques are implemented to reduce water application needs.

E. Control of Interstate Waters.

1. A state that is fighting with other states for control of interstate waters can also benefit from implementing a program for water use efficiency.
2. Recent United States Supreme Court decisions have established that a particular state's right to use

and control interstate waters is strongly influenced by that state's commitment to water conservation and efficiency. [Sporhase v. Nebraska, 458 U.S. 941, 953-957 (1982); Colorado v. New Mexico, 459 U.S. 176, 184-186 (1982) and 104 S. Ct. 2433, 2440 (1984). See also, Tarlock, "The Law of Equitable Apportionment Revisited, Updated, and Restated," 56 Colo. L. Rev. 381 (1985).]

F. Instream Flow Augmentation.

1. The benefits of promoting instream flows through reductions in irrigation diversions are numerous.
  - a. Improved fisheries and associated recreational activities.
  - b. Other recreation and enjoyment derived from free-flowing waters.
  - c. Dilution of pollutants.
  - d. Increased hydroelectricity production.
  - e. Maintenance of viable stream channels and riparian habitat.
2. Such benefits can result from improved irrigation efficiency even in those areas where the overapplied diversions historically returned to the stream system. Rather than spending time percolating underground through the basin or running down surface channels before reemerging in the natural stream, the flow would remain in the intervening natural bed for instream uses.



### III. THE NEED FOR BASINWIDE STRATEGIES

- A. Since the incremental benefits of improved water use efficiency accrue throughout the watershed, and since the need for efficiency can only be assessed in relationship to basinwide hydrology and other regional considerations, a program for conserving water must be comprehensively addressed on a basinwide basis.
- B. A comprehensive state program for improving water use efficiency associated with senior rights should include the following elements.
  - 1. A system of positive incentives (i.e. tax breaks, subsidies, technical assistance) to encourage improvements in irrigation techniques.
  - 2. Mandatory regulations to enforce against the wasting of water.
  - 3. Legislation to facilitate the transfer and marketing of senior water rights to new uses, and to enable the marketing of salvaged water.
  - 4. Pricing of water to encourage voluntary conservation and to raise funds for subsidies and other costs of the program.
- C. These components are incorporated into a model state program in Part IV below.

### IV. A PROPOSAL FOR A MODEL PROGRAM

- A. State legislatures should establish a comprehensive program to promote more efficient use of senior rights

where the benefits of such improvements on a basinwide basis outweigh the negative effects.

B. Component 1: Establish a State Office of Water Conservation to spearhead the program.

1. Composition of the Office.

- a. A director and small staff located in the state capitol.
- b. Local Water Conservation Engineers assigned to each of the basins in which the program is being implemented.
- c. An appointed board to set policy, to provide oversight, and to hear appeals.

2. Primary functions of the Office.

- a. To sponsor research and educational activities on opportunities for water conservation.
- b. To undertake a basin-by-basin analysis of the benefits and costs of improving water use efficiency. (The Local Water Conservation Engineers would be the primary investigators in these efforts.)
- c. To provide technical assistance for improving irrigation efficiency, through the Local Water Conservation Engineers.
- d. To determine salvage credits. (See Component 2 below.)
- e. To implement and enforce the waste forfeiture procedures. (See Component 3 below.)
- f. To administer grants and subsidies for upgrading

inefficient water use systems, and to administer the users fee program. (See Component 4 below.)

C. Component 2: Allow for marketing of that portion of a water right that was historically irretrievably lost but, due to irrigation system improvements, is able to be salvaged.

1. Purpose - To provide economic incentive to senior irrigators to invest in system improvements. Also, provides an alternative for new users to obtain water supplies in overappropriated areas.
2. Procedural elements of the program.
  - a. A senior irrigator who wishes to salvage files an application with the Local Water Conservation Engineer (LWCE) prior to making system improvements.
  - b. The burden of proof is on the applicant to support the amount of irretrievable loss that is proposed for salvage.
  - c. Interested persons receive notice through publication or some other form consistent with the state's water notice procedures. Such persons may submit written concerns and data regarding any objections they may have regarding the application.
  - d. The LWCE makes a field survey of the existing operation and analyzes the proposed salvage program; recommendation follows to the Office of Water Conservation which issues a preliminary

finding regarding the amount of the allowable salvage credit.

- e. An opportunity for hearing is provided to the applicant or objectors in order to protest the preliminary finding regarding the amount of the salvage credit.
- f. The Office of Water Conservation issues a final order granting a conditional salvage right to the applicant.
- g. The applicant has a designated period of time in which to complete the proposed irrigation system improvements and thereby salvage the irretrievable loss.
- h. Upon completion of the irrigation improvements and confirmation by the LWCE, the applicant receives an absolute salvage right and may use or market the additional waters.

D. Component 3: Implement a procedure for forfeiting water rights in excess of reasonable needs.

- 1. Purpose - to phase out excessive use of water where technically and economically feasible.
- 2. Procedural elements of the program.
  - a. Legislature modifies the definition of "beneficial use" and the state forfeiture statute to explicitly call for the elimination of wasteful water use in accordance with the following procedures.
  - b. Forfeiture of a portion of a water right is

initiated by the Local Water Conservation Engineer after three years of "non-beneficial use" in a basin in which the wasteful application of water is detrimental to other users. (Such a determination should be made only after the LWCE has gained a thorough understanding of basinwide water use, return flow timing, farm economics, water quality problems, instream flow needs, and other factors involved in a comprehensive assessment of the costs and benefits of improved efficiency.)

- c. The LWCE gives notice to the water right holder of the state's intent to file for forfeiture of the holder's excessive diversion.
- d. A two year waiting period begins in which the water right holder may attempt to salvage the irretrievable loss portion, if any, of the water right pursuant to the procedures in Component 2 above.
- e. Following the two year period, the Office of Water Conservation issues its preliminary finding regarding the amount of the water right that is to be forfeited.
- f. An opportunity for a hearing is provided to the water right holder to protest the proposed forfeiture. The burden of persuasion is on the Office of Water Conservation to show the amount of the right that has been non-beneficially used.

- g. In order to protect irrigators from financial hardship, "non-beneficial use" should be defined by the legislature as reflecting the irrigator's ability to afford improved efficiency. In other words, irrigators should not be required to improve their systems beyond their economic reach.
  - h. The Office of Water Conservation issues its final order regarding the amount, if any, of the water right that is deemed forfeited.
- E. Component 5: Help increase the "economic reach" of irrigators who are using antiquated systems.
- 1. Create tax incentives for capital improvements to irrigation systems.
  - 2. Provide subsidies and low interest loans to irrigator wishing to modernize as well as to those who are faced with forfeiture of a portion of their water right pursuant to Component 4 above.
  - 3. Funding for this program could be raised through a users fee imposed on diversions for municipal, industrial, and other uses. This fundraising device would have the secondary positive effect of encouraging conservation in order to reduce water expenses of the end users.