INPUT FROM THE THREE MEETINGS

Summary of input from 2016 Meetings on ATMs:

- State of Colorado/Getches-Wilkinson Center—October 7
- Colorado Water Institute—November 4
- Interbasin Compact Committee/Colorado Ag Water Alliance—November 29

This document contains information and input collected from participants of each of three meetings convened in the fall of 2016 on the subject of ATMs—Alternative Transfer Methods. It is an addendum to Colorado Water Institute Special Report No. 31, Where Now with Alternative Transfer Methods—ATMs—in Colorado? published in April, 2017. The report is available at http://www.cwi.colostate.edu/publications/SR/31.pdf
Some of the points listed herein may seem redundant, but it is insight-producing for the reader to see how points were made by different participants in words they chose to use, providing considerable nuance.

Clarification of ATM definition, matching of purposes and methods. A clear, widely agreed upon definition of what is meant by ATMs, and understanding of the numerous motivations/purposes along with which methods are most suitable for each distinct purpose.

Definition

There are different views about what is meant by ATMs. Is it any shift of water use that does not permanently dry up irrigated land? Does it include transactions that only remove a portion of lands irrigated under a water right while remaining lands stay in irrigation? Is it only temporary shifts of water under leasing arrangements in which the water rights ownership stays with the irrigator and the temporarily fallowed lands will return to irrigation? Does it encompass traditional water court processes as well as administrative approval processes authorized in more recent statutes? How about urban to ag leases, in cases where cities have already purchased agricultural water for future municipal use but are leasing water back to agriculture for an indefinite term and are interested in creative approaches that will be beneficial for agriculture and the environment in the process? Is it all of the above? Should we develop a better definition?

Matching of Purposes and Methods

Especially in the first two venues, participants stressed the need to address the reasons, purposes, and goals for ATMs separately instead of lumping them together, to make better sense of the opportunities and the strategies. Example purposes cited include:

- Keep the call off the Colorado River—system conservation
- Meet the municipal supply gap—base supply
- Meet the municipal supply gap—drought contingency
- Enhance or restore environmental flows
- Maximize Ag production per unit of water diverted

Various points captured on this topic from the four sources:

- To date, ATM methods have been driven by multiple purposes: to support in-stream flows, to fill the municipal water supply gap, to limit the dry-and-buy of agriculture, or to conserve and shepherd water to Lake Powell and Lake Mead. However, the mixing and matching of different strategies to meet different purposes may not be ideal.
- The purpose will drive the process, including which stakeholders to include, and the best strategy for the purpose (e.g. rotational fallowing, deficit irrigation, irrigation efficiency, and crop switching.) We may have been approaching this issue backward by mixing and matching methods that actually serve very different needs.
- Changing to an approach driven by a single purpose as opposed to perfecting different mechanisms for different contexts may be more helpful when engaging irrigators to participate in these programs. We need clear goal(s) about why irrigators should lease water.
- Some potential ATM participants may be receptive to one purpose, such as compact compliance, but skeptical about other purposes, like urban water supply. ("I want system conservation so the government doesn't do it for me. But I don't support ATMs to provide water so urban communities can have green lawns. Avoiding the compact call is the most important thing to accomplish.") These doubts are distractions and not necessarily representative of what is actually going on. A clear mission would work to dispel false assumptions.
- Prevention of a compact deficit is likely the purpose most likely to resonate on Colorado's west slope. However, meeting the goal of avoiding a compact deficit through ATMs may also address instream flows and provide other benefits.
- "Something that has bothered me for a while is that it is widely believed that increasing irrigation efficiency will make plenty of water available for other uses. The truth is that oftentimes increasing irrigation efficiency increases consumptive use, so if your goal is to fill Lake Powell, irrigation efficiencies probably aren't your answer.
- "I think addressing the reasons separately makes sense in some cases as long as you realize that one ATM project can have multiple benefits. For instance, improving stream flows can also be a benefit of a project whose primary purpose is compact compliance."
- "ATMs can have different purposes depending on where they are—Arkansas Basin, South Platte, West Slope—and what you are trying to accomplish."
- "Purpose will drive what you need to do; your purpose needs to be clear from the beginning. Your goal should drive your strategy, not the other way around." For instance, split-season fallowing of alfalfa has been shown to be a good ATM for improving environmental flows and might also be a good means for providing water for system conservation if shepherding challenges could be solved. It may not work as well for freeing up water for base urban supply.
- There are differences between the types of ATMs required for municipal-type water supplies and those used for Colorado River Compact insurance and drought recovery. These two categories have different needs, both in terms of legal framework and infrastructure requirements.

- The end use of an ATM should be clarified. We talk about applying ATMs to a variety of different types of water demand, but the end use makes a difference in the type of arrangement that's appropriate.
    - One category is **making pools of water available to meet short-term but periodic needs.** An example is the work on the West Slope to develop a water bank that could, as a component of a strategy to address the Colorado River Compact challenges, make water available as necessary to avert or respond to a Compact call. In theory, no water would move out of agriculture except under defined circumstances. But when the situation arises, the need for water could be substantial but perhaps only for a short period of time. Both West Slope water users and East Slope trans-mountain diverters have a significant interest in this issue. Federal water projects on the West Slope present unique opportunities and different types of challenges for ATMs.
    - A related but somewhat different example is provided by the System Conservation Pilot Program to **make some historically unavailable water available to the Colorado River system** in Lake Powell to help maintain lake levels for hydropower generation and to ensure that Lower Basin required deliveries are met. Presumably these transfers are not permanent but only needed periodically to meet drought and demand management needs. These pilots may lead to a water bank designed to ensure Colorado can respond to any Compact call without undue disruption of essential in-state water uses. These could be considered true ATMs because they do not require any permanent dry-up of irrigation, and may involve making improvements to existing water uses and facilities and could provide some payments to irrigators.
    - **Drought response needs** are similar, whether on the East Slope or the West Slope, in that reservoirs must be replenished after dry years, but the need is sporadic. In these situations, agreements need to be in place; the ability to produce perhaps considerable amounts of water in a short time must be in place; and the mechanism for ensuring this can occur without harm to other water users must be ready for smooth implementation.
    - A different type of ATM involves transfers **to satisfy municipal needs**. While permanent ownership may not be needed, municipal suppliers need to have certainty that the water derived from ATMs will continue to be available to them. These supplies may only be needed for certain years (perhaps 3 years out of 10), but if the ability to access those supplies can disappear at some point in the future, municipal suppliers may not be interested. Both cities and farmers/ranchers prefer arrangements that provide certainty about the lease price from year to year.
    - Some form of ATM has long been viewed as potentially useful to meet short-term needs prompted by droughts or other emergencies. Perhaps the simplest example is the ability of the CWCB to obtain a short-term loan of an irrigation water right to **maintain flows needed to protect the natural environment to a reasonable degree in a particular stream reach.** Colorado law also authorizes interruptible supply agreements

under which a buyer may obtain from a seller the option to use the seller's water for up to 3 years out of 10, with approval by the State Engineer's Office to ensure no injury. Water right ownership may remain with the irrigator. The agreement serves as an insurance policy for the buyer that may or may not be exercised.
    - Some progress is being made in the Arkansas to demonstrate the feasibility of providing **a long-term supply of consumptive use water for annual urban use.** The lease-fallowing (HB 13-1248) process, including the Lease Fallowing Tool (LFT), has proved workable to manage change of use issues.
    - Putting conservation easements on the irrigated lands to ensure that the water right will remain tied to the land appears to help address concerns that the water right might be sold to another party who would no longer be interested in the ATM arrangement at the end of its term, especially if the easement is held by the municipal provider or coupled with another enforceable real property interest in water right, such as a perpetual lease.

Transparent transaction enabling/promoting entities. A plan for establishing an ATM transaction entity structured such that interested parties would be motivated to use it to provide a neutral brokering role for conceptualizing and negotiating large scale ATM transactions. To begin, the plan would be for establishing such an entity on a pilot basin in at least two of the state's roundtable basins.

The following points were made, pertinent to this idea:

- Create an organized ongoing forum or work group where the problems and promise of rotational fallowing and other ATMs can be safely examined collaboratively by those on both sides of the transaction.
- Such an entity could be instrumental in helping ag and municipal parties find ways to reduce risk and increase long-term security for both
    - Farmers/ranchers and municipalities all worry about hydrological fluctuations and climate change. And while farmers/ranchers are concerned about volatile commodity prices and rely on profits from the peaks to carry them through the troughs, cities are concerned about unpredictable water prices and the security of their water supplies. Municipalities and farmers/ranchers must work together to reduce each other's risks, while increasing each other's long-term security.
- Such an entity could foster approaching ATMs from a regional approach. Regional approaches are preferable to localized or statewide approaches as they offer the opportunity for a larger scale.
    - "To generate sufficient water from agriculture for purposes of compact compliance, you would have to incentivize a large percentage of irrigators in places with native hay and grass pasture such as Colorado's Upper Gunnison basin. You would have to have lots of ranchers wanting to do it

to have enough scale to make it worthwhile. What is impact to downstream irrigators if only one rancher does it and others don't?
    - Currently, those doing rotational fallowing, deficit irrigation, and such are working in isolation from one another. This lack of coordination does not lead to a larger, manageable "water market." Without a larger "market" for leasing water, no meaningful value proposition can be met with a coordinated market. Isolated thinking and efforts can lead to unproductive, unhealthy, and faulty assumptions, planning, and positions by all parties interested in water leasing.
- Such an entity could foster a holistic approach that takes into consideration unexpected consequences of ATMS.
    - Will species such as the protected Gunnison Sage Grouse be affected negatively with drier fields?
    - Will altering return flow patterns negatively affect recreation such as river rafting?
- "Such a venue or forum would increase transparency. A fundamental problem now is that ag entities employing these programs and those who benefit from them are working in isolation from each other, which makes it difficult to have a managed water market."
    - "There is a lack of trust between those who have water and those who need it."
    - An ATM forum would provide the transparency necessary where problems of leasing can be examined collaboratively by both sides of the transaction. An open forum can also address the lack of trust and misunderstanding between parties, and encourage identification and achievement of shared interests while recognizing differences
- "Such an entity could, for instance, help identify the practicality of using a particular strategy for a particular end goal. It could help answer questions like 'is it feasible to use rotational fallowing for conserved consumptive use to avoid a compact call, given the long list of economic, legal, and social concerns?' Many things *can* be done that *should not* be done."
- Such as entity could provide the impetus for forwarding to the legislature the need for statute changes.
    - We should codify a conserved water statute and saved water statute
    - We should address language in Colorado Senate Document 80—to fix restrictions on water rights that obstruct Ag/environmental transactions.
- Whether or not a new entity is needed, and what form an entity might take was discussed.
    - Do we need an entirely new entity or can this function be taken up by an already existing entity(s)? Several working organizations in Colorado could lend expertise to this issue, including the basin roundtables. The West Slope Water Banking Work Group, the System Conservation Pilot Projects (SCPP), and the Upper Colorado River Commission (UCRC) are either involved in similar projects or can provide the infrastructure for a working group more focused on ATMs.

    - Whatever forum is established, it will need to be able to collect money, manage payments, and staff would have to be trained to do these transactions.
    - State involvement is a key factor. For Colorado, having the CWCB involved adds a level of objectivity and ability to mediate between different stakeholders.
    - One option is regional ATM forums: a statewide organization with individual geographic units. These groups would be geographically based and driven by local purposes. On the Western Slope, the forums would most likely focus on Compact Compliance. On the Front Range, the emphasis may be on meeting the municipal water supply gap.
- Such an entity might provide a venue for taking advantage of partnership opportunities. "A clear relationship should be established with the state land conservation community for the co-development of strategies by which land conservation goals and ATM goals can be mutually met. We should bring together the state land conservation community and water transfer proponents to complement efforts and foster creative ideas."
- Such an entity could investigate and promote creative strategies brought forward by potential buyers and sellers such as joint ownership of land/water between the agricultural entity and municipality for certainty and flexibility and recognition of the role of urban to ag leases in cases where cities have already purchased ag water and are willing to create mutually beneficial opportunities regarding the future of that water. Such an entity could help buyers and sellers investigate unique or creative pricing options that work for both. "Joint ownership could allow each side to plan, to manage together how to use the water for both needs. Helps create a functioning market and builds trust."

Pricing was discussed in all the venues. Some ideas generated and points made specific to pricing include:

- A transparent forum may also provide the best place for both sides of a lease to navigate the price discovery process. It is important to keep in mind that for an irrigator's water, they would have to be paid more than what they would have earned if that water went to agricultural production. Participating in a lease agreement may likely require more time and risk, and could impact future yields. Irrigators need to be compensated for this.
- We need a venue to ensure parties arrive at an appropriate and fair price for water leased.
- Transparency of price between irrigators and organizations is needed, similar to how prices of other commodities are disclosed without individuals' names. There is a lot of hesitancy among farmers to reveal too much information about their business dealings and what they would be making on a "water market."
- "It's important that negotiations between receivers and providers be done in the context of organization wide collective bargaining, so that the water doesn't just go to the lowest bidder."
- "I won't tell you my deal, but I'd like to know where the market is, so that the entities receiving don't come up and use that against us."

- “The water market can be improved by transparency.”
- “We need to work as an association, support one another by some disclosure of price.”
- Isolated thinking fosters unhealthy positioning. Better to encourage identification and achievement of shared interests while recognizing differences.
- “To aid municipalities who want to lease water, it may be helpful to create a template of regional Ag commodity prices to help them understand what farmers would want financially from a lease.”
- There are possible risk management devices to arrive at a price that would alleviate the fears of irrigators missing out on “bumper crop prices.” Commodity Indexed Prices could be one solution. Irrigators will get an agreed upon price to lease their water, but will be paid more if the price of the commodity they would have grown goes up. Another risk management device is to purchase futures in specific commodities to allow farmers to receive value of upward market spikes. However, an offsetting purchaser is necessary to make this work.

Common technical platform for consumptive use measurement, accounting, and verification. A plan for adoption of a standardized common technical platform for consumptive use measurement, accounting and verification, including State Engineer approval, that could garner acceptance as a means of greatly reducing high transaction costs while protecting private property rights.

Substantial support was expressed, from all four sources, for the development of presumptive factors and/or accepted methodologies that could be invoked by water rights owners to develop conservative consumptive use quantification and return flow obligations, similar to the Arkansas Basin’s Lease Fallow Tool. Appropriate sideboards and “opt-out” provisions should apply, and some path should be available for objection by other parties.

Several expressed the need to establish “presumptive factors” (or “accepted methodologies” or a “common technical platform”) that could be available for those willing to accept conservative presumptions to ensure no injury, leaving open the option to perform detailed engineering if desired or for farms that are not a good fit. Belief was expressed that we can use conservative modeling approaches such as are used in the SEO-CWCB HB13-1248 Lease Fallow Tool (LFT) to develop terms and conditions that prevent injury from ATM-related changes of use. Experience with lease-fallowing analysis of Catlin Pilot Project transactions was positive. Projects are currently allowed only for ten years and the authorizing legislation provides that lease-fallowing pilot projects must be selected before the end of 2018 and the authorization itself expires in 2030, making this arrangement only temporarily available to interested municipal suppliers. Should we consider making the HB 1248 process a permanent option in the Arkansas or throughout the state? Should the LFT be tailored for use in other basins? Or should basins/sub-basins decide what kind of ATM change of use process they would be most comfortable with?

Some of the points made in regard to this topic include:

- Adopting a common technical platform would simplify the process for transactions
- Any future working group on ATMs will need a common technical platform for measurement and accounting. It will be essential for participants in conservation programs to get credit for any conserved consumptive use water. These needs have a broad scope that can also help determine on a regional basis how much consumptive use water is possible for transfer. The platform would include transferable yield based on temperature, altitude, crop type and other factors.
- A common technical platform can simplify the process of transactions and employ simplified engineering tools to quantify consumptive use without having to go to court.
- We need to adopt a simplified engineering tool to quantify consumptive use of the water without having to go to court—to lower the cost of moving water through the process.
- The Lease-Fallowing Tool used on the Catlin Canal in the Arkansas Basin is one tool that could be adapted to leasing in the Upper Colorado River Basin and throughout Colorado. Proponents are willing to leave a little more water in the system than if they had taken it to court, because they saved the money they would have paid for lawyers and engineers for case by case quantification. The tool was designed to be transferable. Such a tool could facilitate deals by the Colorado Water Trust for environmental flows, compact compliance deals, and 3/10 interruptible supply deals for municipalities.
- To properly account for water leased, it would be necessary to meter diversions on the Western Slope that may be completely unregulated. For irrigators, it is less of an issue to put a quantifying meter on a diversion as long as there are improvements that come with it. Some diversions on the Western slope are already charged for water use based on flow measurements.
- The CWCB and the Bureau of Reclamation would have to be included to properly account for conserved consumptive water. Both entities have the means to meter and monitor diversions and flows to assist in proper accounting.
- "We need presumptive consumptive use methodology. Twenty good engineers working together could come up with it."

Professional support and network building for agriculture. Outreach to agricultural producers and their water managers through groups with which they associate, to help them access studies and work through the means by which they could agronomically and economically undertake such activities as rotational fallowing, deficit irrigation, crop switching or irrigation efficiency improvements in order to concurrently further the security of their water right and the profitability of their operations.

All sources of information for this report's recommendations emphasized that ATM success will rely on reaching out to agricultural producers and their water managers for

several reasons. One is to gain trust and pique interest. Another is to seek ways to scale up deals beyond the individual farmer level. Here are some points made in support of this recommendation

- "We need to strategize ways to effectively reach out to Ag producers to gain their interest in ATMs, to help them be more aware of and willing to use the water leasing and infrastructure improvement options available to them."
- We should provide help for ditch and reservoir companies to do long term planning to better secure their future in light of pressure on Ag water.
- One of the most important aspects moving forward is to include the participation and input of irrigators in developing these ideas.
- Producer community acceptance is a significant issue. Moving away from historical practices or participating in government-led projects are often frowned upon. Farmers prefer to grow crops than lease water and participate in ATMs.
- "The only reason irrigators are at the table is because they believe that something worse could happen if they aren't involved and that a conservation program would be forced upon them."
- If the goal of ATMs is to maintain agricultural production despite a compact call, rapid urbanization, or drought, irrigators can provide the best insight into actually making these programs work. They understand their systems better than anyone and are the ones being asked to assume most of the risk in these transactions.
- Despite the hesitancy of irrigators, there are many already participating in ATMs. They understand that there will be major problems for the environment, local community, and Western slope agriculture if they do not take action.
- Programs are more likely to work when irrigators are brought along slowly through the process.
- Farmers emphasize approaching entire groups of irrigators as opposed to individuals for ATM projects. Many ditch companies are managed by volunteers and don't have the resources to devote to planning and implementing such programs. The time and resources necessary for an ATM may discourage them from participating. Larger ditch companies with staff, resources, and multiple irrigators will most likely be more willing to participate.
- Working with a larger group also alleviates the fear among farmers that they will be "picked off" and "pitted against" each other by outside interests. With more irrigators involved in the conversation, issues relating to price and injury to downstream users can be better discussed in an open and transparent forum.
- Ditch companies need to also take the initiative and address their own operation issues. Many ditch companies have not altered their bylaws in decades, which often prevent one irrigator from leasing water out of the ditch for another purpose. Ditch-wide discussions need to take place to determine if they would allow leasing, and that conversation would also provide the opportunity for ditches to address concerns about leasing.
- There is so much untapped potential for collaboration on multi-purpose water supply efforts. For instance, senior agricultural water users and urban water providers could collaborate by utilizing their existing infrastructure and water portfolios to create new augmentation plans for securing a junior water right that

can be shared between the users to increase water supply and meet future demands. Also, urban water providers could utilize some of their reusable effluent to recharge the ground water in the irrigator's pond or canal to add supplies to the augmentation plan.

Ag producers interested in investigating ATM opportunities will want to understand what research has been done or could be done to ensure that participation will be agronomically and economically feasible for them. Some points made in regard to agronomics include:

- We need to investigate new technology, breeding, and chemistry to facilitate crops that require less water and make it available to Ag producers.
- We need research to find and promote a dryland species pasture grass for forage crops that uses less water
- Increasing water holding capacity of the soil, for instance through using cover crops, can help prevent evaporative losses.

It has been suggested that one means by which Ag producers could free up water for other uses such as municipal or environmental is by switching to crops that use less water. Points made include:

- Even though crop switching may be a possibility in some cases, it is important to keep in mind the formidable obstacles. Significant infrastructure (e.g. transportation, processing, farm equipment, labor, marketing, distribution, etc.) is required for producing any crop.
- For a shift in crops to occur, markets are paramount. On the Western Slope, markets are not just local, but regional and international. Farmers grow what is in demand and what is within their climatic constraints. There are also problems specific to each geographic region. For example, in Colorado's Grand Valley you cannot grow organic crops unless you can organically control spider mites.
- Another significant constraint that affects farmers is labor. Crops like corn, alfalfa, and pasture grass require less labor. High value crops require more labor which may not even exist in certain areas.
- The Nature Conservancy and other organizations have examined the potential of agriculture to cooperate with business and private investors to successfully shift crops.
- "Financial institutions are key for crop switching. Banks keep mortgages on farmland and as less water is used on the property, the value may go down. Switching to dryland crops or less water intensive crops may significantly impact how banks value the land. In order to even switch crops, irrigators would need access to loans and crop insurance for those crops, otherwise there is little incentive for them to make any change."
- There are certain pathways to move forward on the issue of crop switching. A regional market analysis to support shifting crops from those with high water demand to those with lower water demand would help. A thorough analysis could identify possible low-water crops that have unmet market demand. Another possibility is to examine alternative species of pasture grass that require less

water yet provide the same nutritional benefit as the current pasture forage in many places on Colorado's West Slope.

- "Farmers need an exit strategy, support to help them avoid problems when they venture into something as risky as crop switching for the purpose of making water available for other uses. They have to look toward the long term, and shouldn't be left hanging if things change."
- "One issue is that the producers' customers who were depending on the old crop (for instance hay for dairy cattle) will be left dry. We have to recognize that markets for our crops are not just local but regional and even international."
- Impacts go beyond the individual rancher who is going to get the ATM check. What happens to the herds dependent on the hay that is no longer being produced?
- "Farmers should employ life cycle analysis when considering crop switching—look at the big picture, start to finish."
- "Is there a strategy for creating a market first—before introducing an alternative crop?"
- A regional market analysis could provide data to support shifting crops from those with high water demand to those with lower water demand. Must consider regional economics as well as profitability for individual farmers. Have to understand what crops might be suitable to switch to, have to understand pricing for different crops, market for crops, infrastructure changes required, etc. Need access to loans for new crops, access to crop insurance for new crops.
- Who is going to provide support for the changes that would have to be made to make crop switching economically possible? We would need a risk management program to incentivize experimentation of crop switching.

Professional support and network building for domestic water providers Outreach to smaller municipalities and special districts whose needs and expertise differ from larger municipalities with greater planning resources to help them conceptualize means by which they might work together to transact water deals with agricultural water rights owners to satisfy their need for reliable water supplies for specified purposes such as future growth or drought protection. Outreach to larger municipalities and domestic water providers who have already purchased agricultural water for future municipal use and are currently leasing it back to agriculture, to help them conceptualize means by which they might work with agricultural and environmental stakeholders to create win-win solutions for all three sectors with that portfolio of water.

Municipal owners of Ag water

Many municipalities and domestic water providers have already purchased agricultural water for future municipal use. The term "purchase leaseback" has often been used to describe these arrangements. Rather than dismiss these as "deferred buy and dry" we can form collaborative alliances that enable them to work for the benefit of agriculture and even the environment as they plan their strategies for moving the water out of ag at

some future point. Agricultural cooperation with these municipalities should be encouraged so that creative win-win strategies can be tried.

The City of Thornton, for example, has reached out to agricultural, environmental, and urban stakeholders impacted by their purchase of agricultural water from the Water Supply and Storage Company for transfer south for urban growth, to help them develop the scope of work for a master planning effort. Since the agricultural water supplies they have purchased are not needed all at once, and a considerable amount not for many years and some as drought protection, they see potential for meeting mutual goals through collaboration.

System conservation framework and tools. A set of tools to be employed to address challenges of using ATMs to provide Colorado River system water to avoid a call on the river. Such challenges include the need to improve the ability of those using federal project water to participate in ATMS, and a means for shepherding the water through the system. One recommended tool may be a statute to make system conservation for compact compliance a beneficial use in Colorado.

Here are some points made pertinent to this issue:

- Shepherding water is a problem, so statutory change would be needed.
- Pilot projects like those made possible by the System Conservation Pilot Projects program funded by the BOR, Metropolitan Water District, Southern Nevada Water Authority, Denver Water, and the Central Arizona Project do not provide a means to shepherd the water from the Ag producer leasing it to the receiving end. This creates problems for Ag producers with their water commissioners since there is no proven “beneficial use.”
- Need to figure out how to shepherd water for system conservation projects: Determine how to verify ownership of leased water from source to end use when using it for water banking of system conservation projects. Those leasing water from agriculture should be responsible for verifying ownership of water from source to end use. The water leased should have a chain of custody. Water banking or system conservation projects leasing Ag water should have a place for the water to go—so that producers are in compliance with state law.
- “The elephant in the room is shepherding. We can’t do Compact compliance without it.” How to do it? A number of ways. For instance, instream flow statutes allow CWCB to designate reaches where water must flow for compact compliance.
- We should improve the ability of federal projects to participate in system conservation ATM deals.
- What would it take to eliminate the Bureau of Reclamation’s clients’ obligation to sell second use in order to enable more flexible markets? The Colorado-Big Thompson project’s secret is that they don’t have to sell to second use. What might happen if other Bureau clients were able to use that model?
- The Water Bank Group has done a lot of research into the potential water available for leasing on the Western Slope. Their studies have examined the potential of conserved water though deficit irrigation in basins along the Western

Slope. But how to shepherd the water to the receiving end is still an unresolved quandary.

Funding plan. A plan for seeking a steady and reliable source of funding external to individual transactions, to pay for statewide and community benefits of preserving irrigated agriculture in view of need for additional water supplies for urban and environmental purposes. Here are points made on this issue:

- In order to move forward with these or similar recommendations, new sources of funding will have to be secured. Unless a new source of funding is established, future efforts will have to rely on a conglomeration of funds from local open space programs, non-profits, federal and state programs, and private foundations. Irrigators need to be fairly compensated for their water, but municipalities cannot bear the burden of these costs alone. Municipal water providers cannot justify the costs of ATMs to their constituents, especially since it is not always the most cost effective way to secure water supplies. Avoiding a compact call and mitigating the effects of drought is a statewide benefit. Therefore, state or federal funding would have to contribute a significant amount.
- Unfortunately, the state of Colorado does not have enough funds allocated to address the issue. Water projects in Colorado have relied on severance taxes. The severance tax forecast is at an all-time low. However, CWCB has $25M available, $10M for ATM projects.
- For the immediate future, there are four active Basin Roundtables on the Western Slope that could provide funding for this mission until a more long-term source of funds is acquired.
- There are also possible sources of federal funding. The current federal appropriations bill has an additional $5 million allocated for the 2017 year of the System Conservation Pilot Project. There is another proposal that allocated $50 million for Western Water over multiple years. The Bureau of Reclamation is expected to soon announce a WaterSMART grant program that funds starting or expanding a water market or water market transactions. Adopting the means by which ATMs can go forward may well fit may fit well with the scope of this grant.
- For ATMs to be feasible, we may need some infusion of funds from external sources, such as communities who value benefits of agriculture for the good of the whole.
- Price should not be based only on the commodity that the water could have produced, but should include all the other values associated with agricultural production in rural communities. Large-scale participation in water conservation on Colorado's west slope will impact local communities. Industries that supply services for agriculture, laborers, and recreation can all be negatively affected by decreased agricultural activity. In the Upper Basin, the majority of irrigated agriculture goes to feed livestock. If leasing water results in less forage, irrigators would either have to reduce herd size or find suitable pasture. Solutions will affect not just the producer but buyers and communities.

- The secondary values of agricultural production (aesthetic, environmental, social) may be difficult to quantify, but should be taken into account. When thinking about other successful agricultural conservation projects like the Fallowing and Forbearance Program in Palo Verde California, it is important to remember that many landowners don't live in the valley and are less affected by the community impacts of fallowing than might be the case in upper basin states. Another issue is that unlike the Palo Verde Valley, Western Colorado is a tourist destination that benefits from the aesthetic of agriculture and irrigation. Changing irrigation methods or not irrigating at all later in the season could impact return flows, which are relied upon for the recreation industry on the Western Slope. Another significant issue could be endangered animal species like the Gunnison Sage Grouse. Drying up hayfields could negatively affect their habitat and effectively prevent any conservation measures.
- To mitigate impacts of large-scale conservation programs to the local economy, one option is to set aside some percentage of a water transfer as a surcharge. This money could be used to alleviate the impact of limited agricultural productivity on supplies, laborers, and other secondary industries. The money could also be used to address environmental issues that arise from reduced irrigation.
- We need something like a "GoCo" for water so that we don't have to patch together a lot of different funding sources for Ag to environmental ATMs.

Use it or Lose it clarification. A plan for a statewide, aggressive campaign to change misperceptions about use it or lose it, including, if necessary, statutory clarification, such that new behavior will be adopted that maximizes diverted water to productive use in all basins across the state.

The Colorado Water Institute, working with the State Engineer's Office, convened a group of legal, agricultural and environmental stakeholders to look into what is fact and what is misperception in regard to the oft-cited concern of "use it or lose it." Out of this effort came CWI Special Report 25, How Diversion and Beneficial Use of Water Affect the Value and Measure of a Water Right: Is "Use It or Lose It" an Absolute? Several subsequent presentations across the state have increased understanding, but most believe the work has just begun.

Point made on this topic include:

- Among irrigators, the perception of "Use It or Lose It" is still a barrier to participating in leasing water for other beneficial uses. It is hard for people to believe that participating in a conservation program will not negatively impact their water right, despite what Colorado's Division of Water Resources says.
- Misconceptions about water law are also prevalent amongst government employees in the Division of Water Resources and attorneys. Even a good attorney would tell an irrigator, "When in doubt, divert more." Administrative consistency in the State Engineers office is needed.

- We may need a statutory clarification of “use it or lose it” to take away misunderstanding and fears.
- We need to improve the basic education of state water resources employees in regard to issues such as “use it or lose it.”

Maximization of agricultural irrigation efficiency. Draft of a comprehensive statewide plan to maximize system-wide agricultural irrigation efficiency throughout the state, including plans to leverage funds available from a variety of sources.

Many people and the popular press express the belief that increasing irrigation efficiency is the answer for water shortages in the Colorado River Basin. Many think that if irrigators just switched from flood irrigation to center-pivot sprinklers or drip irrigation, there would be significant water savings. It is true that as irrigation efficiency increases, diversions often decrease. However, consumptive use of the crops also increases in many cases, especially if the crop was historically short of water and the efficiency allows more even coverage. If the goal of irrigation efficiency projects is to “fill” Lake Powell or add water to an over-appropriated stream, such projects may actually be counter-productive.

Some points made on this topic include:

- Some older systems on the Western Slope lose upwards of 30-35 percent of their diversion water from evaporation and seepage. Irrigation efficiency improvements could provide some real potential savings, but the cost can be upwards of hundreds of millions of dollars for a large system. These “savings” could translate into better system timing and efficiency, but not necessarily conserved water. The potential to improve a system may be very expensive and gains might not be cost effective.
- We need to integrate off-farm and on-farm efficiency projects and promote pressurized on-farm irrigation systems where possible
- How can we incentivize irrigation efficiency at the system scale?
- One incentive to convince Ag producers and ditch companies to invest in irrigation efficiency improvements is to protect ag water from the pressure of other uses by being able to prove that you are using the water most efficiently, not wasting any.
- Some may prefer to think in terms of “improving water management for multiple beneficiaries, including agriculture, local communities, and the environment.”
- The BOR Next Steps report says that flexible water management will benefit not only ag but other sectors— “a useful tool in building water supply resiliency for ag users in the basin in addition to facilitating multiple purpose solutions.”
- If system efficiency improves, you are getting elimination of non-beneficial consumptive use. You can’t claim it for transfer to other uses, but it does improve the water supply in the system. If you can’t claim it, you don’t have to worry about shepherding it. But maybe Powell sees a bit of benefit. And nobody is harmed.

- The impacts of irrigation efficiency improvements on consumptive use depends on if it's a water adequate system or not, and other particularities.
- Improving efficiency will look different in different places, since other goals may be in play, such as maintaining wetland habitat.
- If it's worth the cost is a question for some.
- We need to start thinking about our collective responsibility for the whole ecological system, not just our own personal benefit.
- We should track success of incentivized irrigation efficiency projects.
- For a project to be funded, we should require that the recipients have a plan for diverting only what they consumptively use. Work towards diverting only what the crop needs at the time it needs it.
- Improved irrigation systems may eliminate canal seepage or runoff, but often "inefficiencies" serve environmental purposes and provide water for wetlands and animal habitat. Depending on the area, seepage water can be claimed by other irrigators, making lining canals problematic in some areas due to injury or downstream users.
- There are risks and draw backs to irrigation efficiency, but such improvements used appropriately can be a tool to conserve water for other uses. The Gunnison Basin has undergone extensive canal piping and irrigation system upgrades through salinity reduction programs by the BOR and NRCS. These improvements are capable of reduced water consumption related to non-crop consumptive use and evaporation. It is important to keep in mind that these reductions are also permanent. Such improvements also take away water from non-crop plants that may provide habitat and aesthetic value, but these tradeoffs may have to be made or may be appropriate depending on the situation.

Multi-purpose storage and infrastructure. A plan developed in one basin as a pilot to demonstrate how multi-purpose storage and infrastructure—new and/or retrofit—can be used to bank water made available through ATMs.

Points made on this topic include:

- We should consider storage and infrastructure to facilitate ATMs.
- We can upgrade canals to conserve water on a full system—to serve as "within system storage."
- We can put water in pipes and use canals for storm water conveyance in partnership with cities.
- Store 'saved water' in upstream or district/federally owned reservoirs pursuant to new policy to enable non-project water storage without typical O&M costs
- We need to find partners in all sectors to get behind building multiple benefit storage to bank water saved through irrigation efficiency improvements.
- We could even "consider ATMs as a significant water supply project needing infrastructure."

- Infrastructure and storage are critical for ATMs to play a substantial role in meeting future supply gaps. We need to investigate what infrastructure is required in various regions and how can these infrastructure needs be met.
- The South Platte is heavily focused on obtaining the ability to better manage its water supply with additional storage and, potentially, infrastructure that would enable movement of water from the Lower South Platte to the heavily populated Middle South Platte area. There are also other demands for infrastructure, including improvements in irrigation facilities.
- As discussed in the Colorado Water Plan, there is ongoing concern that the permitting processes needed to allow construction of water management facilities are too time consuming, unnecessarily cumbersome, and expensive. While there is hope that the LEAN process may address this, it awaits its first test. What more can be done?