

**COLORADO STATE ENGINEER’S
STATEMENT OF BASIS AND PURPOSE
FOR THE PROPOSED IRRIGATION IMPROVEMENT RULES
IN THE ARKANSAS RIVER BASIN IN COLORADO**

State Engineer Dick Wolfe filed the Compact Rules Governing Improvements to Surface Water Irrigation Systems in Arkansas River Basin in Colorado (“Irrigation Improvement Rules” or “Rules”) in the Division 2 Water Court on September 30, 2009. This Statement discusses the State Engineer’s authority to enact rules that regulate surface water irrigation system improvements in Water Division 2; explains the need for the Irrigation Improvement Rules and the public process for developing them; and summarizes how they will be implemented.¹

I. AUTHORITY FOR THE IRRIGATION IMPROVEMENT RULES

The Irrigation Improvement Rules are designed to allow improvements to the efficiency of irrigation systems in the Arkansas River Basin while ensuring compliance with the Arkansas River Compact (“Compact”), § 37-69-101, C.R.S. (2009). The State Engineer adopted the Rules pursuant to the Compact rule-making authority. C.R.S. § 37-80-104 provides:

Compact requirements – state engineer’s duties. The state engineer shall make and enforce such regulations with respect to deliveries of water as will enable the state of Colorado to meet its compact commitments. In those cases where the compact is deficient in establishing standards for administration within Colorado to provide for meeting its terms, the state engineer shall make such regulations as will be legal and equitable to regulate distribution among the appropriators within Colorado obligated to curtail diversions to meet compact commitments, so as to restore

¹ Although no statement of basis and purpose is legally required, the State’s team has prepared this accompanying Statement of Basis and Purpose to provide background on the Rules. Compact rules are promulgated following the same standards and procedures for rules enacted under the State Engineer’s water rule authority, see C.R.S. § 37-92-501, and the Colorado Administrative Procedures Act does not apply. Kuiper v. Gould, 583 P.2d 910, 913 (1978); see also Simpson v. Bijou Irrigation Dist., 69 P.3d. 50, 55 (Colo. 2003). In the event of any conflict between this document and the text of the Rules, the text of the Rules supersedes.

lawful use conditions as they were before the effective date of the compact insofar as possible.

§ 37-80-104, C.R.S (2009).

As discussed more fully in Part II (A) and (B) below, the State Engineer has determined that improvements to surface water irrigation systems, such as sprinklers and drip systems that replace flood and furrow irrigation, or canal-lining that reduces seepage, have the potential to materially deplete the usable waters of the Arkansas River in violation of the Compact. See Rule 6(E). Article IV-D of the Compact provides that post-Compact water development in Colorado, including the “improved or prolonged functioning of existing works,” is not to materially deplete usable Stateline flow. The State Engineer has determined that Compact rules are necessary to enforce Article IV-D, because the Compact itself does not establish standards for administration of improvements to surface water irrigation systems to ensure Compact compliance. See Rule 6(F). These findings establish the prerequisites for an exercise of the State Engineer’s authority under § 37-80-104.

In addition, the State Engineer has been guided by the principles set out in § 37-92-501(2) for exercise of the rule-making power. In particular, the Irrigation Improvement Rules serve the important objective of “optimum use of water consistent with preservation of the priority system of water rights.” See § 37-92-501(2)(e); see also Simpson v. Bijou, 69 P.3d at 69. These Rules serve optimum use by allowing water users to make investments in irrigation efficiency improvements with confidence that they will be in compliance with Compact obligations. Rule 10 serves optimum use by providing the mechanism for water users, or an entity acting on their behalf, to submit a Compact Compliance Plan. Such plans allow use of other water sources to maintain the historical seepage and return flows from the subject water rights, instead of reducing the diversion or consumption of the subject water rights.

II. THE RULES ARE NECESSARY TO ENSURE COMPACT COMPLIANCE

A. Irrigation Improvements are subject to the Compact's limit on future developments in Colorado.

Colorado and Kansas entered into the Compact in 1948 to apportion the waters of the Arkansas River and the benefits arising from the construction, operation, and maintenance of John Martin Reservoir. Compact, Article I. Article IV-D of the Compact governs future developments in the Arkansas River basin (Basin) in Colorado. It provides that:

This Compact is not intended to impede or prevent future beneficial development of the Arkansas River basin in Colorado and Kansas by Federal or State agencies, by private enterprise, or by combinations thereof, which may involve construction of dams, reservoirs, and other works for the purpose of water utilization and control, as well as the improved or prolonged functioning of existing works: *Provided, that the waters of the Arkansas River, as defined in Article III, shall not be materially depleted in usable quantity or availability to the water users in Colorado and Kansas under this Compact by such future development or construction.*

Compact, Article IV-D (emphasis added). The State of Colorado and each person or entity using water in the Basin are subject to this rule. Compact, Article VII-A.

Kansas sued Colorado for violations of the Compact in 1985. Colorado was found to have violated Article IV-D by allowing post-Compact well pumping. Kansas v. Colorado (No. 105, Original), 514 U.S. 673 (1995). In the first of five reports to the United States Supreme Court, Special Master Littleworth examined the meaning and scope of Article IV-D. Special Master Littleworth's First Report (July 1994), at 101, 107-08. He found that it protects the usable flows of the river as of the time of the Compact (including return flows from existing irrigation uses) from material depletion caused by any increased consumptive use in Colorado, including depletions caused by post-compact wells and the replacement of centrifugal with turbine pumps. *Id.* at 107-08. The Supreme Court affirmed this interpretation. Kansas v. Colorado, 514 U.S. 673, 691 (1995).

In that case, the States also disagreed on the amount of pumping allowed from the wells that were already in place as of the date of the Compact. The Court focused on the phrase “improved or prolonged functioning of existing works” in Article IV-D. *Id.* at 690. It held that “the clear language of Article IV-D” answered that question: “Improved and increased pumping by existing wells clearly falls within Article IV-D’s prohibition against ‘improved or prolonged functioning of existing works,’ if such action results in ‘material depletions in usable’ river flows.” *Id.* at 690.

Following the same rationale, improvements to the surface water irrigation systems that existed at the time of the Compact also fit the phrase “improved or prolonged functioning of existing works.” Like the groundwater wells that were the subject of Kansas v. Colorado, they are subject to the limits of Article IV-D and need to be addressed. *Id.*

B. Irrigation Improvements have the potential to cause material depletions.

Increases in irrigation efficiency provide many benefits for Colorado water users, as did the technological advances in well pumping in the 1950s. They save money by reducing the need for hired labor, and they improve water quality by reducing irrigation runoff and seepage. The better water quality may in turn result in improved crop yields within the region.

Moreover, increasing irrigation efficiency has for years been cited as a promising way to address water scarcity problems in Colorado and throughout the Western United States. See, e.g., David H. Getches, *Meeting Colorado’s Water Requirements: An Overview of the Issues*, in *TRADITION, INNOVATION AND CONFLICT: PERSPECTIVES ON COLORADO WATER LAW* at 11 (MacDonnell, ed.) (1986) (stating that “there should be great opportunities for finding supplies of water through increased agricultural efficiency”). Scholars and policymakers continuously emphasize that irrigation constitutes 86% of water use in Colorado, and assert that wasteful

irrigation methods can be tapped to solve water scarcity. Most of these scholars acknowledge the fact that a portion of any overapplied agricultural water returns to the stream and has already been appropriated by users below, so is not available to supply other uses. See, e.g. Getches, *supra*, at 11. “One user’s inefficiency is often another user’s water supply,” especially in an overappropriated basin like the Arkansas. See, e.g., Frank A. Ward and Manuel Pulido-Velasquez, “Water Conservation in Irrigation Can Increase Water Use,” in *Proceedings of the National Academy of Sciences*, Vol. 105, No. 47 (Nov. 25, 2008) 18215 at 18216.

The State Engineer supports efforts to increase irrigation efficiency in the Arkansas River Basin in Colorado as long as they do not violate Article IV-D of the Compact. The irrigation return flows from Colorado farms that were being used in Kansas in 1948 cannot now be consumed by improved irrigation practices in Colorado. With the Irrigation Improvement Rules in place, the State Engineer can provide the oversight necessary to allow Colorado water users to continue to improve the efficiency of surface water irrigation systems with confidence that they will be in compliance with the Compact.

A variety of factors affect whether a change in irrigation method will have an impact on historical seepage and return flows. Perhaps the most important factor is the sufficiency of the water supply to the field using the unimproved irrigation system. On a water-short farm, the water supply available to the farm does not provide a sufficient amount of water to meet the crop demand on all of the acres decreed for irrigation. In water short systems, when a more efficient method of irrigation is used, a greater portion of water applied will be delivered to the crop root zone and can be consumed by crop evapotranspiration. Certain improvements in efficiency on water-short systems will result in more water being made available for crop evapotranspiration, increasing the crop consumptive use of water applied for irrigation and reducing historical

seepage and return flows. This fact is well-established and is supported by a broad array of studies and research. See, e.g., Ward and Pulido-Velasquez, *supra*, at 18216 (“[I]rrigation technologies that apply water at optimal times and locations in the plant root zone increase crop consumptive use of water and crop yield as irrigation efficiency increases”); Chris Perry, “Efficient Irrigation; Inefficient Communication; Flawed Recommendations,” in *Irrigation and Drainage*, Vol. 56 (2007) 367 at 369 (“an increase in efficiency frequently means that consumption by crops is increased because the service more precisely and uniformly matches the water needs of the crop”).

In 2003, the United States Department of Agriculture’s Natural Resources Conservation Service (NRCS) began providing cost-sharing funds to farmers in the Arkansas Basin to purchase center pivot irrigation systems to improve their irrigation systems. As a result, there has been a recent rise in the number and type of irrigation system improvements in the Basin. For example, a review of aerial photographs taken in 1998 versus 2008 demonstrates that approximately 6,100 acres on ditches along the Arkansas River mainstem below Pueblo Reservoir have installed sprinkler systems on fields that previously were flood irrigated with surface water. See Study by Division 2 Office (April, 2009).

Beginning in 2006, Kansas officials informed the State Engineer and various Colorado representatives that they are concerned that the increased crop consumption allowed by these irrigation improvements will materially deplete Stateline flows in violation of the Compact. In response, the State Engineer’s Office reviewed the extent of such irrigation system improvements in Division 2 and also conducted a series of computer model runs to determine the potential impact of various irrigation system improvements in Colorado on Stateline flows using the H-I Model, the tool approved by the United States Supreme Court for determining Compact

compliance for ground water pumping.² The Engineers concluded that the irrigation system improvements covered by the Rules have the potential to materially deplete usable Stateline flows in violation of Article IV-D of the Compact, and should be regulated.

III. PUBLIC DEVELOPMENT PROCESS FOR THE IRRIGATION IMPROVEMENT RULES

A first draft of “Efficiency Rules” was circulated for public comment in late 2007 under the previous Colorado State Engineer. Because of opposition at the time, the present State Engineer, Dick Wolfe, who was appointed to office on November 26, 2007, began meeting with the various water user groups concerned about that draft, and decided to convene a public Advisory Committee to address the concerns and find solutions. On May 12, 2008, the State Engineer issued an Order Establishing Advisory Committee for Arkansas River Compact Rules to Govern Improvements to Surface Water Irrigation Systems in the Arkansas River Basin. To ensure that the Advisory Committee included a wide representation of interests and expertise, the State Engineer invited 20 different organizations, including water districts, water user associations, State and federal agencies, and counties to nominate a member, and added Colorado’s three Arkansas River Compact Administration representatives and several other water users, engineers and attorneys who practice in Division 2. There were a total of 32 members and 5 alternates on the Advisory Committee. See **Exhibit A** (membership list). Its tasks were:

1. To provide advice and recommendations to the State Engineer on rules and regulations to comply with the terms of Article IV-D

² The measure of compliance is a moving 10 year total of the annual depletions or accretions to usable Stateline flow computed using the H-I Model. See 543 U.S. 86, 103 (2004); see also, Special Master Littleworth’s Fifth and Final Report (January 2008), Volume II, at page 3-4, Section I (B)(1), entered as final judgment and decree, 129 S.Ct. 1294 (March 9, 2009). The H-I Model may only be changed by agreement of the States or pursuant to the Dispute Resolution Procedure contained in Appendix H of that decree. *Id.* at page 5, Section I (B)(4).

of the Compact with regard to improvements to surface water irrigation systems in the Arkansas River basin in Colorado, including the following:

- a. Methods to evaluate improvements to surface water irrigation systems in the Arkansas River basin in Colorado to comply with the terms of Article IV-D of the Compact;
 - b. Terms and conditions to prevent or replace depletions resulting from improvements to surface water irrigation systems in the Arkansas River basin in Colorado to comply with the terms of Article IV-D of the Compact.
2. To provide recommendations to the State Engineer on ways to achieve benefits from improving surface water irrigation systems in the Arkansas River basin, including but not limited to water quality benefits and labor-saving benefits, while still complying with the terms of Article IV-D of the Compact with regard to improvements to surface water irrigation systems in the Arkansas River basin in Colorado.

The Advisory Committee met five times in 2008 (July 9, July 30, September 19, Oct 22, Nov 13) and four times in 2009 (Feb 24, April 16 (by phone), June 22, and September 21). Each meeting resulted in significant substantive changes to the “Working Draft” of the Rules, which were sent back to the Committee members for their review and comment prior to the next meeting. Some of the more notable changes initiated by the Committee include: the retrospective aspect of the rules was narrowed to apply only to sprinklers and drip systems within the H-I Model Domain; the definition of “improvements” was significantly refined; the Irrigation System Analysis Model (discussed below) was developed to replace the need for applicants to pay for individualized engineering reports; the Notification List for electronic notice of all actions taken under the Rules was created; the administrative appeal procedures were detailed; the concept for Rule 10 Compact Compliance Plans was developed; and the Rule 11 General Permits were initiated.

In addition, the two subcommittees discussed below accomplished considerable work during the 15 month period:

A. The Engineering Subcommittee and the Irrigation System Analysis Model (ISAM):

A subcommittee of twelve (including ten engineers) began working in July 2008 to respond to the predominant concern that the State Engineer should not require each applicant to obtain an individualized engineering report. Water users felt that requiring each applicant to hire an engineer would be cost-prohibitive and impractical, and wanted an inexpensive way to evaluate applications. In response, the Division Engineer's Office developed the Irrigation System Analysis Model (ISAM) in conjunction with the Engineering Subcommittee. It is a spreadsheet tool that compares the water consumption under recent hydrologic conditions using the surface water irrigation system without the irrigation efficiency improvement with the consumption under the same conditions using the same system with the improvement. The Subcommittee met in July, September, October and November of 2008 and in February and April of 2009, to review and improve the ISAM.

The only information the applicant needs to provide to run the ISAM is how many acres the system irrigates; any change in acreage due to the improvement (such as drying up corners when converting from flood to sprinkler irrigation); the surface water right or rights used on that acreage, or the number of ditch shares if applicable; and whether there is supplemental irrigation from a well. By incorporating assumptions about canal and lateral losses, soil moisture accounting, etc. (see Rule 5.A.8 for the full list of assumptions imported from the H-I Model), the ISAM allows for a cost-effective evaluation of proposed improvements which is consistent with the H-I Model.

B. The Solutions Subcommittee and the Rule 10 Compact Compliance Plans:

A second subcommittee was selected by the Advisory Committee at its November 2008 meeting to find efficient and inexpensive ways to assist farmers with compliance under the

Rules. It focused on streamlining the procedures for filing applications, finding opportunities to ease the expense of compliance, and finding sources of water to be used for maintenance flows when an improvement is found to cause a reduction in historic return flows. The Solutions Subcommittee met on December 16, 2008, January 13, 2009, February 3, 2009, and February 6, 2009, and then submitted written recommendations to the Advisory Committee. **See Exhibit B, attached.** Many of these recommendations have already been implemented, and the State and Division Engineer's Offices will continue to follow these recommendations when implementing the Rules.

The Colorado Water Conservation Board (CWCB) immediately pursued funding to jumpstart these efforts. The CWCB's assistance is consistent with its statutory missions to promote efficient water use and ensure Compact compliance C.R.S. § 37-60-106 (1)(i) and (r) (2009). In November of 2008, the CWCB voted to ask the Colorado legislature to appropriate \$250,000 out of the CWCB's Construction Fund for use in FY 2010 and beyond "to provide technical and financial assistance in addressing the effects of increasing agricultural water use efficiency in the Arkansas river basin, as established by the Colorado state engineer's promulgated rules, and formulate and implement cost-effective means to comply with the rules and specific measures to prevent potential compact violations." Senate Bill 09-125.

The CWCB has begun spending these funds to carry out Recommendation A and several other recommendations of the Solutions Subcommittee (see Exhibit B) in a contract with the Lower Arkansas Valley Water Conservancy District (Lower Ark District). The Lower Ark District will serve as a liaison between the water users and the Division Engineer's Office for Rules compliance. The Lower Ark District already hired Leonard Rice Engineers, Inc., in early 2009 to review the ISAM and begin developing Rule 10 Compact Compliance Plans. This role

dovetails with the Lower Ark District’s mission to promote and protect agriculture in the Lower Arkansas Valley in Colorado, including by finding conservation solutions, promoting drip irrigation, and improving water quality.

IV. OVERVIEW OF THE RULES AND MECHANISMS FOR COMPLIANCE

A. Scope of the Rules; Definition of “Improvement”:

The scope of the Rules is set out in Rule 4. The Rules mainly apply prospectively, i.e., to improvements installed after the effective date of the Rules. However, they also apply retrospectively to one category of existing improvements which the Engineers found has the potential to violate the Compact. Namely, sprinklers and drip systems installed within the H-I Model Domain after October 1, 1999 must receive approval to continue being used after the Rules become effective. Rule 4.A.

The Rules apply to the full geographic area that is subject to the Compact, which means all of Water Division 2 except for the Dry Cimarron River basin that flows into New Mexico. Rule 4.B. The Rules are limited to improvements to surface water systems because improvements to groundwater systems are already addressed through the 1996 Use Rules. Rule 4.D. They do not apply to lawn irrigation or to irrigation of less than one acre. Rule 5.A.7 and 4.E. In addition, because the Bureau of Reclamation already reviews surface water irrigation in the Purgatoire River Water Conservation District (PRWCD) every ten years under the Trinidad Project Operating Principles, for the effect, if any, the operation of the Trinidad Project has had on other Colorado and Kansas water users, the Rules generally do not apply to the improvements within the PRWCD that are already being regulated through that process. Rule 4.F.

The key term “improvement” is defined in Rule 5.A.6. It includes certain methods of reducing seepage from canals and off-farm laterals, adding ponds for short-term storage of

surface water, replacing flood irrigation with sprinkler or drip systems, and certain upgrades to existing sprinkler systems. This definition was refined through the Advisory Committee process. Most notably, the Committee requested removal of gated pipe and certain other on-farm ditch structures from the definition. After study, the Engineers agreed to this change on the basis that improvements to on-farm ditches and use of gated pipe do not currently contribute to depletions of usable Stateline flow. The Committee also made several revisions to the language about upgrading sprinkler systems. Under the final definition, when a side roll sprinkler system is replaced with a center pivot system, and when the older impact-type sprinkler nozzles on either type of system (side roll or center pivot) are replaced with spray nozzles (whether on drops or not), the Rules apply and Division Engineer approval is required.

Rule 7 is the central rule which requires that covered surface water irrigation system improvements must be approved by the Division Engineer. The consequences of failure to receive approval include curtailment of the subject water right. The Advisory Committee process resulted in a revision to this rule to clarify that the Division Engineer will curtail a water right for failure to comply with the Rules only to the extent that the water being diverted is used in connection with the improvement at issue. Rule 7.C.

B. Three Paths to Division Engineer Approval of Covered Improvements:

The Rules are designed to provide irrigators with options and flexibility to comply with the Rules. If a surface water irrigation system improvement falls within the scope of the Rules and must be approved, the farmer has three potential ways to achieve compliance: under a Rule 8 individual application, a Rule 10 Compact Compliance Plan, or a Rule 11 General Permit.

1. Rule 8 Applications:

Rule 8 sets out the procedures for an application that is filed for a surface water system improvement. Rule 8 approvals cannot involve the use of any water source other than the subject water right (because use of another water source for maintenance flows would qualify it as a Rule 10 application). Rule 8 was changed early in the review process to remove the requirement that each Applicant hire a licensed engineer to prepare an engineering report on each improvement. It now provides that the Applicant may submit any additional information or data he wishes to have considered in the Division Engineer's review, but only the few pieces of information necessary for running the ISAM (see above) are required from each Applicant.

2. Rule 10 Plans:

Rule 10, the second option, is the Compact Compliance Plan that evolved out of the Advisory Committee process. It differs from a Rule 8 application in two key ways. First, it allows groups of farmers to join together and file one application. Addressing improvements in groups rather than individually provides financial and administrative benefits for both the irrigators and the Engineers.

Second, Rule 10 Plans can include use of other water than the subject water rights to maintain the historical seepage and return flows. "Subject water right" means the water right that is put to use via the irrigation systems being improved. Under Rule 8, the terms and conditions to maintain historical return flows are limited to uses of the subject water right, within the terms of its decree. Under Rule 10, other water can be used to maintain the full amount of the historical seepage and return flows from each improved surface water irrigation system to fulfill the requirements of Article IV-D of the Compact. However, if the other water will require a change of water right or plan for augmentation for this new use, then the Division Engineer

will deny the application and direct the applicant to file an application for approval of a change of water right or plan for augmentation in accordance with § 37-92-302, C.R.S.

Rule 9 gives the standards for Division Engineer review of applications, whether under Rule 8 or Rule 10. Under either rule, the Division Engineer will evaluate the effect of the improvements using the ISAM plus any additional information the applicant has provided. Rule 9.C discusses the terms and conditions that can be applied in either a Rule 8 or Rule 10 approval. It specifies that for Rule 8 approvals, the Engineers may only adjust the terms and conditions for the first three years after initial approval. This was a balance between the Engineers' need to be able to make necessary adjustments as they gain experience with this new process, and the irrigators' need for certainty when making investments in expensive system upgrades. For Rule 10 Plans, terms and conditions may be adjusted as necessary for each Plan year. Rule 10.E.

3. General Permits:

Alternatively, certain improvements may qualify for a general permit under Rule 11. Rule 11 general permits allow the State Engineer to streamline the process for groups of improvements that he determines are within the scope of the rules but do not need to be evaluated individually because they will not cause a violation of the Compact. Advisory Committee members representing users with very senior water rights in the Upper Basin and users on tributaries that are controlled by a local call and that do not typically contribute flow to the mainstem of the Arkansas advocated for this streamlined approach to Rules compliance for such users. Three general permits have been adopted by the State Engineer. They will be effective on the effective date of the Rules, and are being submitted in water court along with the Rules.

For an improvement that is covered by a general permit, the irrigator need only file a notice that he is making the improvement and which general permit it qualifies under, but not an application under Rule 8 or 10. The notice will allow the Division Engineer to monitor the number of such improvements and periodically evaluate whether the permit remains appropriate, and also to check that the irrigator is not improperly increasing acres and is otherwise in compliance with Colorado water law when converting to the improved irrigation system.

CONCLUSION

The State Engineer has determined that certain improvements to surface water irrigation systems, such as sprinklers and drip systems that replace flood and furrow irrigation, or canal-lining that reduces seepage, have the potential to materially deplete the usable waters of the Arkansas River in violation of the Compact. The Irrigation Improvement Rules optimize use of the waters of the Arkansas River by allowing such improvements in a manner consistent with the terms of the Compact.

The State Engineer plans for the Rules to become effective on January 1, 2011, or after protests are judicially resolved, whichever is later. If protests are resolved prior to the effective date, the Division Engineer will begin accepting applications early from any irrigators who wish to get an early start on implementation. Rule 17.

EXHIBIT A:

DIVISION 2 COMPACT RULES ADVISORY COMMITTEE MEMBERSHIP AS OF JUNE 25, 2008:

Arkansas Basin Round Table	Tom Brubaker	Businessman (CEO, Valco Sand and Gravel)
Arkansas Ground Water Users Association (AGUA)	John Sliman	Owner Southwest Sod Farm; Excelsior and wells
Arkansas River Compact Administration	Jennifer Gimbel Steve Miller (staff)	CWCB Director
Arkansas River Compact Administration	Matt Heimerich	Farmer; Colo. Canal & Crowley County Commissioner
Arkansas River Compact Administration	Colin Thompson	Farmer; Amity and wells
Arkansas Valley Ditch Association	Dan Henrichs	Superintendent Highline Canal
Bent County	Burt Heckman Mike Spady (alternate)	Farmer; Fort Lyon Farmer; Ft. Lyon & wells
Chaffee County	Tim Glenn	County Commissioner, advocate of right to ranch ordinances
Colo. Dept. of Health Water Quality Control Division	Greg Naugle Randy Ristau (alternate)	Unit manager, watershed program
Colorado Department of Agriculture	John Singletary Cindy Lair (staff)	Realtor and farmer; small ditch right and wells
Colorado State University	Dr. Tim Gates Dr. Luis Garcia (alternate)	Engineer; Professor in Engineering Dept. CSU Dept. Head
Colorado Water Protective and Development Association (CWPDA)	Matthew Proctor	Farmer; Catlin Canal and wells
Custer County	Sara Shields	Rancher
Las Animas County	Ken Torres	Rancher / Commissioner
Lower Arkansas Valley Watershed Association of Conservation Districts	Don McBee	Farmer; Fort Lyon
Lower Arkansas Water Conservancy District	Jay Winner	District Manager
Lower Arkansas Water	Bill Grasmick	Farmer; Lamar & wells

Management Association (LAWMA)	Don Higbee (alternate)	Manager of LAWMA
Natural Resource Conservation Service	Frank Riggle	Asst. State Conservationist – Water
Otero County	Bob Bauserman	Retired Farmer; Colorado Canal
Prowers County	Dale Mauch	Farmer, Ft. Lyon
Pueblo County	Tom Rusler	Farmer, Bessemer Ditch
Purgatoire River Water Conservancy District	Jeris Danielson	Engineer, District Manager
Southeastern Colorado Water Conservancy District (SECWCD)	Scott Reed	Banker, SECWCD Board Member
United States Geological Survey	Pat Edelman Ken Watts (alternate)	Chief Pueblo Subdistrict- water quality specialist
Upper Arkansas River Watershed Association of Conservation Districts	George Fosha	Rancher / Engineer
Upper Arkansas Water Conservancy District	Ken Baker	Attorney
Water District 67 Users Association	Glen Wilson	Farmer; Amity
Discretionary # 1	Steve Leonhardt	Attorney SECWCD
Discretionary # 2	Bill Warmack	Engineer (Applegate)
Discretionary # 3	Ryan Hemphill	Farmer; Ft. Lyon / Engineer
Discretionary # 4	Don Steerman	Attorney WD 67 Users
Discretionary # 5	Gary Steen	Engineer- Fountain Mutual Irrigation Company

Others who participated significantly in the development of the Rules:

Bob Hamilton	Engineer, SECWCD
Fred Heckman	Farmer, Ft. Lyon Canal
John Hill	Attorney, AVDA
Alix Joseph	Attorney, SECWCD
John Lefferdink	Attorney, Ft. Lyon Canal
Brady McElroy	NRCS
Steve Monson	Attorney, Chaffee County and Fountain Mutual Irr. Co.
Peter Nichols	Attorney, Lower Ark Valley WCD
Terry Scanga	Manager, Upper Ark WCD
Lorenz Sutherland	NRCS
Julianne Woldridge	Attorney, PRWCD and Upper Ark WCD

EXHIBIT B:

Feb 6, 2009

The Solutions Sub-Committee makes the following recommendations to the Arkansas River Irrigation Consumption Rules Advisory Committee:

- A. The Sub-Committee supports and appreciates the willingness of the Lower Arkansas Valley Water Conservancy District (LAVWCD) to establish ongoing means and methods to assist farmers and ranchers in complying with the Rules, including the development of individual and group Rule 10 Compliance Plans and to enter into intergovernmental agreements between itself and entities outside of its specific boundaries when necessary to support the development of group Rule 10 Compliance Plans throughout the Arkansas River Basin.
- B. The Sub-Committee also supports the Upper Arkansas Water Conservancy District's intent to take the lead on compliance efforts for irrigators above Pueblo.
- C. The Sub-Committee also encourages the formation of group Rule 10 Compliance Plans in areas such as the Upper Basin, Fountain Creek and the Purgatoire River.
- D. Water users should be free to choose to apply for Rule 10 Compact Compliance Plans as individuals or as a group of water users, as a member of a water user association, a shareholder in a ditch company, or in any other combination that is determined to be beneficial as experience is gained.
- E. Approval of General Permits, Rule 7 Plans³, and Rule 10 Compliance Plans should be non-expiring and not require applicants to resubmit redundant information on a yearly basis to the extent practicable. The State Engineer's goal is to make the approval process as simple and as streamlined as possible. Ultimately there will be only one application filed for each improvement, or group of improvements, with annual updates of projected irrigation, maintenance flows and accounting, under either an individual plan or a group plan.
- F. The Sub-Committee recommends that group Rule 10 Compliance Plans should include terms and conditions that allow the group to take credit for *accretions* in return flows at appropriate times and locations due to improvements covered under the same Rule 10 Plan or by agreement with another Plan.
- G. For improvements to irrigation systems diverting from the mainstem below Pueblo Reservoir or diverting from tributaries to the mainstem below La Junta, the Rule 10 Compliance Plans should require maintenance flows to be provided in the same general location as the pre-improvement return flows to the fullest extent reasonably possible. For improvements to systems located upstream of Pueblo Reservoir or upon a tributary to the mainstem above La Junta, providing the maintenance flows by releasing water from Pueblo Reservoir will suffice where reasonably necessary due to lack of available storage or water supplies upstream or upon a tributary above La Junta. In determining "reasonably necessary," the costs and locations of storage and supplies upstream shall be evaluated and a determination shall be made based on whether provision of maintenance flows upstream or on the tributary is materially more expensive or otherwise burdensome on the applicant than release of maintenance flows from Pueblo Reservoir. Storage

³ "Rule 8 Plans" were called "Rule 7 Plans" at the time these Subcommittee Recommendations were written.

- releases in Rule 10 Compliance Plans should be administered as necessary to assure Compact Compliance.
- H. The Sub-Committee recommends the LAVWCD use Fry-Ark return flows as a source of water for maintenance flows to the greatest extent possible, recognizing that Fry-Ark return flows may only be used to benefit water users within Southeastern District boundaries, consistent with Southeastern's policies and other conditions on use of these return flows, and recognizing the need to balance the use of these waters for this purpose with well users' historical reliance on such water for their well replacement plans. The Sub-Committee requests the Southeastern District and ditch companies to cooperate with LAVWCD to facilitate the use of these return flows in Rule 10 Compliance Plans where eligible.
 - I. The Sub-Committee recognizes the significant work of the Engineering Subcommittee to peer-review and refine the Irrigation System Analysis Model (ISAM), including the parameters adopted from the H-I Model and whether they were correctly applied. The Sub-Committee recognizes the ISAM must be consistent with the legal constraints of *Kansas v. Colorado*, including the H-I Model.
 - J. The Sub-Committee recognizes that the LAVWCD will hire an engineer soon, either in-house and/or consulting, to attend the Engineering Sub-Committee meetings and to review the models, data, and assumptions Division 2 has developed in consultation with the Engineering Sub-Committee and proposes to use to evaluate compliance with the Proposed Rules, as well as to assist in developing group and individual Rule 10 Compliance Plans, and to assist farmers and ranchers in analyzing whether to file as individuals or as part of a group.
 - K. The Sub-Committee recommends LAVWCD's engineer(s) begin investigating and evaluating other potential sources of water for use in Rule 10 Compliance Plans, in addition to Fry-Ark return flows, including: water banks, interruptible supply agreements, crop following, acquisition of LAWMA shares, Tri-state's LAWMA shares, private sources, Pueblo Board of Water Works resources, and dry-up of low-yield farm land. Lower Ark and the Division Engineer's Office should meet with LAWMA soon regarding the potential for use of LAWMA shares in Rule 10 Plans.
 - L. The Division Engineer's Office should begin working cooperatively with the LAVWCD to develop application forms and generic and specific individual and group compliance plans so that they will be ready by January 2010 for implementation in March of 2010.
 - M. The LAVWCD should work directly with the irrigators who are covered by the Rules, handling the communications necessary to develop and update the compliance plan(s), and providing irrigators with engineering assistance that is independent of the Division Engineer's Office.
 - N. The LAVWCD should meet with administrative members of the Lower Arkansas Water Management Association, Colorado Water Protective Development Association, and/or Arkansas Groundwater Users Association to begin educating itself in best business practices for the development and administration of water user plans.
 - O. Irrigators who are likely to be subject to the Rules and who do not expect to join a group plan or develop an individual plan with the assistance of the LAVWCD should begin planning now to obtain appropriate sources of water to effect necessary compliance with the Rules in the 2010 irrigation season.

- P. The Sub-Committee supports the State Engineer's determination to enforce the Rules prospectively and not retroactively, which will ease the initial burden of compliance.
- Q. Ditch companies should consider exercising in April 2009 their right of first refusal on part or all of their Fry Ark Return Flows, from which some lagged flows will be available for use in 2010 for compliance plans.
- R. LAVWCD, the Colorado Water Conservation Board and the State and Division Engineers' Offices, should work cooperatively to examine and pursue any and all avenues to obtain funding for engineering services, water supplies, and storage for Compact Compliance Plans, including from State and Federal appropriations, grants and loans, and specifically the USDA Agricultural Water Enhancement Program (AWEP).
- S. The Sub-Committee supports the CWCB's request in S.B. 09-125 for \$250,000 in the 2009 Projects Bill to support the LAVWCD's efforts to develop compliance plans and otherwise to assist the irrigators in complying with the Rules. The Sub-Committee recognizes that it may take three to five years to refine Rule 10 Compliance Plans so that they reach the same level of acceptance and routine operation now evident in well replacement plans, and that the LAVWCD will need financial assistance during that period to work effectively with irrigators and the Division Engineer to reach that state of compliance.
- T. LAVWCD should project and plan for long term Compact compliance requirements under the Rules, so that farmers can have confidence that their Rule 10 Compliance Plan will be adequate for the long term.
- U. Although the evaluation of each improvement will be on a farm-by-farm basis, the LAVWCD should create models for each ditch system to estimate the impact of a installing an improvement and drying up some land, such as one to four corners for a circle sprinkler, as offsets, so that farmers can come into the LAVWCD office and estimate how much a Rule 10 Compliance Plan for an improvement will cost annually, and for some reasonable period into the future.