

DEVELOPMENT OF REPLACEMENT WATER SUPPLIES BY THE LOWER ARKANSAS WATER MANAGEMENT ASSOCIATION

Thomas A. Williamsen¹

ABSTRACT

The Lower Arkansas Water Management Association (LAWMA) was formed in 1973 as a “membership” association for the primary purpose of providing replacement water to allow its members to operate their wells under the rules and regulations enacted by the State Engineer. The purpose evolved somewhat by the rulings of the Special Master and U.S. Supreme Court in Kansas v. Colorado to also include the development of a program to replace well depletions both to Colorado surface water rights and to usable flow at the Colorado-Kansas Stateline in compliance with Colorado law and the Arkansas River Compact. In 1998, LAWMA re-organized as a non-profit corporation and issued stock to its members. LAWMA has purchased direct flow and storage water rights at a cost basis of value cost of \$8.75 million and fallowed 8,283 acres of surface water irrigated farms to develop a water rights portfolio so that its members could continue to use their wells. LAWMA also has executed management agreements wherein members put up the water rights and LAWMA incorporates those water supplies with LAWMA’s other water supplies to replace depletions caused by members’ wells. The paper describes how LAWMA obtained and pooled the water supplies in order to replace the depletions caused by its members’ well pumping.

INTRODUCTION

Irrigation canal construction began in the 1870s in the Arkansas River basin in southeastern Colorado. These early canal systems appropriated most of the available stream flow, so the later ditch builders constructed storage reservoirs to regulate the stream flows exceeding the direct flow demands. Even with the reservoir storage, the irrigation demands usually exceeded available supplies.

The Arkansas River Compact was negotiated by representatives from the states of Colorado and Kansas and was enacted by Congress in 1949. John Martin Dam was completed by the Corps of Engineers in 1948 and became a key element of the Compact. John Martin Reservoir is located on the Arkansas River 58 miles west of the state line. It currently has a conservation and recreation pool capacity of 348,683 acre-feet and flood control storage of 259,562 acre-feet (ARCA 1993).

In the 1950s and 1960s, high capacity irrigation wells were constructed in the valley-fill aquifer of the Arkansas River to supplement the surface water supplies

¹ President, Helton & Williamsen, P.C., 384 Inverness Parkway, Suite 144, Englewood, CO 80112; twilliamsen@helton-williamsen.com.

and to irrigate additional land. The development of irrigation wells went largely unchecked until the “Water Rights Determination Act of 1969” was enacted by the Colorado legislature. This required that wells be included into the appropriation system so well owners had to register their wells with the State Engineer and obtain a decree from the District Court establishing a priority date, use, diversion rate and place of use. Since the water rights for the wells are junior in priority to the surface water diversions, the State Engineer enacted rules governing the use of the wells in 1973 (State Engineer 1973).

The Lower Arkansas Water Management Association, LAWMA, was formed in 1973 as a “membership” association for the primary purpose of providing replacement water to allow its members to operate their wells under the 1973 Rules. LAWMA’s mission has expanded in response to the rulings of the Special Master and U.S. Supreme Court in Kansas v. Colorado, No. 105, Original to also include the development of plans to replace depletions caused by well pumping both to Colorado senior surface water rights and to usable flow of the Arkansas River at the Stateline in compliance with Colorado law and the Arkansas River Compact. In 1996, the State Engineer amended the Rules and required that the well users annually submit for approval a “Rule 14 Plan” which identifies the amounts of allowable pumping, the resulting depletions, and the sources of water used to replace the depletions (State Engineer 1996a). The State Engineer also issued Measurement Rules in 1994 and amended in 1996 that require wells be metered or measured indirectly by use of power consumption coefficients (State Engineer 1996b). The Measurement Rules include verification procedures and standards required to assure the accuracy of the measurement device.

In 1998, LAWMA re-organized as a non-profit corporation and is now operated in a manner similar to a typical Colorado mutual ditch company. Replacement water is delivered to the Arkansas River to make up or replace the depletions to the stream flow caused by pumping the wells. LAWMA has issued 18,934 shares of common stock to its members. LAWMA’s purchases of direct flow water rights and storage, leases of water rights, and operational agreements have been pooled to allow its membership to continue use of their irrigation wells while developing a marketable asset that can be used for other purposes.

SETTING

The Arkansas River originates in the central Rocky Mountains near Leadville and runs southeasterly through Colorado to Kansas. The drainage area at the state line totals about 25,000 square miles. LAWMA’s primary service area is the Arkansas River main stem below John Martin Reservoir in Bent and Prowers Counties, but it has members above John Martin Reservoir near La Junta and Las Animas and in the tributary areas of Big Sandy Creek and Two Butte Creek. LAWMA’s headquarters are located in Lamar, the largest city in the area with a population of 8,500, an elevation of 3,600 feet and average annual precipitation of 12 inches.

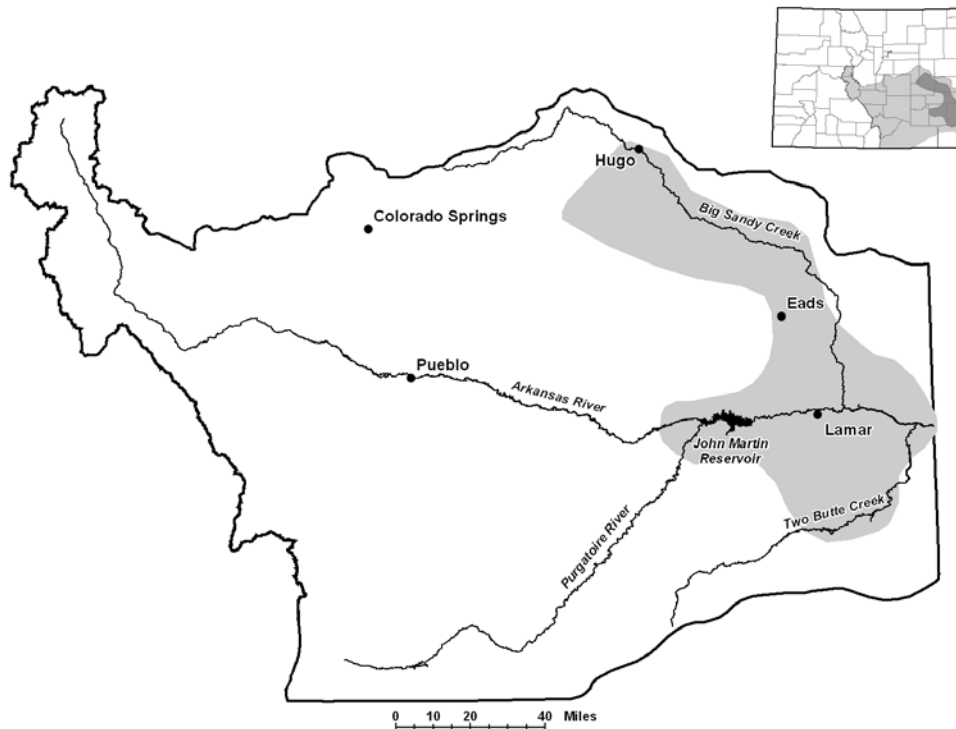


Figure 1. General Location Map Showing LAWMA's Service Area

The economy of the area derives largely from agriculture. The principal irrigated crops include alfalfa, corn for grain and silage, grain sorghum and onions. Dry land crops include winter wheat and sunflowers. There are several large beef feed lot operations, the largest being the Colorado Beef facility near Wiley. Also several swine confinement feeding operations started in recent years.

LOWER ARKANSAS WATER MANAGEMENT ASSOCIATION

LAWMA's powers and authorities are set forth in its Restated and Amended Articles of Incorporation and Bylaws. A seven-member elected board of directors (currently all seven are farmers) controls and manages the business and affairs of LAWMA. In general, the amount of replacement water provided by LAWMA to each shareholder member is directly proportional to the number of shares of common stock owned by the shareholder member which then converts to a volume of pumping by the shareholder's wells. Shares can be sold and transferred upon approval of the board of directors to different farm units or changed to a different use such as for wells used for industrial or municipal purposes.

For non-shareholder members, the rights and obligations relating directly to augmentation of the wells and other structures owned or operated by those members are established by written contract between the non-shareholder members and LAWMA. To provide a permanent replacement supply, the non-

shareholder members will exchange water rights for shares issued by LAWMA according to a predetermined exchange formula.

Description of Member Wells and Other Structures

For its 2005 Rule 14 Plan, LAWMA included 520 wells that were in use prior to 1986. Further broken down by use, 476 wells were used for irrigation, 31 wells were used for municipal purposes, and 13 wells were used for commercial purposes. Of the irrigation wells, 299 wells supplemented water deliveries by ditch companies and 177 wells were the sole sources of irrigation water.

Change of Water Rights and Plan for Augmentation

In December 2002, LAWMA filed with the Water Court for Colorado Water Division No. 2 an application to: 1) change the use of its water rights from irrigation purposes to augmentation and replacement of depletions caused by wells and other structures used for irrigation, domestic, commercial, municipal, industrial, livestock, fish, wildlife, recreation, power generation and other uses and 2) adjudicate a plan for augmentation. The changed water rights will be used in the Rule 14 Plans and in the plan for augmentation.

LAWMA's plan for augmentation is a procedural description or plan of how a well or structure developed after 1985 may continue to operate against the priority system by replacement of its depletions. Typical post 1985 uses include: 1) industrial and commercial uses such as gravel pits, concrete batching facilities, oil and gas production facilities, beef feed lots, swine confinement production facilities, and truck washes, 2) municipal and rural domestic water systems, 3) irrigation of the school grounds and athletic fields, cemeteries, parks, and agricultural crops, and 4) fish, wildlife, and recreation uses. In some cases the members have purchased LAWMA shares or assigned water rights to LAWMA to cover the depletions. LAWMA combines the water yields of the assigned water rights with its yields from direct flow and storage water rights and then distributes the combined replacement supplies as needed to replace the depletions. When the pending case is finally adjudicated, LAWMA will annually submit to the State Engineer a projection of the depletions for the users covered by the plan for augmentation and a schedule of the replacement deliveries.

Colorado law required LAWMA to provide notice to other water users in the Arkansas River basin of its intent and to allow others to participate in adjudicating the case. There were 18 parties that submitted statements of opposition to LAWMA's case. Terms and conditions were developed and negotiated with the objectors to resolve potential injury issues such as determination of depletions, timing and amounts of historical return flows, volumetric limitations on the use of the changed water rights, measurement, accounting, dry-up, re-vegetation of fallowed fields and others. Settlement negotiations were successful and

stipulations were executed with all objectors. The State Engineer, as an objector, tentatively approved a stipulation pending comments to the proposed decree from Kansas. Two other objectors tentatively approved a stipulation pending the State Engineer's suggestions for incorporating Kansas' comments in the final decree. By settlement with objectors, LAWMA avoided a three-week long trial before the Water Court in April 2006. When the pending stipulations are executed, LAWMA will ask the Water Court to enter a decree that incorporates the terms and conditions negotiated with objectors.

WATER RIGHTS ACQUISITIONS

Since 1989 LAWMA has purchased direct flow water rights in one irrigation ditch located upstream and five irrigation ditches downstream of John Martin Reservoir. Under the Arkansas River Compact, water is stored in John Martin Reservoir during the non irrigation season and during times when the inflow exceeds downstream demands. The storage water is distributed into "Article II Accounts", 40 percent to Kansas water users and 60 percent among 9 Colorado ditches located downstream of John Martin Reservoir (ARCA 1980). Water from the accounts is released on demand of the owner to supplement the direct flow diversions during the irrigation season. LAWMA's full ownership of three and partial ownership of two Article II Accounts provides carryover supplies to balance the yearly fluctuations in the water supplies available under the direct flow water rights. Combining the storage water with the direct flow sources provides considerable flexibility in meeting the replacement needs of its members. Pertinent details of LAWMA's water rights acquisitions follow and also are summarized in Table 1.

Table 1. LAWMA's Water Rights Acquisitions

<u>Canal</u>	<u>Purchase Year</u>	<u>Dry-up (acres)</u>	<u>Cost</u>
Sisson-Stubbs	1989, 2006	480	\$697,000
Manvel	1993, 1996	392	\$662,000
Fort Bent	1994, 2001, 2004	84	\$204,000
X-Y	1996	3,488	\$1,950,000
Highland	1997, 1998, 2001	2,867	\$2,970,000
Keesee	2004	<u>972</u>	<u>\$2,270,000</u>
	TOTAL	8,283	\$8,753,000

Note: The Sisson-Stubbs cost includes the value of 354 LAWMA shares at \$1800 per share + \$60,000 cash paid to the seller. The Fort Bent acquisition cost in 2004 includes the value of 85 LAWMA shares at \$1800 per share traded to the seller.

LAWMA financed \$7.963 million through low interest (2-3 percent) loans from the Colorado Water Conservation Board (CWCB). The indebtedness works out to \$421 per LAWMA share.

The X-Y Ranch purchase requires further explanation because it was the only water rights acquisition that included a substantial block of land. In 1996, LAWMA purchased most of the 5,500-acre X-Y Ranch, 67 cfs out of 69 cfs of the direct flow water right for the X-Y Canal and all of the X-Y/Graham Article II Account. The irrigated acreage totaled 3,488 acres. The Colorado Division of Wildlife (CDOW) purchased about 3,300 acres, re-vegetated it and developed the X-Y Ranch State Wildlife Area. As part of the sale to CDOW, LAWMA agreed to replace the depletions caused by up to 1,475 acre-feet of well pumpage which is used to irrigate up to 676 acres of wildlife feed plots and to fill shallow ponds during fall migration. The remainder of the land was sold without water rights. LAWMA's net cost of the water rights was \$1,950,000.

Leases and Contractual Agreements

LAWMA has executed agreements with certain members who bring water rights to LAWMA in exchange for replacement water supplies managed by LAWMA under substitute water supply plans annually approved by the State Engineer. When LAWMA's plan for augmentation is approved by the Water Court, these users will be included in LAWMA's plan for augmentation. In general, LAWMA manages the water rights as part of its portfolio and accounts for the member's replacement needs. Replacement water exceeding the member's need is available for LAWMA's use. The yield of the water rights and limit on the member's use is based on the expected dry year yield of the water rights. Accordingly, LAWMA has use of the net excess in average and wet years for its members. The advantages to the member are an economy of scale because it is more efficient, water and dollar wise, to develop an umbrella-type plan for augmentation with a pool of water resources than to develop an individual plan for augmentation using a single source of augmentation supply. Descriptions of these agreements follow.

Five Rivers Ranches (formerly known as Colorado Beef): Five Rivers operates an 80,000-head capacity feed lot operation about 10 miles west of Lamar. They use alluvial wells to produce the livestock water and other water needed for operation of the feedlot. Five Rivers purchased the "West Farm" located just east of Lamar and the associated shares in the Lamar Canal and Irrigation Company. Five Rivers committed 3,477 shares (13.3 percent of the outstanding shares) and up to 999 acres of dry-up under the 1995 agreement.

Colorado Division of Wildlife (CDOW): CDOW operates a fish hatchery near Las Animas, upstream from John Martin Reservoir, and the Higbee State Wildlife Area east of Lamar. CDOW purchased the Lamar Canal and Fort Bent Ditch water supplies, represented by 4,720 Lamar shares (18.1 percent of the outstanding shares) and 401 Fort Bent shares (3.4 percent of the outstanding shares), from the owners of the "Center Farm". LAWMA included the CDOW shares in its change of water rights and included the Las Animas Fish Hatchery and other recreational facilities in the plan for augmentation. The water

attributable to the shares will be delivered back to the Arkansas River through augmentation stations from both canals. LAWMA will use the delivered water in its Rule 14 Plans and the plan for augmentation and in return will provide replacement water for depletions caused by CDOW facilities within LAWMA's service area from LAWMA's pool of water rights. For this service, LAWMA retains 15 percent of CDOW's water supplies for use by LAWMA's members.

City of Lamar: The City of Lamar and LAWMA executed a memorandum of understanding in which LAWMA may use the City's 50 Lamar Canal and Irrigation Company shares and any of the City's water available under 1,316 shares of Fort Bent Ditch Company stock in amounts over and above the City's needs. The City has a well field in the Clay Creek basin (a tributary of the Arkansas River about 5 miles east of Lamar) that provides the City's potable water supplies. Water from the Fort Bent Ditch is delivered to a recharge site along Clay Creek to recharge the aquifer. LAWMA delivers the 50 Lamar shares back to the river through the augmentation station and when available the Fort Bent shares through an augmentation station. LAWMA changed the use of 923 shares of the City's Fort Bent stock and the 50 Lamar Canal shares from irrigation to include augmentation and replacement purposes for use in LAWMA's Rule 14 Plans and plan for augmentation. The City will further change the use to include recharge of the Clay Creek aquifer and other more specific uses in a separate Water Court application.

Other Agreements: LAWMA executed several management agreements and leases with commercial entities involving 764 shares of Fort Bent Ditch Company stock. These shares are part of LAWMA's change of water rights and plan for augmentation. The water available to 356 shares is delivered to the Arkansas River through the augmentation station of which 207 shares are used in substitute water supply plans for several commercial entities. The remaining 408 shares also can be used by CDOW for irrigation of wildlife feed plots at the Higbee State Wildlife Area. It is planned that these users will trade their Fort Bent shares for LAWMA shares, and their future depletions will be replaced under LAWMA's plan for augmentation.

OPERATIONS

Administration and accounting of the well pumping and stream depletions are broken down into two categories: 1) those wells with decreed water rights before 1986 and are administered under a Rule 14 Plan and 2) those wells and structures developed after 1985 and administered under substitute water supply plans approved annually by the State Engineer or under a plan for augmentation decreed by the Water Court. Annually since 1996, LAWMA has submitted a Rule 14 Plan to the State Engineer. The Rule 14 Plan describes the projected well pumpage by each farm unit and shows how LAWMA's water rights will be used to replace the depletions with respect to Colorado water users and to Kansas. The State

Engineer's staff reviews the Rule 14 Plan and then issues an approval, if acceptable, with conditions.

The board of directors sets the allocation to shares based on the projected yield of LAWMA's water rights and carryover storage. The allocation is the amount of replacement water in units of acre-feet per share based on the 1) use of the well, supplemental or sole source, 2) irrigation system, gravity or sprinkler, and 3) the number of shares. The allocation is converted to an allowable amount of pumping per well or farm unit. Figure 2 shows the actual amounts of well pumpage covered under the Rule 14 Plans.

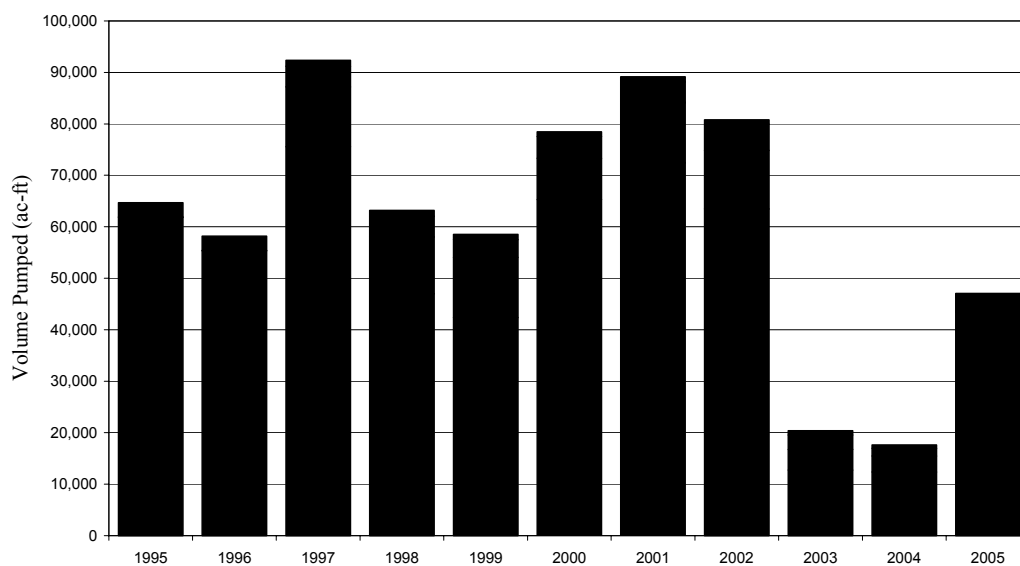


Figure 2. Annual Well Pumpage by LAWMA Members

The drought of 2002 reduced significantly the amounts of water available to some of LAWMA's replacement sources so LAWMA had to use most of its accumulated storage. The drought continued through 2003 and 2004 so the allocation was set much smaller in order to replace the depletions to the river caused by the earlier years' pumping and to accumulate storage. In retrospect, LAWMA should have been more conservative in the good water supply years so that there could have been more pumping in the drought.

Flow meter readings for those wells so equipped are submitted to LAWMA by the well owners monthly. LAWMA tabulates the readings and then submits the readings as a group to the Division Engineer, the State Engineer's administrative representative for the Arkansas River basin. Electrical power records are submitted by the power associations directly to the Division Engineer. For those wells relying on a power consumption coefficient (PCC), the pumping is calculated based on the supplied power record and the PCC for the particular well. The Division Engineer determines the consumptive use based on presumptive depletion factors and lags the depletion to the Arkansas River using response functions and user groupings.

LAWMA's replacement supplies from direct flow sources are quantified by stream flow gages located near the original points of diversion (Highland, Keesee, Manvel, X-Y and Sisson-Stubbs Ditches) or are delivered by the ditch company to the Arkansas River through designated augmentation stations (Fort Bent Ditch and Lamar Canal). LAWMA's Highland Canal water and LAWMA's Article II Account storage water can be bypassed or released from John Martin Reservoir to the river, as needed, to replace the depletions to Colorado ditches or can be transferred to the "Offset Account". This special account (ARCA 1998) was established to regulate replacement water delivered to John Martin Reservoir primarily for replacing depletions with respect to usable state line flow. Kansas can call for the water stored in the Offset Account at any time it is usable by Kansas. An annual charge of 500 acre-feet of fully consumable water (paid annually by LAWMA) for the first 10,000 acre-feet regulated in the account plus 5 percent of delivered water exceeding 10,000 acre-feet is solely for Kansas' use.

Monthly, LAWMA and the Division Engineer work together to coordinate the storage releases and transfers from LAWMA's storage water and to measure and record the direct flow deliveries so that the replacement water supplies match the stream depletions caused by LAWMA's members.

FUTURE

As provided in LAWMA's Bylaws, LAWMA is implementing a procedure to issue preferred stock to those members needing a non-curtable source of augmentation water. Non-curtable water uses include gravel mines, concrete batching facilities, beef and swine feeding operations, and other industrial and municipal uses for which the stream depletions are fairly constant from year to year. Additionally, such uses cannot reasonably or practically be curtailed. In operation of the plan for augmentation each year, LAWMA will assign a predetermined yield to the preferred shares and then adjust the yield available to the common shares.

LAWMA, CDOW and the Colorado Division of Parks (CDP) have executed an option to purchase the remaining one-half of the Keesee Ditch water rights. The Keesee Ditch direct flow and Article II Account water would be used 9 years out of 12 years by CDOW and CDP to replenish the 15,000 acre-foot permanent pool in John Martin Reservoir. Maintenance of a permanent pool is important for recreation and fish and wildlife uses. LAWMA would select 3 dry years out of 12 years to use the water derived from the Keesee Ditch for replacement purposes under Rule 14 Plans and the plan for augmentation. The purchase price is \$3.6 million of which LAWMA would pay \$1.26 million. LAWMA will finance their cost by issuing and selling 400 shares of preferred stock at a price of \$3,166 per share to its members. The Arkansas River Compact Administration must agree to allow CDOW and CDP to use the Keesee Ditch water for maintenance of the

permanent pool. Discussions are ongoing with Kansas and Colorado officials about using the water for this purpose.

Tri State Generation is planning the construction of a major coal-fired power plant in southeastern Colorado and has begun purchasing water rights in the lower Arkansas River basin, including LAWMA shares. At this time it is not clear what role LAWMA will play in assisting Tri State with the development of a reliable water supply. But with LAWMA's storage supplies, varied portfolio of water rights and water management experience, LAWMA most likely will be involved.

CONCLUSIONS

Many water rights transfers from agricultural purposes to municipal and industrial uses in the Arkansas River basin involved transporting the water out of basin. LAWMA's water rights acquisitions have kept the water rights in the hands of the local users while developing marketable assets and making it easier to develop necessary water supplies for local economic development. LAWMA has been innovative and future thinking by pooling its water resources to efficiently and effectively provide water supplies to their members.

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