# The Water Report™

Water Rights, Water Quality & Water Solutions in the West


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## WAR AND PEACE OVER THE NIOBRARA RIVER

by Don Blankenau, Blankenau Wilmoth Jarecke LLP, (Lincoln, NE)

"The strongest of all warriors are these two — Time and Patience." Leo Tolstoy

### Introduction

On September 10, 2015, three Nebraska political subdivisions announced they had reached agreement on the transfer of the controlling water rights to the Niobrara River in northern Nebraska. This agreement effectively paves the way for a dramatic shift in water management in that basin. The water rights at issue command virtually the entire flow of the Niobrara River for hydropower production at a "run-of-the-river" facility (i.e., no water storage is involved), owned by the Nebraska Public Power District (NPPD). The agreement sets out a roadmap for the transfer and transformation of those hydropower rights from NPPD to the Niobrara River Basin Alliance (NRBA), which is a coalition of Natural Resources Districts (NRDs) and the Nebraska Game and Parks Commission (Commission). Under Nebraska law, NRDs are political subdivisions of the state, governed by locally elected boards. NRDs possess a broad range of powers for the management of natural resources but most importantly, hold primary responsibility for the management and protection of groundwater (*see* Kelly, *TWR* #81).

Pursuant to the agreement, the hydropower rights and associated property will change ownership and then — provided essential legislation is passed by the Nebraska Legislature — the rights will be transformed into multi-purpose rights for instream environmental, recreational, and basin-management. While the conceptual mechanics of this transformation are not complicated, the labyrinth of legal and political issues involved made reaching the agreement a convoluted eight-year process, which began in 2007 with a "call" for administration. (A "call" for administration is at the core of the Prior Appropriation Doctrine. A "call" is simply a formal request by the appropriator to the Nebraska Department of Natural Resources (NDNR) to regulate upstream water users on the basis of their priority dates so that NPPD would receive its senior rights. NDNR typically issues hundreds of closing notices to surface water users each summer in response to "calls" placed by senior water users).

### The Niobrara River Basin

The Niobrara River Basin drains 11,580 square miles, beginning its flow in eastern Wyoming as a small stream. The Niobrara River enters Nebraska at its northwestern border and flows over 400 miles eastward across northern Nebraska until it empties into the Missouri River in northeast Nebraska near the town of Niobrara. The area through which the river flows is largely rangeland, dominated by cattle production with little irrigation. Although sparsely populated with fewer than 30,000 people, the river is a popular recreation destination. Visitors number over 60,000 annually, there to enjoy floating and fishing, as well as golfing and hunting.

## Niobrara Agreements

### Hydrology

### Wild & Scenic Reach

### Hydropower Rights

### Single "Call"

### Water Availability

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Hydrologically, the Niobrara's flows are dominated by baseflow discharge derived from the river's down-cutting deep into, and even under, the High Plains Aquifer system. Much of the discharge occurs from the cliffs and hills above the river, resulting in unique groundwater generated waterfalls. This steady and stable discharge from the nation's largest aquifer makes the Niobrara a consistently gaining stream with one of the most reliable flow regimes in the country. Average annual discharge near the confluence with the Missouri River is 1,720 cubic feet per second (cfs). Since the 1960s the total annual flow of the Niobrara has been slowly increasing despite modest development for irrigation and other uses. Hydrologists suggest slightly higher precipitation is the reason for the increased flow but the author is not aware of any scientific study that supports that conclusion.

Near the town of Valentine, Nebraska, and flowing eastward, a 76-mile stretch of the river begins that was designated as "Wild & Scenic" by Congress in 1991. Although the designation is largely on private land, the US Park Service holds limited management authority through most of the designated area. The Wild & Scenic designation includes a nine-mile section that flows through the Niobrara National Wildlife Refuge, which was created in 1912 from the remnants of the Fort Niobrara Military Reservation established in 1879. The US Fish & Wildlife Service manages this stretch of the Niobrara.

**Spencer Hydro: The Conflict's Epicenter**

Approximately 40 miles upstream from the Niobrara's confluence with the Missouri River, the Spencer Hydro Facility (Facility) spans the Niobrara. The Facility, situated in Boyd County, consists of the 18-foot, run-of-the-river dam and small hydropower turbines with a combined generation capacity of 3,000 kilowatts per hour. The Facility was constructed in the 1920s. Over a period of some 20 years the Facility acquired three water appropriations totaling 2,035 cfs, to provide power to the turbines.

While the Facility has operated on a relatively continuous basis since its construction, prior to 2007 its owners "called" for water administration only a single time back in the 1940s. The call was made to the Nebraska Department of Roads and Irrigation, the agency then charged with priority administration. That call for administration was denied by the agency without much elaboration and no further calls for administration were placed until 2007. This failure to call for administration since the 1940s, even during times when the flow of the river remained below 2,035 cfs for extended periods, set the stage for conflict.

Although the Facility's water rights claim more than the average annual flow of the Niobrara, the absence of calls for water administration led NDNR, the state agency now charged with the duty to administer appropriations, to conclude there was ample unappropriated water for additional users. In effect, NDNR evaluated available unappropriated water not based on the total amount of appropriations that had been granted and the actual streamflow, but on the flows demanded by calls for administration. Accordingly, if an appropriator was not calling for water administration, the water rights of that party would not be considered in evaluating whether unappropriated water was available for additional uses by prospective new appropriators.

Relying on NDNR's assessments of available water, applications for new water rights continued to be filed and, over a period of 60 years, NDNR granted some 400 junior appropriations, primarily for surface water irrigation. Most of these appropriations were small, less than five cfs, but there were also substantial appropriations granted to the federal Bureau of Reclamation (Reclamation). The appropriations granted to Reclamation were associated with two relatively large dams and reservoirs constructed in the late 1940s and early 1960s, located upstream of the Facility with a combined storage capacity of nearly 100,000 acre-feet. These reservoirs provide irrigation water to over 40,000 acres. Interestingly, although holding junior appropriations, Reclamation entered into subordination agreements with the Facility's prior owner

Spencer Hydro Facility

 

## Niobrara Agreements

**Subordination**

**Groundwater Use**

**Closing Notices**

**Forfeiture**

**"Futile Call"**

**Agency Authority**

to allow it to operate in the event of a call — which, as already noted, never happened until 2007. The subordination agreements allowed Reclamation to pay in electric power to the Facility owner rather than in dollars. These subordination agreements would later become an important factor in the conflicts and their resolution.

In addition to the surface water uses, an estimated 3,000 wells were installed within the Niobrara Basin over the same period for crop irrigation, golf course turf, livestock, and domestic uses. All of these ground and surface water uses continued and grew without interruption over decades. As late as 2006, the NDNR made a formal analysis concluding that at the then-present rates of development, ample unappropriated water would be available at least 20 years into the future.

### Water Administration And Picking Fights

NDNR's position on unappropriated water changed abruptly on a morning in May of 2007 when NPPD realized that it had not called for water administration since the 1940s. With flows below 1,900 cfs, and oddly at the suggestion of NDNR's director, NPPD staff sent a request to NDNR calling for water administration. Without a hearing or written warning, NDNR staff quickly verified the flows at the Facility and, upon confirmation that the flows were below 2,035 cfs, issued closing notices to the 400 upstream junior surface water users. Most of those junior irrigators had already obtained operation loans and planted crops with the expectation of irrigating through the coming summer months. The public outcry to the surprise issuance of the closing notices was shrill and quickly followed by a series of three separate suits brought on behalf of multiple landowners, challenging the validity of NDNR's action to administer for NPPD's appropriations. The legal theories behind the suits varied but only one survived a motion to dismiss.

The suit that survived the motions to dismiss was brought by two unaffiliated landowners who had small appropriations approximately 145 miles upstream of the Facility. The case was captioned, *In Re 2007 Administration of Niobrara River (*due to multiple appeals explained below, the case has multiple citations as follows: 278 Neb. 137, 768 N.W.2d 420 (2009); 283 Neb. 629, 820 N.W.2d 44 (2012); and 288 Neb. 497, 851 N.W.2d 640 (2014)). In the case, the landowner plaintiffs sought an administrative hearing before NDNR to present evidence and argument regarding multiple issues, including the following: (1) that NPPD had abandoned or forfeited, in whole or in part, its right to call for administration by failing to seek administration in the preceding 65 years; (2) that NDNR had used an incorrect flow demand at the Facility by failing to subtract the flow associated with any subordinated rights from 2,035 cfs before issuing the closing notices; and (3) that NDNR failed to conduct a proper "futile call" analysis for water users located over 145 miles upstream before issuing closing notices. A "futile call" exists when it is determined that regulation of upstream junior water users will not actually result in water being made available for the senior right's use. When that is the case, the upstream junior users are *not* required to shut off their water diversions.

Under Nebraska law, appropriators may request an administrative hearing before NDNR's Director to review actions taken by that agency. Appeals from a final order of NDNR's Director are taken directly to the Nebraska Court of Appeals but may be bypassed from that court to the Nebraska Supreme Court upon the discretion of the Supreme Court. As a practical matter, the Nebraska Supreme Court almost always takes cases involving water *sua sponte* (an action by the court taken without a prior motion or request from the parties). As the administrative action by the landowners percolated before NDNR, the same landowners launched a stopgap measure in the county court.


 

**Niobrara Agreements**

**"Preference" & Compensation**

**Subordination Offer**

**"Just Compensation"**

**Valve Dispute**

**Closing Issues Appeal**

**Availability Determination**

**Now A Two Front War**

Under Nebraska's State Constitution, as with most western states, agricultural uses enjoy a "preference" of use over manufacturing uses. This preference of use allows persons holding junior agricultural appropriations to take water out-of-priority upon payment of compensation to the manufacturing senior appropriator. Ordinarily this provision is exercised contractually through subordination agreements between the competing users but absent agreement, judicially imposed compulsory subordination is an option. Nebraska's statutes further animate this constitutional provision by setting forth the process by which a price for compensation is established and the procedure to affect the preference in the event the parties are unable to come to terms for a subordination agreement.

To ease the unrest in the Niobrara River Basin following the issuance of the closing notices, NPPD wisely offered an annual subordination agreement to all junior agricultural appropriators in the Basin. The agreements however, contained a provision that arguably waived all rights to contest any aspect of NPPD's appropriations in the future. These proposed agreements also left open to speculation the likely cost of water for future years. The waiver and price provisions were objectionable to the two plaintiff landowners who also desired long-term agreements at predictable pricing. Unable to come to terms and knowing that the hearing before NDNR would take time and an appeal would be likely, the landowners in *In re 2007 Administration* initiated an action in the Boyd County Court to exercise their State Constitutional preference rights.

Nebraska Revised Statutes §70-669 requires the "just compensation" to be paid for exercising a preference over hydropower, to not be greater "than the cost of replacing the power which would be generated...by the water so acquired." Accordingly the landowners argued that the appropriate compensation for the exercise of the preference would be the wholesale rate of the power that would be generated by the water they intended to consume. To determine what that amount would be, the Plaintiffs used NPPD's historical records. Using the record annual high production of hydropower for the Facility and dividing that production by the annual flow of the River for that same year, revealed a power production of .010 **M**egawatt **h**ours (Mwh) per acre-foot of water. NPPD's wholesale price for power in 2007 was $38.00 per Mwh so the cost per acre-foot of water would be a mere 38 cents under this theory. Because the Plaintiffs desired a 20-year subordination, they then discounted the price to the present value, further reducing the anticipated value of the power to NPPD.

The Board of Appraisers appointed by the county court to determine the appropriate value to be paid to NPPD, came back with a price of approximately 50 cents/acre-foot but without explanation as to how they arrived at that price. The award was well below what NPPD had sought although the methodology used by NPPD was never revealed. Because the award was less than desired, NPPD appealed the award to the district court. The appeal process is a *de novo* adjudication of the issues rather than a review of the record before the Board of Appraisers. (Under a *de novo* adjudication, the issues are decided anew, without reference to the legal conclusions or assumptions made by the previous authority that heard the case).

The landowners responded to the appeal with a motion to the district court to stay that appeal pending a final resolution of the issues before NDNR. The landowners argued, and the district court agreed, that until the validity of NPPD's appropriations and the propriety of the closing notices were determined by NDNR and the Nebraska Court of Appeals, no final value could be determined by the district court. Accordingly the motion to stay was granted and the case was stayed indefinitely. During the stay, however, the landowners were allowed to begin using water for irrigation immediately and out of priority.

**NDNR's Response to the Preference Action**

Upon completion of the preference action before the county court, NDNR suddenly dismissed the landowner's action before it. In dismissing the administrative action, NDNR's Director concluded that since a preference action was successfully executed, the landowners were no longer subject to closing notices and their claims had been mooted. The landowners appealed the dismissal arguing that they could maintain multiple challenges, and if successful before the agency, would be entitled to take water without having to pay NPPD any compensation. As is usual with cases involving water, the appeal bypassed the Court of Appeals and was taken up by the Nebraska Supreme Court. Following argument, the Supreme Court issued an order on July 17, 2009 ruling for the landowners and reversing the decision of the NDNR. *See In re Administration of Appropriations of the Waters of the Niobrara River*, 278 Neb. 137, 768 N.W.2d 420 (2009). Accordingly, the case was remanded to NDNR to address the substantive issues raised by the landowners.

**Basin Declared Fully-Appropriated and Then Not . . .**

As the landowner cases proceeded, NDNR issued a separate order at the end of 2007 making a preliminary determination that the entire Niobrara River Basin was "fully-appropriated" as a result of NPPD's call for administration. Under Nebraska law, NDNR is required to conduct an annual evaluation of the expected long-term availability of hydrologically connected surface water and groundwater to ensure adequate flows are available for the most junior surface water appropriator within the area of the evaluation. Not surprisingly, NDNR followed its preliminary determination with a final order finding the

## Niobrara Agreements

**Permits Moratorium**

**Availability Appeal**

**Analysis Errors**

**Availability Decision Rejected**

**NDNR Error**

**Third Ruling: Forfeiture Subordination Demand**

**Instream Flow**

Niobrara Basin to be fully-appropriated later in 2008. Under Nebraska law, a "fully-appropriated" basin is immediately subject to a moratorium on the issuance of new surface water appropriations and on the construction of new wells within the area designated as being hydrologically connected — which in this case extended, in some areas, over 50 miles from the Niobrara and each of its tributaries. In addition, the designation requires the NDNR and each of the Natural Resources Districts (NRDs) within the designated basin, to jointly develop an "**i**ntegrated **m**anagement **p**lan" (IMP). The IMP provides a roadmap for future water use and development, and may identify the regulatory measures that can be utilized to meet the management objectives of the IMP.

On February 8, 2008, faced with previously unforeseen and potentially costly regulatory measures, some of the NRDs members of the NRBA initiated a challenge to the validity of the fully-appropriated designation. Pursuant to statute, that challenge began as an administrative action before the agency that made the designation — NDNR, and was captioned as *Middle Niobrara Natural Resources District et al., v. Department of Natural Resources*.

In the administrative proceeding, the NRDs argued numerous errors in NDNR's analysis including: (1) the fully-appropriated designation was premature until the validity of NPPD's rights were resolved through the landowner action in, *In re 2007 Administration of the Waters of the Niobrara River*; (2) NDNR could not declare a basin to be fully-appropriated when the calling right was always subject to subordination under Nebraska preference laws; (3) NDNR used an improper flow demand when it analyzed the flow available to junior users because it disregarded all flows to which NPPD had already agreed to subordinate; (4) NDNR's analysis was flawed because those results could not be replicated as required by statute; and (5) NDNR's analysis was flawed because it failed to use the best available data and information.

A hearing was conducted in the summer of 2009, largely on stipulated facts. On December 17, 2009, NDNR's Director issued a 13-page order holding against the NRDs on all counts. The NRDs appealed the decision to the Nebraska Court of Appeals and then quickly petitioned to bypass the Court of Appeals to the Nebraska Supreme Court. The petition was granted and the case argued to the state Supreme Court (Court or Supreme Court) on September 2, 2010. Although the Court had historically issued orders within three months of argument, its opinion in this case was not issued until June 3, 2011 — some nine months after argument. In its 17-page opinion, the Court found the methodologies employed by NDNR to be flawed and ruled in favor of the NRDs, thereby invalidating the fully-appropriated designation. *See Middle Niobrara Natural Resources District et al., v. NDNR*, 281 Neb. 634, 799 N.W.2d 305 (2011).

### Back to the Landowners — Supreme Court Rules a Third Time

Although the NRDs were pleased with the victory, they understood that the victory would be short-lived if the Nebraska Supreme Court ruled against the landowners in, *In re 2007 Administration of the Waters of the Niobrara River*. After finally obtaining a hearing before NDNR following the remand, the NDNR Director issued his order on December 20, 2010 finding against the landowners generally and declining to determine the validity of NPPD's appropriations citing a lack of evidence, and avoided many of the remaining issues. The landowners again appealed the agency decision, which because of the prior decision in the same case, went directly to the state Supreme Court.

In an opinion issued on April 13, 2012, the Court held that the NDNR erred in refusing to determine the validity of NPPD's appropriations and remanded the case to NDNR yet again for further proceedings. *See In re 2007 Administration of Appropriations of the Waters of the Niobrara River*, 283 Neb. 629, 820 N.W.2d 44 (2012).

On the second remand to NDNR, the parties agreed to a limited proceeding largely on the record of the prior proceedings in the hope that the next trip to the Supreme Court would be expedited. Not surprisingly to the landowners, NDNR ruled yet again against them on all counts and the third journey to the Court began.

In its third and final opinion in the matter, the Court, in a split opinion, deferred to the NDNR's factual determination to hold that NPPD had not abandoned or forfeited its rights for failing to call for administration. More interestingly, the Court held that NPPD could enter into subordination agreements, as it had with Reclamation and other water users, and still demand the full measure of its appropriations. In other words, it could subordinate and obtain payment for water being taking out of priority, but still demand the full 2,035 cfs from the remaining water appropriators. This decision highlighted the exceptional power of NPPD's appropriations and ensured that NDNR would again declare the Basin to be fully-appropriated in the near future. *See In re Administration of Appropriations of the Waters of the Niobrara River*, 288 Neb. 497, 851 N.W.2d 640 (2014).

### Enter the Fish, Wildlife, and Recreation Concerns to the Fray

While the administrative and appellate battles raged, the Nebraska Game & Parks Commission (Commission) engaged in a variety of studies to evaluate what flows could protect fish, wildlife, and recreation interests found above and below the Facility. The Commission conducted these studies in the event it wished to pursue an instream flow appropriation before NDNR. Pursuant to Nebraska law, an instream flow appropriation is treated like all other appropriations and will not be granted unless there is

 

## Niobrara Agreements

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unappropriated water available. While there was virtually no unappropriated water above the Facility so long as NPPD's appropriations remained valid, those flows immediately became largely unappropriated after passing the Facility, and ripe for application and appropriation at that point. The Commission's studies and interest did not go unnoticed by the NRBA members.

During this period, the US Park Service became more vocal in expressing an interest in pursuing claims of a federal reserved water right for the Wild & Scenic designation. Whether such a claim would be valid in light of the NPPD appropriations being senior to the designation and given that the designation occurred on lands largely privately held is open to question — but the potential disruptive nature of such a claim itself caught the attention of the NRBA.

### A Path to Peace . . . Perhaps

Faced with a likely fully-appropriated Basin requiring extensive management, rights to virtually all of the flows being held by a single party, and a growing interest in additional claims by state and federal agencies, NRBA members began to consider ways by which all concerned parties could protect their interests.

The solution was not hard to identify, but politically complicated:

- Acquire NPPD's appropriations jointly with the Commission
- Dedicate a portion of the flows necessary to protect fish, wildlife, and recreation interests
- Retain the remainder for future basin management flexibility

By taking ownership of NPPD's appropriations, the NRBA and the Commission could protect legitimate state interests and still allow local water managers to meet their water management obligations in a cost effective way. To be successful, the NPPD appropriations (water rights) would need to retain their original priority dates and all existing appropriators would need to be protected. The problems were: (1) how to first convince the Commission to join forces; and (2) how to convince NPPD, the adversary in the long and often heated litigation, to sell its appropriations.

NRBA first approached the Commission with its idea in the fall of 2014, following the Supreme Court's last opinion. After the second meeting, the value of the idea became clear to the Commission representatives and the parties agreed to approach NPPD. NPPD's management, like the Commission, warmed quickly to the idea — but with one twist. NPPD didn't want to part with just its appropriations — it wanted to sell the entire Facility. Neither the NRBA nor the Commission was particularly interested in acquisition of the property but faced with no other options, they ultimately agreed. Under the terms of the September 10 agreement, the price for the appropriations and Facility was set at $12,000,000 with $3,000,000 being donated by NPPD. The remaining $9,000,000 would be raised through a combination of grant funds and locally levied property taxes.

Under Nebraska law, an appropriation (water right) cannot be changed from one type of use within a preference category to a different preference category. In this case, to fully implement the agreement, such a change would be necessary. To address that issue, the September 10 agreement is contingent upon a legislative change that will allow an appropriator to convert an existing appropriation for the production of hydropower into a multi-purpose appropriation for recreation, fish, and wildlife habitat, and basin management. The legislation will allow the converted right to retain the original priority date/s but will treat the newly created appropriation as if the preference category had not changed. This will require an express provision for payment of any future subordination agreements to be based on the existing price with an adjustment keyed to the consumer price index. Finally, to avoid any harm to existing water users, the legislation will require the NRBA and Commission to enter into new subordination agreements with all parties who currently have subordination agreements with NPPD, at no added cost to the junior appropriator. This will ensure those appropriators who have entered into agreements and made investments to continue to be able to make beneficial use of the water without any new or added expense.

The duration of the September 10 agreement is for two years. Within that period the parties must raise the necessary funds and convince the Nebraska Unicameral to adopt the legislation. While the parties can extend the initial period, they hope to conclude their efforts as early as the fall of 2016. Nebraska's one-house Unicameral begins its next session in January of 2016.

### CONCLUSION

If the terms of the agreement are fully met and the transaction successfully concluded, all existing water users should be assured of water into the foreseeable future. Of equal importance, the flow of the Niobrara River will be managed with the long-term objectives to provide the vital protection for recreation, fish, and wildlife, and the people who live and work within the Basin. Peace at last.

**For Additional Information:**
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September 10 Agreement available upon request to TWR: TheWaterReport@yahoo.com

# INNOVATIVE WATER MANAGEMENT

NEW TOOLS FOR SECURING WATER FOR PEOPLE AND NATURE

by Aaron Derwingson, Agricultural Coordinator, The Nature Conservancy, Colorado River Program

**Management Innovations**

**Increasing Demands**

**Colorado River Use**

**Achievable Security**

**Tools**

## INTRODUCTION

The news is full of stories about the ongoing drought in the Colorado River Basin. How we rise to the challenge of meeting increasing demands for fresh water in the one of the driest and fastest growing areas in the country will have profound consequences for the region's future.

The Nature Conservancy (Conservancy), a non-profit, science-based conservation organization, works to conserve nature and the value it provides to people, while helping the world meet demands for food, water, and energy. Throughout the Colorado River Basin, the Conservancy and our partners are pursuing innovative strategies that will help meet society's water needs while protecting and restoring the rivers and streams that sustain both nature and people.

Widely considered the "hardest working river in the West," the Colorado River and its tributaries provide drinking water for more than 35 million people, irrigate approximately 5.5 million acres of agricultural land, provide 4,200 megawatts of hydropower generating capacity, and drive a $26 billion recreation economy (*References 1, 2, and 3,* below). All of this, however, is at risk as the river is already stretched to its breaking point. Basin-wide demand exceeds supply in many years, so much so that the Colorado is one of the few rivers in the world that no longer reaches the sea (Figure 1).

## WATER SECURITY

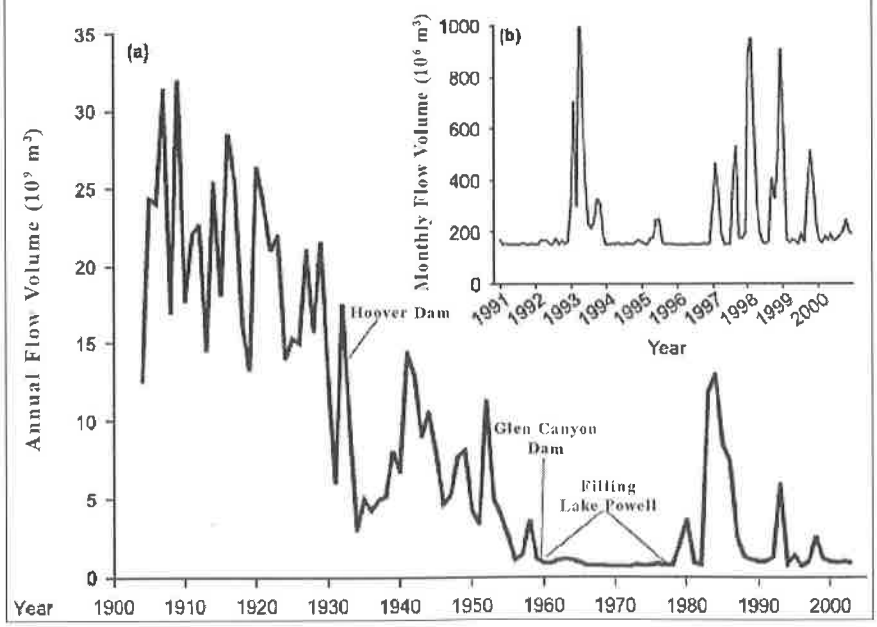
When considering the hard pressed water resources in the Colorado River Basin, "more water" most often tops water users' wish list — including those managing water for municipalities, industry, agriculture, and the environment. However, "water security" is the one thing all water users want that is actually achievable in the arid west.

Water security can be defined as knowing that the water will be there when you turn on your tap, when you need to irrigate your crop, or that it's there in the river when needed to support fisheries and important riparian habitat. It's about the right amount of water, in the right place, and at the right time. The challenge is that action taken by any one water user to secure water has implications for other users in the same system. Practical innovation means figuring out how we can achieve water security in a way that meets the needs of all users: communities, agriculture, and the environment.

Achieving water security in the future will involve using both new and existing tools — including the infrastructure, the institutions, and the science needed for flexible and equitable water management. It will also involve building the diverse partnerships needed to implement these tools on the ground.

This article presents water conservation efforts being conducted at different scales that showcase the tools and partners the Conservancy is working with to secure water for people and nature in the Colorado River Basin. Three case studies occurring at the farm, irrigation ditch, and community scales are covered. This is followed by a look at the entire Colorado River Basin, examining an effort by the US Bureau of Reclamation, municipal water providers, agricultural water users, and conservation organizations to develop a new water sharing tool to mitigate risks associated with ongoing drought.

**Figure 1: Colorado River Annual Flow below Yuma, AZ**




## SUPPLY & DEMAND

Water challenges in the Colorado Basin are rooted in both hydrology and governance. Figure 2 illustrates the very large year-to-year variation in the flow of the Colorado River at Lee's Ferry, Arizona. The river's annual discharge averages about 15 **m**illion **a**cre-**f**eet (MAF), but in recorded history discharge has ranged from 22 MAF in 1984 to less than 4 MAF in 2002 (*Reference 4*). It's clear that one of the primary water challenges is dealing with a highly variable system. Another primary challenge is that as the West developed, more water was allocated for use than is available on average. Under the 1922 Colorado River Compact, the Upper Basin (portions of Colorado, New Mexico, Utah, Wyoming, and Arizona) cannot deplete more than 7.5 MAF per year (MAF/YR) and the Lower Basin (portions of California, Arizona, Nevada, and

## Management Innovations

Streamflow

Demands Supply

Flexibility Issues

Water Efficiency Group

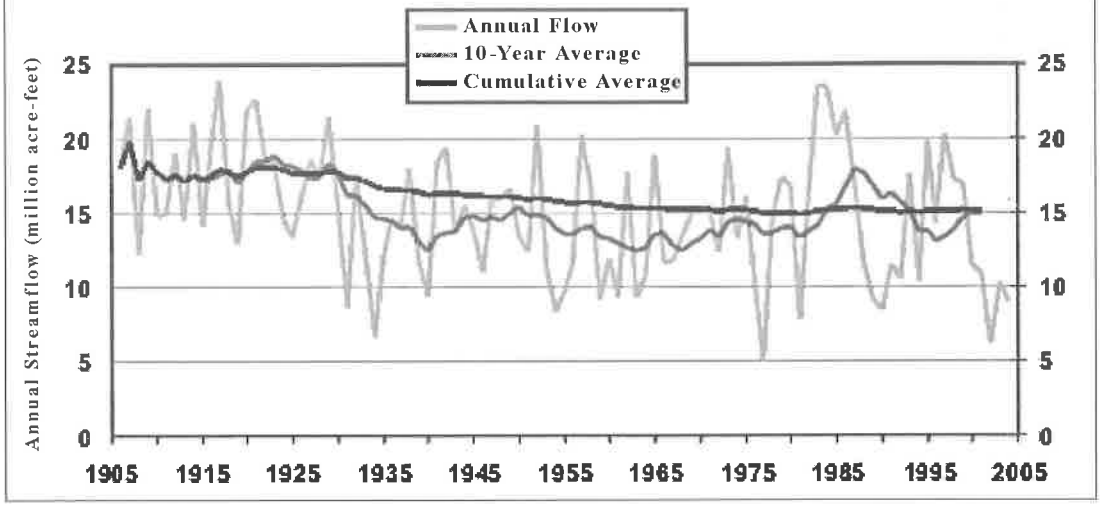
Irrigation Efficiency

CSU Participation

Technology Improvements

Utah) cannot deplete more than 8.5 MAF/YR. Under the 1944 Treaty with Mexico, the United States must deliver 1.5 MAF/YR to Mexico, unless there is an extraordinary drought. With the rare exception, since 1940 the 17.5 MAF/YR of total water allocated under these agreements has exceeded the amount of water actually available.

**Figure 2: Historic Annual Streamflow at Lee's Ferry, Arizona (treering.info)**




In about 2002, water demand outpaced supply, and for the first time we began using more water than is available on average. We've managed to get through dry periods without running out of water because we are capable of storing approximately 60 MAF of water in the Colorado River Basin. But with water demand projected to increase with population growth, and drought and climate change projected to increase water supply variability, how long can the trend of overuse continue without further impacts?

These issues are complicated by a water management system that does not provide the flexibility we need to be resilient in the face of these challenges. This system relies primarily on the permanent transfer of water from one use to another. It generally discourages conservation, temporary water-sharing agreements, and other means for reducing demand, increasing supply, and re-distributing water nimbly and equitably to meet critical social, economic, and ecological needs. This management regime has pitted water uses against one another in a zero sum game that has dewatered streams and dried up critical agricultural lands (*Reference 5*). We need to forge a new path in order to achieve water security for our communities, for agriculture and our food supply, and for the environment.

## CASE STUDIES: THREE STORIES AT THREE SCALES

### On the Farm: Building Partnerships and Improving Irrigation

John Harold is a farmer and community leader in Olathe, Colorado, who believes that he and his fellow producers need to take thoughtful and proactive steps to address water security issues and ensure the future of irrigated agriculture in his community. In 2013, John gathered a group to talk about what could be done. The result was No Chico Brush (NCB), a group of farmers, ranchers, conservation organizations, and others who have partnered to promote water supply efficiency in the Gunnison Basin. The name refers to the group's goal of preserving irrigated agriculture and not allowing native greasewood or "Chico brush" to take over the area's fields.

The group is organized around the simple vision of making the best possible use of water to sustain agricultural production while reducing impacts on soil and river health in the Gunnison Basin. John and NCB recognize that irrigation efficiency can benefit local farmers by improving crop yields and reducing operational costs. Efficient irrigation also provides benefits to all water users by improving water quality, stream flows, and overall system reliability.

As a critical first step, NCB partnered with Colorado State University (CSU) on a three-year field study to document and detail the benefits of improved on-farm irrigation efficiency and water management. Although similar research has been done elsewhere, it was essential for this group to have data from farm operations in their area. This ongoing study provides locally relevant data, builds support from participating producers, and demonstrates practices that neighboring producers can observe first-hand and then replicate on their own properties.

The study compares water use and crop yield between the traditional flood irrigation practiced by the vast majority of water users in the area and a number of improved irrigation technologies, including: overhead sprinklers; big gun sprinklers; and drip irrigation.

## Management Innovations

### Crop Consumption

### Crop Yield

### Soil Moisture

### Irrigation Customization

### Irrigation Infrastructure

### Automated Headgate

### Flow Target Payment

### Water Savings

Prior to the 2014 irrigation season, CSU placed equipment at each of the seven participating field locations to measure all aspects of water use, including: water applied; surface water runoff; and soil moisture at three different depths. A weather station supported by the Colorado Agricultural Meteorological Network (CoAgMet) is located on or very near each of the field sites to measure: air temperature; relative humidity; soil temperature; wind speed and direction; solar radiation; and precipitation. Researchers at CSU will use this information to calculate crop consumptive use. Comparing the water consumed to the water applied at each of the sites provides a measure of irrigation efficiency, as well as an estimate of potential water savings.

In addition to the water use calculations, CSU is working with the participating producers to measure crop yield and associated variables. Onion farmers, for example, are interested in both yield and size. This means measuring pounds of onions per acre as well as how many onions of each size (pre-pack, medium, jumbo, and colossal) are produced per acre under both flood and drip irrigation. Initial results from the 2014 season show that drip irrigation produced over 10,000 more pounds per acre than flood irrigation while saving approximately 12.5 inches of water per acre. These results are promising but preliminary, and we look forward to building on them with data coming in now from the 2015 field season and with additional data gathered in the upcoming 2016 field season.

To see the most benefit to agriculture and the environment from these irrigation system upgrades, John and NCB want to improve how producers irrigate. Working through a partnership with the Irrometer Company, NCB and CSU have installed soil moisture monitors at three different depths on all seven participating field sites. These monitors gather data continuously and transmit it to the producer through a secure website that can be accessed on a computer or smartphone. Producers then use this information to determine when, and how much, they should irrigate.

Improved irrigation infrastructure and soil moisture monitors are important tools for making better use of our water resources, but improving water security requires changing agricultural water use at a larger scale. Accomplishing this involves partnerships with people like John Harold and the other NCB farmers who will put these tools to use and inspire others to do so as well.

Irrigation efficiency alone won't solve our supply and demand problems in the Colorado River Basin, and it's important to emphasize that efficiency improvements need to be customized to the local situation on the ground. However, improving how agriculture uses and manages water can enhance water security for both agriculture and the environment by allowing farmers and ranchers to produce more crops per drop of water.

The main question, though, is what happens to those water savings created on farm by more efficient practices? To address that, we need to move up in scale from the farm to the ditch system that diverts and delivers irrigation water.

**At the Ditch: Meeting Agricultural and Environmental Goals**

Outside of Camp Verde, Arizona, the Diamond S Ditch Company (Diamond S) used to divert about 17 times more water from the Verde River than they actually needed for irrigation, dewatering the river for several miles downstream from the diversion. This inefficiency, and its unintended consequences for native fish, had a readily identifiable cause: outdated infrastructure. Adjusting the diversion volume required a time-consuming, cost-ineffective, trip to the headgate by the ditch boss. Because the headgate equipment was old and outdated, adjustment often required the ditch boss to literally jump up and down on the gate to get it to move, something that was both dangerous and not very effective.

In order to address the needs of the river and the ditch company, the Conservancy worked with the Diamond S to purchase and install a new headgate that automatically adjusts to keep a constant flow of water in the ditch. The headgate moves up or down as the river drops or rises, allowing unneeded water to stay in the river. The Conservancy and the Diamond S also installed equipment that allows for remote adjustment of the headgate from a computer or smartphone.

The automated headgate and remote control were critical technical tools for this project, but the partnership with the Diamond S was absolutely vital for the on-the-ground management needed to achieve agricultural and environmental benefit. The Diamond S had concerns about whether or not they could operate their ditch with less water. To address these concerns, the Conservancy set up a three-year contract that would pay Diamond S if they could meet a specific flow target in the ditch. This flow target was a separate issue from construction of the new headgate and there was no penalty if the target was not met. The flow target and contract provided an additional incentive for the Diamond S to learn how to manage their system with less water — and Diamond S has met the target each year. The end result of this cooperative project is a ditch company that is able to provide reliable water supplies to their producers while restoring flows to over five miles of the Verde River.

For the Diamond S, this project also showed the benefit of addressing water security — for the ditch company as well as the environment — as a means to improve their system. The concept of increasing efficiency, either on the farm or in the ditch, and keeping water savings in the river has potential applications throughout the Colorado River Basin, although it has some significant legal barriers.

## Management Innovations

An example from Oregon illustrates an option for encouraging water conservation by allowing the use of water savings. Under Oregon water law, a statute allows agricultural water users to implement efficiency improvements and then utilize the water savings achieved to irrigate additional lands, plus protect a portion of the water savings for instream uses (*see sidebar & Reference 6*). This has helped create an incentive to improve irrigation systems, and conservation groups and others are investing in these improvements for both the agricultural and environmental benefits. Similar legislation has twice been introduced in Colorado. Although it ultimately failed each time, it has advanced the conservation discussion and helped address critical questions concerning: the nature of a water right; the control a water user has over the non-consumptive portion; and how a program to protect efficiency savings instream could work to avoid injuring other water users. Importantly, smaller pieces of legislation have passed that allow water users in Colorado to begin testing these concepts without risk to their water rights.

The important lesson to take away from both the Diamond S and No Chico Brush projects is that infrastructure improvements and other technical tools can enable a beneficial change in water management, but getting results on the ground also requires strong, committed partnerships. A crucial component of that commitment is ensuring that projects provide multiple benefits to members of the local community.

**OREGON'S CONSERVED WATER STATUTE**

The program enabled by Oregon's Conserved Water Statute provides water right holders that invest in conservation measures with the ability to create new water rights from their existing rights. Water saved can be "spread" to additional (or new) consumptive uses or to non-consumptive uses, including an instream use. The process of creating these new rights is called an "allocation of conserved water." By statute such allocations are the responsibility of the Oregon Water Resources Commission but are carried out in practice by the Oregon Water Resources Department (together generalized below as "the State"). Thus, the holder of an irrigation right for a certain number of acres can increase their water use efficiency and then develop a new right to use the saved water on additional acres. Likewise the water right holder could transfer their interest in the saved water to another party who could develop a new irrigation right or other out-of-stream water right. Alternatively the water right holder can ask the State to create a new instream water right with all or a portion of the conserved water. If the water is needed to support instream flows the State will create a new instream water right.

Principal statute provisions are paraphrased below:

- the application for conserved water must be filed within five years of the date the conservation measures were implemented (ORS 537.465(1)(b))
- when any allocation of conserved water is made, the State will retain at least 25% of the conserved water. If the State determines that this water is necessary to support in-stream flow purposes, the conserved water is converted to an in-stream water right (ORS 537.470(3))
- if more than 25% of the funds used to finance the conservation measures comes from federal or State public sources and is not subject to repayment, the percentage of water allocated to the State is equal to the percentage of public funds used to finance the conservation measures (ORS 537.470(3))
- despite the prior provision, the applicant may always choose to retain up to 25% of the conserved water (for example if the project is 100% funded by the public) (ORS 537.470(3))
- following completing of the allocation of conserved water new certificates are provided for the remaining portion of the originating right as well as new rights covering the allocated water (ORS 537.470(6))
- allocations of conserved water may retain the original priority date of the source water right or be assigned a priority date one minute later (ORS 537.485(1))
- the priority date assigned to the applicant's and State's portion of the allocation must be the same (ORS 537.485(2))
- allocations that are not assigned to the State may be leased to instream use pending a final allocation to another use (ORS 537.490(1)) and shall not be subject to forfeiture if so leased (ORS 537.500(1))

Aylward, pages 5-6 (*Reference 6*)

**In the Community:**

**Bringing Life Back to the River Through Groundwater Recharge**

A current project in the San Pedro River Basin in Arizona addresses municipal and environmental needs.

The San Pedro River rises in Mexico and flows north into Arizona where it joins the Gila River. It is one of the most biologically diverse regions in the American Southwest, supporting over 250 species of migratory birds. In addition to wildlife, the climate is also a major draw for people. Between 1960 and 2009, Cochise County nearly tripled in size, growing from around 55,000 to over 140,000 people. Over that same time period Sierra Vista, the largest incorporated community in the county, grew from just over 3,000 people to over 46,000 people (*Reference 7*). The area continues to grow today, placing more and more demand on the region's groundwater. Population growth is an issue for the communities in the area that need reliable water supplies. It is also an issue for the San Pedro River, which now goes dry at multiple locations as a result of groundwater pumping.

In the San Pedro River Basin, the Conservancy has been working with Federal, State, and local partners since 1999 on a community mapping project to identify the wet and dry areas of the river. The Conservancy is a science-based organization, meaning we rely on the best science available to both design and carry out our conservation goals. Now, with 16 years of data, this effort is informing our approach to securing water for people and nature in the San Pedro. We have used the maps and resulting trend data to identify key areas in which to prevent further pumping and identified the best locations for groundwater recharge facilities.

A central factor in any partnership is what motivates different entities to participate. In the San Pedro, cities, counties, and other local entities need reliable groundwater supplies but also want to support the environment that draws people to the area and provides for a high quality of life. The US Army, another essential partner, also needs reliable groundwater supplies and a buffer from development for their local Fort Huachuca base — the area's largest employer.

Using the science and analyses from community mapping and hydrologic modeling, the Conservancy worked with these primary partners to identify and acquire three sites, totaling around 5,000 acres along a critical 25-mile stretch of the San Pedro River. The first heavily monitored pilot groundwater recharge facility has been operational on one property for a year and is providing data to inform construction on the other two properties. The Conservancy also worked with the Army,

## Management Innovations

### Land Acquisition

which provided funding through the Compatible Use Buffer Program, to acquire three additional pieces of land surrounding Fort Huachuca. These aquisitions provided the important buffer from development that the Army needed, but also precluded future groundwater pumping in a sensitive area where additional water withdrawals would further draw down and damage the river. These sites can also be used for future groundwater recharge projects.

In this case, a science-based plan was a necessary first step. However, it cannot be over emphasized that it would not be possible to complete the project without a diverse network of partners who are committed to implementing the plan because it provides multiple community benefits, including water security.

### BASIN SCALE: WATER SECURITY FOR PEOPLE AND NATURE

At the scale of the entire Colorado River Basin, over-allocation of water resources combine with population growth, drought, climate change, and a rigid water management framework to put the entire Colorado River System at risk. How can tools and partnerships developed to meet local needs be scaled up to address basin-wide concerns about the reliability of water supplies for municipalities, agriculture, and the environment?

### Water Sharing

In order to build water security for people and nature in the Colorado River Basin, we must develop new institutions that facilitate water sharing and build the partnerships needed to support them. These partnerships must be founded on the understanding that all water users are at risk and that a water sharing program can only succeed if it addresses everyone's needs and concerns.

### Market Approach

**Colorado Water Bank Work Group: Water Banking**

In Colorado, the Conservancy is working with the Colorado River District, Southwest River District, Front Range Water Council, agricultural representatives, and other partners to explore the use of a water bank as a voluntary and compensated market approach to temporarily reduce consumptive uses in the Colorado River Basin in Colorado.

This Water Bank Work Group is focused on developing solutions that:

- strike a balance between urban, agricultural, and environmental needs
- avoid long-term agricultural dry up and water supply disruption on the West Slope of Colorado
- minimize risk for all Colorado River water users in the face of ongoing drought (*see sidebar,* below)

### Temporary Reductions Compensated (Insurance)

If the drought continues, and if no effective collaborative action is taken to mitigate the effects of the drought, every sector is at risk. To address this, the Water Bank Work Group (Work Group) envisions an insurance-like program in the event of extreme shortages that significantly affect Lake Powell's operations or the Upper Basin's ability to meet the Colorado River Compact obligations. This would involve a market-based approach that would compensate water users to temporarily reduce their use in times of severe drought and water shortages. To date, the Work Group has completed preliminary feasibility studies to evaluate the potential supply and demand for such an insurance program and determine how a program could work with the many different ditch companies and irrigation districts in Western Colorado. Currently, the Work Group is focused on evaluating feasibility for farmer and rancher participants and is involved in a five-year study with Colorado State University to investigate the water savings potential and agricultural impacts from reduced irrigation.

Like the No Chico Brush irrigation efficiency research project, this study is also being conducted in partnership with CSU and also involves a side-by-side comparison on seven different field study sites in Western Colorado. Each of these sites will compare normal irrigation practices with some form of

### WATER "BANK ACCOUNT" RISKS

Lakes Powell and Mead are the region's principal water "bank accounts" — with Lake Powell primarily benefiting the Upper Basin and Lake Mead primarily serving the Lower Basin. According to the 2007 Interim Operating Guidelines, which were approved by all seven Basin states and the US Secretary of the Interior, the two reservoirs are operated in a coordinated fashion in an effort to balance water supplies and drought risk between the Upper and Lower Basins. Both reservoirs have witnessed dramatic declines in their water levels since 1999. As of September 2015, Lake Powell hovered just above 51% full and Lake Mead was at 38% (*Reference 8*). Over the last decade, water leaders in the Basin have been assessing the risks to the region's water supplies based on current and projected future use, and seeking solutions to the reduction in lake levels.

**Risks of continuing drought to the Upper Basin include:**

- The loss of critically important hydropower production
- The reduction in revenues derived from the sale of this power and an associated loss of funding for Recovery Programs in the Upper Basin, which provide compliance with the Endangered Species Act for existing and future water use in the Upper Basin
- The reduction in funds for the Colorado River Basin Salinity Control Program that provides significant investment in upgrading irrigation infrastructure; these programs also help the United States meet treaty obligations regarding salinity with Mexico
- The reduction in revenues to repay the federal government for construction of federal water projects in the Colorado River Basin
- The potential for unilateral federal actions to ensure Lakes Powell and Mead do not fall below critical levels, which could cause uncertainty for all water users
- Increased risk of curtailment to post-Colorado River Compact water rights due to possible Compact administration

**Management Innovations**

**Split-Season Irrigation**

**Water Budget**

**Conservation Agreement**

**Carpenter Ranch Project**

**Split-Season**

**Abandonment Risks**

**Solutions**

**Willing Partners**

reduced irrigation on either alfalfa or pasture grass, which account for over 90% of the irrigated acreage in Colorado (*Reference 9*). Reduced irrigation methods covered in the study include practices ranging from not irrigating at all to stopping irrigation at different points throughout the season (known as "split-season irrigation"). The goal is to test a variety of approaches and evaluate both the agronomic impacts and water savings potential. Each site will test two years of reduced irrigation, followed by three years of recovery under full irrigation.

CSU has installed equipment at each field site to measure every aspect of the water budget, including water applied, surface water runoff, and soil moisture levels. Each field site is also associated with a weather station to allow CSU to calculate consumptive water use. CSU is also using remote sensing and satellite imagery to calculate water use, a method which could be applied to the entire basin. All of these feasibility studies will provide necessary information for addressing the many technical, social, and economic questions associated with designing water sharing programs that work for all sectors.

**System Conservation Pilot Program**

As Lakes Powell and Mead continue to drop, however, Colorado River water users feel increasing pressure to find solutions. In July 2014, the US Bureau of Reclamation (Reclamation) and the four major municipal water providers that rely on water from the Colorado River Basin (Central Arizona Water Conservation District, Denver Water, Metropolitan Water District of Southern California, and Southern Nevada Water Authority) signed the Colorado River System Conservation Agreement. This agreement outlines a two-year pilot program and provides $11 million dollars to test whether voluntary, compensated, and temporary reductions in consumptive use are a viable method to address the impacts of ongoing drought.

The first project authorized under this agreement was on The Nature Conservancy's Carpenter Ranch outside of Steamboat Springs, Colorado. The Carpenter Ranch has been an active cattle ranch since 1903 and has been managed for both agricultural and environmental goals since the Conservancy acquired the property in 1996. Typically, the property is irrigated from May through September with water from the Yampa River. Irrigated grass fields on the property provide pasture and hay production for the cattle operation, in addition to supporting important wildlife habitat.

Under the System Conservation Pilot Program, the Conservancy agreed to stop irrigating the Carpenter Ranch on July 1st. The water that would otherwise have been diverted for irrigation will be left in the Yampa River. Less irrigation means less pasture and hay production, and funds from the System Conservation Pilot Program help offset that loss and provide an incentive to participate in this water sharing experiment. For the Conservancy, participating in this pilot program is about getting ahead of a potential crisis and figuring out what works sooner rather than later. It's also about a commitment to finding long-term solutions that work for people and rivers, and testing those ideas on actual property with actual water rights.

The Carpenter Ranch holds some of the most senior water rights on the Yampa River and it was imperative to ensure that these water rights would not be jeopardized by participating in the pilot program. To address this issue, the Colorado Water Conservation Board established a formal state conservation program so that any water rights enrolled in a pilot project will be protected under two pieces of Colorado legislation: Senate Bill 05-133 (10) and Senate Bill 13-19 (11). This legislation protects the Carpenter Ranch water rights from any risk of abandonment or reductions in historic consumptive use associated with the approved pilot project. Providing assurances that water rights holders are not putting one of their most valuable assets at risk is essential not only for the pilot program, but for any future water sharing in the Colorado Basin. For more information regarding The Carpenter Ranch, *see* www.nature.org/ourinitiatives/regions/northamerica/unitedstates/colorado/helping-the-colorado-river-at-carpenter-ranch.xml.

## CONCLUSION: OPPORTUNITIES AT EVERY SCALE

At a fundamental level, the efforts described above are trying to find solutions to a problem that has no easy answers. We have to figure out a way to live within our hydrologic means. This will not be easy. It's going to mean figuring out how we can save water in agriculture in ways that work for producers and rural communities. It will involve ensuring that cities grow in smart ways that use less water. It means recognizing the value and importance of water left in stream. And then it involves tying it all together, which is no easy task. Success will involve tools — the infrastructure, institutions, and science of improved management described in this article — and the partnerships necessary to apply these tools on the ground.

There are opportunities to build water security at every scale. On the farm or ranch, we should pursue projects that work with willing partners to better understand and improve agricultural water use. This will provide the infrastructure needed to enable voluntary participation in any water sharing program while bringing long-term benefits to our rural communities. It is imperative that we develop options for reducing irrigation that can work for agriculture. This includes the kind of temporary split-season irrigation the Conservancy tested on the Carpenter Ranch this year. It could also include a concept we're hoping to test

**Management Innovations**

**Land Idling**

**Political & Social**

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next year: using funds from the System Conservation Pilot Program to pay farmers to plant a cover crop and then idle the property for three consecutive years — the required rest period for organic certification. For interested farmers, the pilot program could save water while providing an additional incentive to transition to organic.

Once we save water on the farm or ranch we must determine how to keep that water in the river. This will involve improvements to the ditch system itself, like automated headgates and other control structures, but will also require the commitment on the part of the ditch company or irrigation district to manage their ditches in a new way.

In the community, we need to design programs to improve water security that provide multiple benefits while offsetting potential impacts. To accomplish this, we need to involve key partners in the community and understand their water needs. Science and planning will play critical roles, but a network of community partners on the ground is required to actually make any program work.

How do we integrate work at these three scales — farm, ditch, and community — to build a functional water sharing program that increases security for all Colorado River Basin water users? This will involve technical challenges, but the political and social issues will be the biggest hurdle. In his paper, *Water and Democracy: New Roles for Civil Society in Water Governance (Reference 12)*, Lawrence Susskind writes: "...we continue to treat the allocation of water as a technical problem when, in fact, it is primarily a social problem." In reality it is both, but we are much further ahead on the technical side and have work to do on the social side.

Moving forward, there is opportunity to improve water security for people and nature at every scale, but with a river system that is at the breaking point, we must focus on building trust and partnerships between water users in order to design and put into action the tools we need to increase water security for our communities, for agriculture, and for the environment.

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# MITIGATION OF INJURY TO WATER RIGHTS

LAW & STRATEGIES IN IDAHO

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Mitigation of Injury

Mitigation Offset

Water Law Mitigation

Tribal Claims

Aquifer Recharge

Idaho Supply

Environmental Effects

No Veto Power

Court Authority

## INTRODUCTION

### DIFFERENT MEANINGS OF MITIGATION

Before launching into a discussion of mitigation, it should be observed that mitigation means different things in different contexts. In the dictionary sense, it means to reduce the extent or intensity of a harm, rather than to avoid or eliminate it altogether. It is used in that sense in the law of contracts, which calls on the non-breaching party to mitigate (i.e., minimize) the damages caused by the breaching party. In this context, the party suffering the damages — not the party causing the damages — is called upon to mitigate the damages.

In environmental and water law, however, it is the party causing the harm who undertakes the mitigation. For example, federal environmental laws might require a party to mitigate adverse impacts to wetlands or endangered species by taking offsetting actions to restore habitat. Though not usually termed mitigation, the same concept applies in the context of air and water pollution credit trading programs.

In water law, mitigation describes an action by one water user to offset injury that his or her diversion causes to another water user. A water right holder may divert under a water right only to the extent that doing so does not cause material injury to senior water right holders. That duty to avoid injury expands to include juniors as well as seniors when a water right is changed (aka transferred) in some way. In other words, the change cannot be approved if there will be injury to any other water right (junior or senior). In order to avoid injury, the right holder may seek to "mitigate" that injury. This allows an existing use to continue or a new or changed use to be made. Where water rights are concerned, the idea is not just to reduce the harm, but to avoid or eliminate material injury altogether, thus making the other water user whole.

In the water rights context, mitigation may come in various forms. On occasion, notably in the context of settlement of tribal reserved rights claims, mitigation may consist of an array of government funded or facilitated measures addressing environmental and instream flow concerns that may or may not be directly related to the alleged injury to the reserved rights. In other contexts, state or other governmental entities may undertake aquifer recharge or other water replacement programs on a regional scale in response to or in anticipation of delivery calls that could cause economic dislocation.

These are examples of large-scale government-sponsored approaches to mitigation. More often, water right mitigation is undertaken by private parties for the benefit of specifically identified water users as a means of preventing injury to other water rights.

Elsewhere in the West, water right mitigation is often undertaken in response to extraordinary strains on water supplies that are complicated by: federal environmental laws (e.g., the Endangered Species Act); tribal reserved water rights; and/or federal decrees or compacts apportioning water supplies between states. Idaho, in contrast, enjoys a comparatively abundant water supply. Moreover, most water right mitigation in Idaho is undertaken without the complication of a federal law overlay. Accordingly, Idahoans enjoy ample opportunities for win-win solutions that allow the State's water to be put to optimum use while avoiding injury and protecting environmental values.

Even when no federal environmental laws are applicable, the environmental effects of a mitigation plan are appropriately considered under Idaho law. This is called out in Idaho's Conjunctive Management Rules themselves (IDAPA 37.03.11.043.03.j). It is also reflected in the Idaho Water Code's local public interest provisions (Idaho Code §§ 42-202B(3), 42-203A(5)(e), 42-222(1), 42-1763). Finally, the mitigation plan must work within the constraint of any existing instream flow water rights (Idaho Code §§ 42-1501 to 42-1507). On the other hand, it is not the obligation of the mitigating party to *enhance* environmental conditions (see discussion of instream flows below).

## CALIFORNIA'S "PHYSICAL SOLUTIONS DOCTRINE"

It is not necessary that the injured water right holder agree to the mitigation proposed by the party causing the injury. If the Idaho Department of Water Resources (IDWR) or a court finds that a mitigation plan proposed by the party causing the injury is sufficient to avoid material injury, that plan may be approved over the objection of the injured parties.

California has taken this a step further, allowing mitigation to be designed and imposed by the court. Thus, under what is known in California as the "physical solutions doctrine," California has gone much

**Mitigation of Injury**

**Court Imposition**

**Equitable Decree**

**"Physical Solutions" Breadth**

**Condemnation**

**Financial Solution**

**Aquifer Recharge Options**

further than Idaho in imposing mitigation solutions. Although this doctrine has no applicability in Idaho, we discuss it here because, by way of contrast, it sheds light on how mitigation is viewed in Idaho.

Under California's doctrine, a court may craft its own mitigation solution and impose it on both parties. The seminal case dates to 1936: "[I]t is not only within the power, but it is also the duty, of the trial court to admit evidence relating to possible physical solutions, and, if none is satisfactory to it, to suggest on its own motion such physical solution. The court possesses the power to enforce such solution regardless of whether the parties agree." *City of Lodi v. East Bay Municipal Utility Dist.*, 60 P.2d 439, 341 (Cal. 1936) (citation omitted).

More recently, the California Court of Appeals summarized the physical solution doctrine this way: "As noted, a physical solution is an equitable decree designed to implement the constitutional mandate and to maximize the beneficial use of water. The court has power to enforce a physical solution regardless of whether the parties agree to it." *Central Basin Municipal Water Dist. v. Water Replenishment Dist. of S. California*, 150 Cal.Rptr. 3d 354, 360, Cal. App. 4th 943, 950 (2012).

The breadth of the doctrine is captured in this commentary:

> In working out a physical solution to water shortages where more efficient means of diversion and conveyance may be desirable, a court of equity is not limited by physical properties as they stand at the time of trial, or by suggestions and offers made by the parties. If it feels that substantial savings can be effected at reasonable cost by changing some of the works, it has the power, by injunctive order, to cause the change to be accomplished and to apportion the cost as justice may require. The court must, however, keep in mind that prior appropriators have prior rights and cannot be required lawfully to incur any material expense in order to accommodate a later appropriator. In working out a physical solution and determining whether an injunction should be granted, the fact that there is no immediate danger to a water right is an element to be considered. If the trial court needs or desires expert assistance or evidence to determine a physical solution in the problem of putting water resources to beneficial use to the fullest extent possible, it possesses the statutory power either to refer the matter to the division of water rights, or to appoint it as an expert.

Romualdo P. Eclavea, et al., *Physical Solutions as Equitable Remedy in Allocating Water Interests*, 62 Cal. Jur. 3d Water § 456 (2015) (footnotes omitted).

Indeed, commentators have gone so far as to describe as mitigation what amounts to condemnation of the senior water right that is suffering the injury:

> A physical solution is not incompatible with a finding that it will not provide full compensation, and if the facts justify it, an award of damages may be made in addition to the physical solution. Further, a physical solution need not be applied when the remedy in damages is adequate.

*Id.* (footnotes omitted).

If this commentary is correct, it means that California's physical solutions doctrine embraces not only the imposition of physical solutions, but financial ones, on the parties to a water conflict. It would allow a court to say, in essence: "I am not impressed with the mitigation strategy urged by the juniors. It is costly and likely to be ineffective in the long run. But it is not in the public interest simply to curtail the juniors. Given the enormous economic benefits of allowing the juniors to continue to divert (in comparison to the economic benefits generated by the senior), the sensible thing is for the senior to stop diverting and the junior to fully compensate the senior for its resulting losses."

## AQUIFER RECHARGE IN IDAHO: THREE TYPES

Water right mitigation strategies run the gamut — drying up farms, piping water to new places, building dams — you name it. An increasingly common and important mitigation strategy involves aquifer recharge. Indeed, aquifer recharge may be used either as a basis to mitigate other water rights or for storage of water to create new water rights.

Because aquifer recharge is so important (and complicated), this section draws distinctions among three very different approaches to aquifer recharge.

Aquifer recharge approaches include:

- Aquifer Storage and Recovery
- Public Betterment Aquifer Recharge
- Aquifer Recharge for Mitigation

These three approaches have different goals and operate in different ways. Each has value, but each sets out a distinct path that should not be confused with the others. All are commonly accepted approaches to mitigation in Idaho, though not necessarily under these designations.

**Mitigation of Injury**

**ASR Supply**

**Underground Storage**

**Aquifer Storage and Recovery (ASR)**

The first category of aquifer recharge is known in Idaho as **a**quifer **s**torage and **r**ecovery (ASR). ASR is not a mitigation strategy, but rather is a water supply strategy in support of new water rights. It is conceptually no different than storing water in an above-ground reservoir. Obviously, water put in the ground does not stay put quite as well as water held behind a dam. Accordingly, a major part of any ASR project is the technical challenge of quantifying how much will remain for subsequent diversion over time. This typically involves computer modeling.

ASR is generally undertaken by private parties to create a stored underground supply for later diversion to beneficial use by the entity undertaking the recharge. For example, Micron Technologies diverts water from the Boise River, stores it in an aquifer, and later pumps and uses a calculated volume based on the amount recharged. ASR works conceptually like a surface reservoir, while also providing water purification benefits.

In theory, an ASR project could be undertaken by a governmental agency, just as the federal Bureau of Reclamation built irrigation dams across the West for the ultimate benefit of individual irrigators. But there is no precedent for this in Idaho.

**Recharge Aquifers**

**Public Betterment Aquifer Recharge (PBAR)**

Aquifer recharge may be undertaken by the State or other entities for the general benefit of all water users. I call this "Public Betterment Aquifer Recharge" (or PBAR). There are several statutory references to "public betterment" in the context of aquifer recharge. For example: "In view of the public betterment to be achieved by the completion of aquifer recharge projects, the legislature hereby declares that the appropriation and underground storage of water by an aquifer recharge district hereinafter created for purposes of ground water recharge shall constitute a beneficial use... ." 1982 Idaho Sess Laws ch. 204 (previously codified at Idaho Code § 42-4202(2)) (repealed in 2009). PBAR typically involves large scale, regional efforts to recharge aquifers through infiltration ponds and/or by running water in leaky irrigation canals during the non-irrigation season.

The practice often is undertaken with little or no hydrologic analysis. This is because the water put in the ground does not result in any specific new or enhanced water right to divert that water. Nor does it serve as a basis for releasing particular water uses from a delivery call.

**Supply Recharge**

There is no need to monitor or quantify how much good a PBAR project does, because it is not undertaken as a basis for subsequent diversion under right or as mitigation for particular water right users. Rather, PBAR is simply an effort to create a better supply for all. This "firms up" the rights of all water users connected to the aquifer and reduces the likelihood of conflict among users.

**"Public Betterment" Purpose**

PBAR may be undertaken as a precautionary measure before delivery calls are made, or it may be undertaken in direct response to a call by holders of senior water rights. The thing that distinguishes "public betterment" aquifer recharge from other aquifer recharge is that PBAR is not undertaken for the specific benefit of particular water users. Thus, in a call situation, a PBAR project might be of sufficient size to completely eliminate the call, or it might only partially satisfy the call, thereby reducing the number of juniors called out. In either case, water continues to be allocated in order of priority just as before. No one has a special claim to the water recharged through PBAR.

**Replacement Supply**

**Aquifer Recharge for Mitigation (ARM)**

A third form of aquifer recharge involves recharging an aquifer for the purpose of providing a replacement supply to senior users who, but for the recharge, would call out juniors. I call this "Aquifer Recharge for Mitigation" (ARM). This course of action may occur, for instance, where steps are taken to add water to an aquifer, which then discharges the additional water to a stream serving senior surface users.

By providing this mitigation, other users may secure new appropriations or avoid having existing rights called out. This sort of mitigation may be undertaken by individual water users for their own benefit, by municipal providers, by quasi-governmental ground water districts for the benefit of their members, or by a mitigation project developer who, in turn, sells mitigation plans or credits to junior water users.

**Specific Benefit**

Unlike PBAR, ARM is undertaken for the benefit of specific junior water users (or a class of them, such as members of a ground water district). An ARM recharge plan is calculated to provide a replacement supply sufficient only to compensate for the impact caused by the specific diverters providing the mitigation. Thus, other diverters who have not provided mitigation may continue to be called out. In contrast to PBAR, an ARM plan invariably requires strict attention to hydrogeology, pumping effects, ground water movement, and similar variables; often, a ground water model is involved. Implementing an ARM allows its sponsor to take credit for providing the replacement supply, thereby allowing it or its members to continue diverting. Meanwhile, other juniors who fail to offer mitigation may face curtailment.

**Credit**

**Mitigation of Injury**

**Ground Water Districts**

**For Profit Purpose?**

**Speculation Hostility**

**Project Development**

**For-Profit Plans**

**Common Law**

**Beneficial Use**

**Taxing Authority**

SHOULD ARM BE UNDERTAKEN FOR PROFIT?

No one seems to struggle with the idea of ARM undertaken by junior water users to avoid a call or by governmental entities to help resolve a call. Indeed, one of the stated legislative purposes of ground water districts is to develop and implement ARM. In response to growing attention and concern among water users about conjunctive management issues, particularly within the Eastern Snake River Plain, the Idaho Legislature enacted legislation authorizing the creation of ground water districts. 1995 Idaho Sess. Laws ch. 290; Idaho Code § 42-5200 et seq. The primary purposes of these special districts were to provide a mechanism for ground water users within a given area to organize and assess themselves for the costs of measuring and reporting annual ground water withdrawals from wells, and as necessary, responding collectively to delivery calls, curtailment orders, or other forms of administration. Thus, ground water districts, unlike water districts, are not water delivery entities.

In contrast, ARM undertaken for profit by third-party mitigation project developers is a new concept in Idaho, and has encountered some resistance. This discomfort with the idea of for-profit aquifer recharge is reflected, for instance, in unsuccessful legislative efforts over the last few years. Specifically, there have been efforts to modify Idaho Code § 42-234 (authorizing water rights for aquifer recharge). Some of the legislative proposals appear to reflect a measure of uncertainty or mixed feelings with respect to efforts by private parties to undertake for-profit aquifer recharge programs (particularly those involving new appropriations) in support of mitigation plans that will be sold to other water users. Also involved may be concerns that successful ARM projects, using stream flood flows, will reduce amounts flowing through hydropower projects on the Snake River that cannot demand, but benefit from, these flows.

Some people sense something wrong in someone profiting by selling an interest in a mitigation plan that utilizes a public resource like water. This concern may derive from the Prior Appropriation Doctrine's hostility to speculation and the insistence that only those putting water to beneficial use may obtain rights therein. Others dismiss this concern, pointing out that there is no incompatibility between individual profit and maximum use of the resource. After all, the biggest canal in the Treasure Valley — the New York Canal — is so named because it was conceived and funded by entrepreneurs two thousand miles away in New York City. Likewise, no one doubts the right of a farmer to sell his or her water rights at great profit. Similarly, no one doubts that for-profit water brokers may lawfully make a living matching buyers and sellers of water rights, thereby ensuring that this public resource finds its way to its highest and best use.

The fact is, water rights mitigation is increasingly complicated and challenging. Not every water user has the wherewithal to undertake a successful mitigation project. Your author sees nothing in the Prior Appropriation Doctrine that should prevent people from putting together such projects and selling credits in them to others. I don't know how to build a car, either. Nor do I care to rely on my government to build all the cars. I am glad that someone does build them, and is willing to sell one to me. For this analogy to work, however, it is essential that the developer of the mitigation project add something of value, rather than just appropriate water and sell it to others. That value may come in the form of engineering, infrastructure (diversion, storage, or delivery), computer modeling, administrative services, and the like.

The concern centering on the for-profit aspect of these efforts is particularly acute in the Big Wood River Valley. Plans are being explored by private mitigation project developers to use otherwise unclaimed spring flood flows to recharge the aquifer in the Sun Valley area to support mitigation plans. Mitigation would then be "sold" to holders of junior surface and ground water rights (or those diverting without any water right) who face all but certain curtailment in the coming years. It conceivably could support some new appropriations as well, a fact that seems hard to swallow for people confronted by the typical seasonal water scarcity in the area.

## STATUTES ADDRESSING MITIGATION

At its core, mitigation is a common law principle growing out of a water right owner's entitlement to provide a substitute supply to a senior, thereby allowing both parties to enjoy their constitutional right to divert. Idaho statutes provide scant guidance on water rights mitigation.

One of the few statutes speaking to the subject is the aquifer recharge statute mentioned above, Idaho Code § 42-234, which dates to 1978. It is a sweeping statement of public policy extolling the virtues and value of aquifer recharge coupled with maddeningly ambiguous regulatory authority over recharge projects. The statute may have been written with PBAR in mind, but its language is certainly not so limited. For instance, it includes the broad and unambiguous declaration that "the appropriation of water for purposes of ground water recharge shall constitute a beneficial use of water." Idaho Code § 42-234(2).

Since 1978, the Idaho Legislature has provided for the establishment of aquifer recharge districts, which have taxing authority to raise money for and undertake ground water recharge projects. Idaho Code §§42-4202 to 42-4231.

Mitigation of Injury

Forfeiture Protection

Another statute touching on the subject is a recent amendment to Idaho Code § 42-223(10) which expressly protects from forfeiture a water right that is not being diverted because of its use as part of a mitigation plan.

See also Idaho Code § 42-1416B dealing with expanded (i.e., enlarged) ground water rights within a critical ground water area. It provides: "Water shall be deemed unavailable to fill the rights for expanded use, even if decreed in the adjudication, unless the director finds that a management program exists which will, within a time period acceptable to the director, limit the average annual water withdrawals from the aquifer designated in the critical ground water area to no more than the average annual recharge to the aquifer."

Idaho Code § 42-1779 provides for "a statewide comprehensive aquifer planning and management effort over a ten (10) year period of time beginning in fiscal year 2009."

## MITIGATION: THREE TYPES

Forms of Mitigation

In Idaho, private water rights mitigation comes in various forms. One may place them into three broad categories, as follows:

- "Capital-M mitigation" (undertaken pursuant to Idaho's Conjunctive Management Rules in response to an active delivery call)
- "small-m mitigation" (developed outside of the Conjunctive Management Rules: (a) in support of an appropriation, transfer, or exchange; (b) in anticipation of a delivery call; or (c) in response to an active delivery call against a surface right (which is not covered by the Conjunctive Management Rules))
- "ESPA mitigation" (a sub-species of "small-m mitigation") involving changes in points of diversion of ground water rights hydrologically connected to surface rights (Eastern Snake River Plain)

Terminology

"Conjunctive Administration"

First, a note on terminology: "Administration" refers to the Idaho Department of Water Resources' (IDWR's) statutory responsibility to enforce priority, including the curtailment of junior water rights when required to meet senior needs. "Conjunctive administration" refers to the administration of ground and surface water rights together. The term "conjunctive management" is broader. It refers to the full panoply of mostly voluntary governmental and private efforts to reduce conflict between ground and surface water users and promote more effective utilization of all water resources. Thus, while conjunctive administration deals with the brute-force "policing"/regulation of priorities, conjunctive management includes such things as: research; education; voluntary conservation measures and other demand reduction; recharge projects; provision of replacement water supplies; and other efforts to stabilize or improve water availability. This distinction in terminology, however, is fairly recent. At the time that the Conjunctive Management Rules were adopted in 1994, the term "conjunctive administration" was not yet in vogue. Using current terminology, those rules would more appropriately be named the Conjunctive Administration Rules.

### Mitigation Pursuant to the Conjunctive Management Rules: "Capital-M mitigation"

Conjunctive Management Rules

The only formal administrative rules dealing with mitigation are contained within the Conjunctive Management Rules (IDAPA 37.03.11.000 to 37.03.11.050). The Conjunctive Management Rules were promulgated in 1994 (approved by the Legislature in 1995) in response to calls for the administration (i.e., curtailment) of ground water rights by a trout farm. *See, Musser v. Higginson*, 125 Idaho 392, 871 P.2d 809 (1994). They set out a carefully crafted set of legal principles governing the difficult subject of delivery calls directed to junior ground water rights. However, the applicability of these rules is limited.

Scope

The Conjunctive Management Rules come into play only in response to "a delivery call made by the holder of a senior-priority surface or ground water right against the holder of a junior-priority ground water right in an area having a common ground water supply." IDAPA 37.03.11.001. Notably, they do not come into play until a delivery call is made. Even then, they do not apply to calls against surface water users, and they apply only if an area of "common ground water supply" has been established. *Id.*

Modeling Need

Arguably, another prerequisite of conjunctive administration is the development of a reliable computer model to evaluate the effect of ground water diversions and recharge on surface rights and other ground water rights. This is not stated in so many words in the Conjunctive Management Rules, but it is difficult to imagine how IDWR would fulfill its obligation to evaluate material injury and the futile call defense in the absence of such a model. The whole premise of the Conjunctive Management Rules is that rights should not be curtailed by rote application of the priority system (as is done, more or less, for surface water calls); instead curtailment should be limited to the extent necessary to effectively prevent material injury. *See*, IDAPA 37.03.11.020.04 (application of futile call principle), IDAPA 37.03.11.010.08 (definition of futile call); IDAPA 37.03.11.042 (determining material injury).

## Mitigation of Injury

### Active Call

### No Advance Approval

### Creative Solutions

### Out-of-Kind Mitigation

### Approval Factors

### Material Injury

### Application Mitigation

### New Appropriation

### "Out-of-Priority" Use

### Storage Mitigation

The Conjunctive Management Rules address a host of issues. One of them is mitigation plans developed in response to a delivery call against ground water users. This is known as "Rule 43" of the Conjunctive Management Rules. IDAPA 37.03.11.043 ("Rule 43"). Rule 43 borrows heavily from the Colorado concept of "plans for augmentation." This was the first time the concept of *private* mitigation for the benefit of specific water rights was codified in Idaho.

As noted, the Conjunctive Management Rules operate in the context of an active — as opposed to anticipated — delivery call. Accordingly, a water user may not obtain *advance* approval of a Capital-M mitigation plan under Rule 43 in anticipation of a call. A water user may develop a mitigation plan and keep it on the shelf, but IDWR will not determine the plan's adequacy until the delivery call is made and everyone's hair is on fire. This may seem odd, but IDWR takes the position it does not know what the delivery call will look like until it sees it and cannot approve a plan in the abstract. Likewise, IDWR says that senior users should not be required to review and object to every mitigation plan (or forever hold their peace) in advance of an actual delivery call. Furthermore, until the delivery call is made, it is not clear which seniors have an interest in, and must be entitled to respond to, the Capital-M mitigation plan.

Rule 43 recognizes that no two mitigation plans are alike. The rule encourages creative solutions tailor-made to the specific circumstances of the call. Specifically, it notes that mitigation may come in the form of "other appropriate compensation." IDAPA 37.03.11.043.c. For instance, a water user might pay for efficiency improvements in the senior's use of water, thereby enabling the junior to provide less wet water as a replacement supply. Likewise, it is conceivable that a junior user depleting an instream flow might provide offsetting habitat improvements to compensate for the flow reduction. This is known as out-of-kind mitigation (as opposed to in-kind mitigation, which is replacement water). Tradeoffs like these are common in negotiated settlements, but compelling the senior water user to accept out-of-kind mitigation is new territory in Idaho.

Rule 43 established a detailed list of "factors" the IDWR Director must consider in determining whether to approve a plan. The factors control the Director's otherwise broad discretion. One of the factors is agreement between the junior and senior users. But this is only a factor — even a stipulation of the parties that the mitigation is adequate may be rejected by the Director. In the absence of a stipulation, a mitigation plan proposed by the junior user may be imposed on the senior making the call. The rules do not appear to go so far as California has under its physical solutions doctrine, which would allow IDWR to devise its own mitigation solution and impose it on both parties (discussion above). There has been no suggestion, to date, in Idaho that damages would be a sufficient remedy for injury to a water right.

The plan must address only "material injury," not insignificant or fanciful injury. Rule 42 of the Conjunctive Management Rules sets out various factors — including the efficiency of the senior's use and the reasonableness of the senior's means of diversion — to consider in determining whether an allegation of injury constitutes "material injury." IDAPA 37.03.11.042.

**Mitigation When There Is No Conjunctive Management Delivery Call: "small-m mitigation"**

MITIGATION PLANS IN SUPPORT OF APPLICATIONS FOR APPROPRIATION, TRANSFER, OR EXCHANGE

As noted above, Capital-M mitigation plans are available only in the context of responding to an active conjunctive management delivery call against a ground water right. However, IDWR will evaluate and recognize on a case-by-case basis what I call "small-m mitigation" plans that fall outside the Conjunctive Management Rules. For instance, IDWR will consider a plan to mitigate the impact of new appropriations, transfers, or exchanges.

Suppose a homeowner or real estate development requires a new water right, but water in the area is either fully-appropriated or new appropriations are subject to frequent curtailment due to their junior priority. (Alternatively, suppose that a domestic well has been illegally diverting water for irrigation or aesthetic purposes in excess of the authorized amount, and the owner wishes to obtain a lawful appropriation.) In such a case, the applicant will need a plan to mitigate the effects of new appropriation by providing a replacement supply for senior water users. The result is to allow water under the new appropriation to be diverted "out-of-priority" so long as the mitigation plan is in effect. ("Out-of-priority" is a commonly employed shorthand to reflect that the right is subject to curtailment due to its junior priority. Thus, being authorized to divert out-of-priority means that the right is receiving special treatment due to the mitigation plan. Meanwhile, other junior rights that have not provided mitigation are subject to curtailment in order of priority.) For all practical purposes, the junior priority of the new right becomes irrelevant, and the new right takes on the priority date of whatever water right is offered as mitigation. Or, if the mitigation plan is premised on storage (including aquifer recharge), then its ability to divert out-of-priority is effective so long as stored water is physically available to offset any material injury that would otherwise be caused by the diversion.

**Mitigation of Injury**

**Protecting Existing Rights**

**Advance Planning**

**Replacement Water**

**Plan Re-Opener**

**Forfeiture**

**Nature of Use**

**Mitigation Protected**

**IDWR Guidance**

#### MITIGATION OF EXISTING WATER RIGHTS

The owner of a junior water right may be concerned that his or her right will be called out in the future. This is a real threat in the Big Wood River Valley today, where trophy homes and hobby ranches in the Sun Valley area face imminent curtailment of ground water rights in conjunctive administration. Even today, surface water rights as senior as the early 1880s are subject to late-season curtailment in the Big Wood because they are junior to even more senior downstream surface rights.

The difficulty is that a Capital-M mitigation plan under the Conjunctive Management Rules cannot be approved in advance of the delivery call. And, under current policy, IDWR will not evaluate a small-m mitigation plan outside the context of an application for appropriation, transfer, or exchange.

A water user wishing to secure approval of a mitigation plan for an existing right prior to a delivery call may get the plan before IDWR by subjecting the existing right to some sort of water right application, such as a transfer application to add an alternative point of diversion. Kluges like this are not always available, however.

Even if they cannot obtain advance review and approval of the plan, junior water users are nonetheless well advised to put together a mitigation plan and have it available in the event of a delivery call. At that point, it may be offered as a Capital-M plan, and the user will find out if IDWR deems it good enough. However, if it is developed by competent engineers, hydrogeologists, and water attorneys, the likelihood of it being effective is maximized.

#### SMALL-M MITIGATION MUST BE "LIKE KIND"

As noted above, Rule 43 of the Conjunctive Management Rules contemplates the possibility of out-of-kind mitigation (i.e., something other than a replacement supply of water). In contrast, small-m mitigation plans, which operate outside of Rule 43, ordinarily provide like-kind mitigation. In other words, a water user relying on a small-m mitigation plan will probably be required to provide a water supply to the senior of sufficient quantity, quality, and timing to meet the senior's needs to the same extent as those needs would have been met by curtailing the junior.

#### SMALL-M MITIGATION IS SUBJECT TO RE-EVALUATION AT TIME OF DELIVERY CALL

As noted above, Capital-M mitigation plans, once approved, cannot be re-opened during the course of the call. Small-m mitigation plans that are approved in the context of an application for appropriation, transfer, or exchange do not enjoy that certainty. IDWR may approve the mitigation plan for purposes of the pending application, thus allowing the permit, transfer, or exchange to be approved. However, if and when a delivery call is made in the future, the effectiveness of the previously approved mitigation plan may be reevaluated in light of new circumstances and information, including impacts on parties not anticipated at the time the original plan was approved. In other words, approval of a small-m mitigation plan in anticipation of future conjunctive management provides no guarantee that the mitigation plan will be found adequate when the delivery call comes. Obviously, this uncertainly is a drag on marketplace and financial transactions involving property that requires reliable water rights.

#### NO LONGER REQUIRED TO CHANGE THE NATURE OF USE TO MITIGATION

Until recently, IDWR required that if the acquired right is left idle for mitigation purposes, its nature of use element must be changed to "mitigation," "aquifer recharge," or the like in order to protect the undiverted right from forfeiture.

This requirement to change the nature of use was of no great consequence, so long as the right was fully under the control of the person creating the mitigation plan. In other words, it was just another "t" that needed to be crossed. However, it presented a problem if, for instance, the plan relied on deliveries by a separate irrigation entity whose right cannot easily be changed to some other nature of use. For example, even if the irrigation district wanted to cooperate, it could not if it perceived that its water rights could not lawfully be changed to a use other than irrigation.

In response, the Legislature amended the forfeiture statute, Idaho Code § 42-223(10), to exempt from forfeiture a water right that is not diverted because of its use in a mitigation plan. Consequently, a mitigation plan may now safely rely on an undiverted water right, without putting that right through its own transfer proceeding to change its nature of use to mitigation.

On November 4, 2015, IDWR issued two guidance documents specifically addressing mitigation plans associated with applications for permit, transfer, or exchange. Jeff Peppersack, Chief Water Allocation Bureau, *Application Processing Memo #71, Transfer Processing Memo #27: Describing Mitigation in Water Right Records* (revised Nov. 4, 2015); Jeff Peppersack, Chief Water Allocation Bureau, *Application Processing Memo #72: Evaluation of Mitigation Plans for Water Right Permits* (revised Nov. 4, 2015).

## Mitigation of Injury

### Pond Rights

### Transfer

### Different Sources

### Instream Flows

### Moving Upstream

### No Injury Rule

### Subordination Condition

### Purchasing Senior Right

### Providing Mitigation

These guidances are limited to "small-m" mitigation; they do not address mitigation in the context of the Conjunctive Management Rules. They confirm that if the mitigation plan is approved, it is not necessary to place the "unused" water right in the Water Supply Bank in order to protect it from forfeiture.

#### EXAMPLE INVOLVING MITIGATION OF PONDS

In Idaho, a water right is required for every artificial pond (to cover the evaporative loss), even if the pond fills naturally with ground water. IDWR has determined that the consumptive use associated with irrigation is virtually identical to the annualized evaporative loss of ponds on an acre-for-acre basis. In other words, if you dry up an acre of irrigated land to create a one-acre pond, there is no gain or loss of water to the system. Thus, it would seem to be a trivial exercise to convert previously irrigated land to aesthetic ponds. Alas, it can be tricky, and a mitigation plan may be required.

In one example, a developer sought to convert farm land irrigated with surface water to a commercial development with ponds that would fill naturally from ground water with a high water table. If the farm land had been irrigated with ground water, a portion of those rights readily could have been changed from irrigation use to aesthetic pond use. This would be a straight transfer with no mitigation required. Of course, the aesthetic right would have the same priority date as the ground water right and would thus be vulnerable to being called out in a future conjunctive administration call. The problem is that this is not a risk the pond-owner is allowed to take. If a ground-water-fed pond is found to be not in priority, the water cannot simply be shut off. Water will continue to fill that pond no matter what (unless the pond is filled in). Thus, the owner would be obligated to scramble to develop a new mitigation plan under crisis conditions.

Here, the irrigation water had a solid, senior priority, but there was a different problem. The farm was irrigated with surface water, while the pond is fed by ground water. Surface and ground water are considered to be different "sources" of water, and transfers from one source to another are not allowed. Nor could the developer obtain a new appropriation of shallow ground water to feed the pond, because the shallow ground water is hydrologically related to the fully appropriated Boise River.

Consequently, it was necessary to develop a mitigation plan. The surface water right previously used for irrigation of the land where the ponds were located was left undiverted and dedicated to mitigation of the evaporative loss of the ponds. The additional water left in the Boise River thus would offset any claim of injury by downstream seniors. (No one raised an issue about impacts to other ground water users; the "pressure point" was the over-appropriated Boise River.)

#### MITIGATION AND INSTREAM FLOWS: MOVING UPSTREAM

Where a junior water right is subject to curtailment — or where there is no unappropriated water available to cover an illegal or new use — one approach is for the user to acquire a senior right and transfer it his or her use. This, of course, is not mitigation; it is a simple transfer. This can be tricky, however, where a point of diversion of a surface right must be moved upstream — which must be done in a manner that protects all other water rights on the river, even juniors. It is all the more challenging where the other water right involved is an instream flow right.

Such is the case in the Big Wood River Valley where two instream flow waters rights (NOs. 37-7919 and 37-8307) have been imposed on the Big Wood River from Ketchum to Bellevue. As a practical matter, this makes it impossible to move a senior water right upstream within or above the protected reach. Water diverted at a farm below the protected reach has no impact on the protected reach. But if the point of diversion is moved upstream, the depletion will diminish flows in the protected instream flow reach.

This is a huge problem on the Big Wood because most of the properties in need of water are within or above the protected reach and nearly all of the senior rights available for purchase are downstream.

IDWR has adopted the practice of imposing a condition on such upstream transfers subordinating them to the minimum stream flow rights. The effect of the "subordination" condition is that the transferred right cannot be exercised any time the minimum stream flow right is not being met. Because the minimum stream flow rights on the Big Wood River are quite junior (1981 and 1987), they are often out of priority and not being met. As a practical matter, such a condition defeats the entire purpose of the transfer, because the right may only be used in the wettest years despite its early priority.

The good news is that there is a work-around for the minimum stream flow problem — at least for some users. You guessed it, it involves a mitigation plan. The idea is to acquire a senior surface right capable of providing a replacement supply to the seniors downstream. (To be effective, the replacement water right must be upstream of every downstream senior who could place a call on the junior. It would be pointless to eliminate one user's call and still be subject to another.)

Instead of transferring the acquired right up the river, it is used to provide mitigation to downstream seniors (thereby allowing the out-of-priority upstream diversion to continue). Conceptually, it works

## Mitigation of Injury

### Mitigation v. Injury

### Satisfying Senior Rights

### No Injury Rule

### Curtailment Calls

### Forfeiture Issues

### Scenarios Overview

like this. One does not change any of the elements of the acquired right. Instead, it is simply not diverted (drying up whatever land it formerly irrigated). In the event of a call (or as part of another water application), the user seeks approval of a mitigation plan under which the un-diverted replacement water compensates for any injury caused to the senior user(s).

One might ask why calling it "mitigation" works when simply transferring the same right up river is not viewed as injury to the instream flow. The impact on the minimum stream flow is identical under either scenario. In either case, the continued diversion by the junior will diminish flows that would otherwise be available to the instream right. The answer is this works if and only if the upstream junior holds a water right that is senior to the instream flow right. Like all water rights, the instream flow right "took the river as it found it" (when their right was first established), which included the upstream user's right to divert. Thus, the upstream user is entitled to continue to divert to the detriment of the even more junior instream flow right. Moreover, the upstream user is entitled to respond to a call by a downstream senior in any way that satisfies the senior. For example, the junior could go to the senior and offer enough money to simply buy the senior out. Doing so would allow the junior to divert more (in priority with other rights), and the instream flow right would have no basis to complain. A mitigation plan based on a substitute supply closer to the senior is no different. Yes, every user (including the instream flow) "takes the river as he or she finds it." But one of the things they "take" is the potential that a downstream senior will no longer need or desire to call for as much water. The instream flow right may "hope" that the upstream right is called out. However, if that happens, it would be only an incidental result of the call. The purpose of the call was to satisfy the downstream senior, not to incidentally benefit the instream flow. The holder of the instream flow right may not complain if the upstream diverter manages somehow to satisfy the call and continue its diversion. Thus, the upstream user may continue to divert, under the mitigation plan, even when the minimum stream flow is not being met.

In contrast, if he or she had sought simply to transfer the replacement right upstream to serve his or her use, the transfer would have been denied (or subordinated to the instream flow right, which amounts to the same thing when water is scarce). This is because transfers under established water law must avoid injury to all other water rights, even the junior minimum stream flow right. In contrast, the mitigation plan essentially amounts to a transfer of the acquired right downstream to the senior, which has no injury effect on the instream flow.

Again, however, this mitigation approach will only be effective if the upstream user holds a valid water right that is senior to the instream flow. In other words, it is a hollow accomplishment for the mitigation plan to resolve the call by the downstream diverter if the junior upstream right is still subject to curtailment by a more senior instream flow right. If the mitigation plan involved idling a senior right upstream of both the instream flow right and the senior downstream diverter, then it could effectively respond to both calls. The problem in the Big Wood River Valley is that nearly all of the senior rights available for purchase are located within or downstream of the instream flow reach. To be effective in a call by the instream flow right, the mitigation would need to benefit the entire reach.

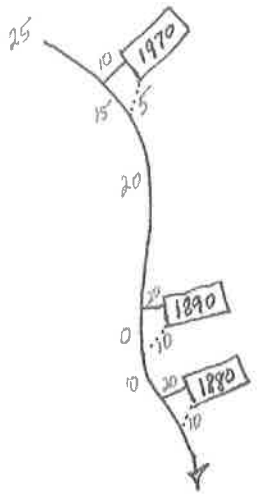
The upshot is that a seemingly worthless upstream junior water right is quite valuable indeed so long as it is senior to the instream flow rights and is coupled with a mitigation plan that addresses injury to senior diverters further downstream.

There is one possible glitch. Because the mitigation cannot be approved as a Capital-M mitigation plan until there is a delivery call (nor as a small-m mitigation plan outside of a water right application), the non-diverted replacement water is subject to forfeiture. (Idaho Code § 42-223(10) protects from forfeiture both Capital-M and small-m mitigation plans, but only if they have been approved by IDWR.) Accordingly, steps should be taken to either: (1) get the mitigation plan approved as a small-m plan, which necessitates some sort of a transfer or other application; (2) keep the replacement water in use until needed for mitigation; or (3) put the replacement water into the water supply bank.

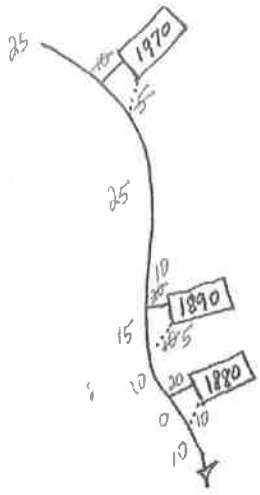
**Scenarios Comparison**

This concept of mitigating a downstream senior to benefit a diversion upstream of (or within) a reach protected by an instream flow right is conceptually tricky. The simplified schematics on the next page that follow may assist the reader in seeing how this works. *Scenarios A1*, *A2*, and *A3* show how much easier it is to move water rights around in the *absence* of an instream flow right. These scenarios illustrate how an upstream junior may respond to a delivery call by a downstream senior by buying another right and moving it upstream. *Scenarios B1* and *B2* show how this does not work if there is an intervening instream flow. *Scenario B3* shows how an upstream transfer past an instream flow will not work. *Scenario B4* illustrates how a downstream mitigation plan may work even when moving the right upstream does not.

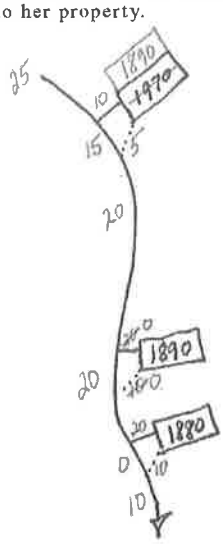
**Scenario A1:**
**Shortage Before Call**
In this scenario, 25 units of water is insufficient water to satisfy all three users. The downstream 1880 right is short 10 units and is entitled to call for water.



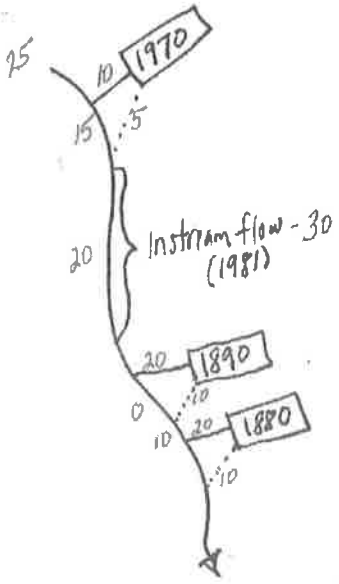

**Scenario A2: Result After Call**
The 1880 right will initiate a delivery call resulting in the complete curtailment of the 1970 right and a partial curtailment of the 1890 rights.
The 1880 right is made whole.



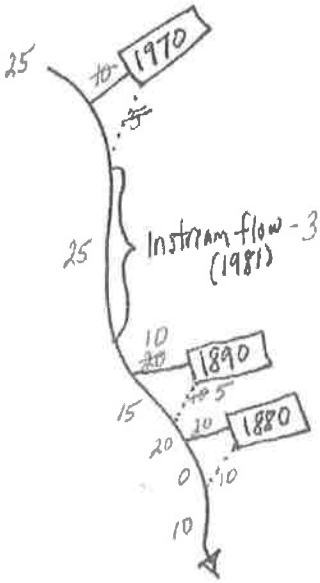

**Scenario A3: Result After Transfer of 1890 Right**
Faced with being called out, the owner of the junior 1970 right may acquire the 10-unit portion of the 1890 right that survives the call and move its point of diversion up to her property.



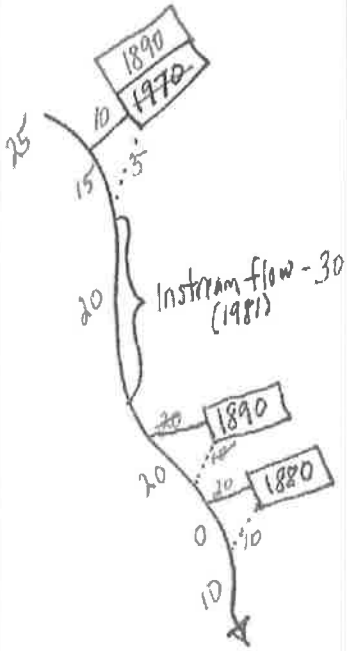

**Scenario B1:**
**Shortage Before Call:** This is the same as Scenario A1, exceptfor the addition of an instream flow right of 30 units with an 1981 priority date. Again, 25 units of water are insufficient to satisfy all water rights. The downstream 1880 right and the instream right are each short 10 units. The 1880 right is entitled to call for water. In contrast, the 1981 instream flow right may not, because it is junior to the upstream user. It must suffer the 10 unit shortage.




**Scenario B2: Result After Call**
The 1880 right will initiate a delivery call resulting in the complete curtailment of the 1970 right and a partial curtailment of the 1890 right.
The 1880 right is made whole.
The 1880 right will not call out the junior instream flow, because doing so would not add any new water.
The result is identical to Scenario A2 (without the instream flow).

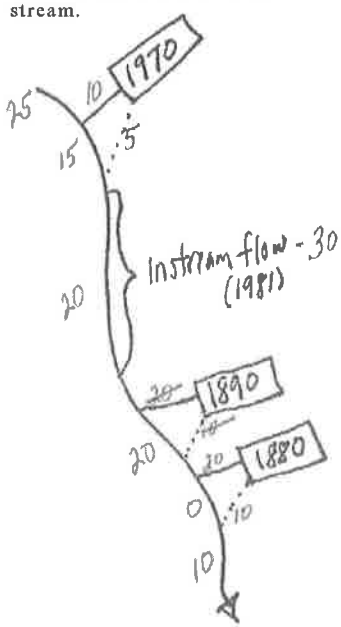



**Scenario B3: Result After Attempted Transfer of 1890 Right**
As in Scenario A3, the owner of the junior 1970 right may acquire the 10-unit portion of the 1890 right that survives the call and attempt to move its point of diversion up to her property. Doing so would not be allowed, however, because a change in the point of diversion will only be allowed if no injury occurs. Moving the 1890 right upstream would reduce the instream flow to 20 units (compared to 25 units before the transfer as shown in Scenario B2). Accordingly, this transfer would be denied.




## Scenarios Comparison

**Scenario B4:**
**Result After Mitigation Plan Using 1890 Right**
Alternatively, the owner of the junior 1970 right may acquire the 10-unit portion of the 1890 right that survives the call and use it in a mitigation plan that dries up the farm.
The additional 10 units now flows to the 1880 right, making it whole and allowing the 1970 right to continue to divert.
The other 10 units under the 1890 right would continue to be called out by the 1880 right, but that is of no concern to the holder of the 1970 right, whose only duty is to mitigate for the injury her diversion causes.
Meanwhile, the instream flow continues to suffer a 10-unit shortage, but, it can do nothing about it. The instream flow cannot call out the 1970 right, because it is junior to that right. Nor can it complain of the mitigation plan, which involves no change in point of diversion and, in any even, does not affect water rights above it on the stream.



## Mitigation of Injury

### Direct Transfer

### Upstream Move

### Replacement Supply (Aquifer)

### Ownership Impact

### Ground Water Transfers

### Hydraulic Connection

### River Impact

### Specific Reaches

### ESPAM Model

### Reduction of Right

**A SENIOR WATER RIGHT IS ACQUIRED AS A REPLACEMENT SUPPLY**
**WHY NOT SIMPLY TRANSFER IT TO THE ACQUIRING JUNIOR USER?**

The basic premise of many mitigation plans is to acquire a senior right and make it available to the senior to offset the adverse effects of the junior's diversion.

One might ask, having gone to the trouble of acquiring the senior right, why not simply transfer it to serve the junior's use? The effect would appear to be identical. Either way, the junior user gets to operate under the priority of the newly acquired water right. The answer is that, if the acquired right can be transferred to the acquiring party's place of use and point of diversion, that is probably the way to go — one should keep the solution as simple as possible. There are times, however, when a direct transfer of the replacement supply to the junior will not work.

In some cases, the senior surface right acquired as a replacement supply cannot be moved upstream without injury to other rights — notably where the stream is subject to an instream flow right (discussion above).

There may be other circumstances, such as where the replacement supply results from aquifer recharge or other storage, when it is not physically possible to get the new water to the place where the junior needs it. In other words, the only option may be to deliver the water to the senior under a mitigation plan. This might entail, for example, dry up of land irrigated by ground water where the land is located down-gradient from the junior but above-gradient from the senior, thus allowing the undiverted water to flow downward to the satisfy the call.

The mitigation water right may be owned by a water district or other entity that is unwilling or unable to allow a portion of its water right to be split off and transferred to a new use. But the district may be willing to let a portion of its water right go "idle" to serve as mitigation.

**Mitigation of Ground Water Transfers Within the Eastern Snake Plains Aquifer (ESPA)**

A special type of mitigation can arise in the context of transfers of ground water rights that are hydrologically connected to senior surface rights. This is a special sub-category of small-m mitigation. It arises due to the special connections between ground and surface water in the Magic Valley of Idaho.

Ordinarily it is fairly simple to move ground water points of diversion from one place to another within the same aquifer. There may be individual well interference issues (cone of depression issues). But, other than that, one may "move a straw from one end of the bathtub to the other" without any greater impact on the water resource or other users.

A different situation presents, however, where there is a hydraulic connection with surface water. In Idaho, this occurs most notably in the interaction of the Snake River and the Eastern Snake River Plain Aquifer (typically shortened to ESPA). The Snake River runs for hundreds of miles along or near the southern boundary of the ESPA, a massive aquifer covering 10,800 square miles and holding as much water as Lake Erie.

Water within the ESPA flows underground toward to the Snake River. Thus, every consumptive diversion of ground water from the ESPA results in a corresponding reduction in flows somewhere in the Snake River. Each well affects the river in a different way, however. To put it simply, wells in the upper (eastern) part of the aquifer reduce flows most significantly in the upper part of the Snake and have gradually less impact on each succeeding lower reach of the river. And vice versa.

As a result, moving a point of ground water diversion from "point A" to "point B" will increase flows in one part of the Snake while reducing flows in another. The net downstream depletion effect (once steady state is achieved) will be zero, but the effect on specific reaches of the river may be substantial as the impact is redistributed up and down the river. This change benefits some users and injures others.

Because the ESPA is administered as being fully-appropriated, new or expanding users (notably dairies, industries, and cities) must buy water rights from farms, dry them up, and transfer the water right to the new location.

For a while during the 1990s, IDWR refused to approve any ground water transfers due to the then-unquantifiable injury to surface users. Ultimately a computer program (known as the Eastern Snake Plain Aquifer Model or ESPAM) was developed to model the effect of every possible change location on every reach of the river.

This methodology, and IDWR's implementation of it to date, is focused solely on mitigating the adverse effects of a transfer on the affected reaches of the Snake (and tributaries thereto). The same methodology also quantifies the corresponding and offsetting positive impacts on other reaches of the river.

The result is that a person seeking to transfer a point of diversion to a new location in the ESPA may be required to leave some of the water behind, undiverted. (That quantity may be defined to change over time, reflecting the gradual impact of the transfer until steady state is achieved.) For instance, if the right authorized diversion of five cubic feet per second (cfs) at the original location, IDWR might approve a transfer of only four cfs, if the computer model showed that pumping that amount in the new location

## Mitigation of Injury

### "Credit" System

**Christopher Meyer** has practiced water law, planning and zoning law, constitutional law, natural resources law, road and public access law, constitutional law, and addressed legislative matters for over three decades. Best Lawyers in America has named him "Lawyer of the Year" four times. He is described in the Idaho Yearbook Directory as "centrally located in the world of Idaho public affairs" and "a key figure in Idaho water law." He serves on the Board of Advisors to the National Judicial College's "Dividing the Waters" water law program for judges. His clients include Fortune Ten companies, municipal water providers, cities, counties, highway districts, energy companies, food producers, mining companies, and land developers. Before joining Givens Pursley in 1991, Chris taught water law and negotiation at the University of Colorado Law School. Prior to that, he practiced environmental law as counsel to National Wildlife Federation in Washington, DC.

would leave no surface user of the Snake River worse off. The greater the distance the water is moved up and down the aquifer, the more water must be left behind to prevent injury.

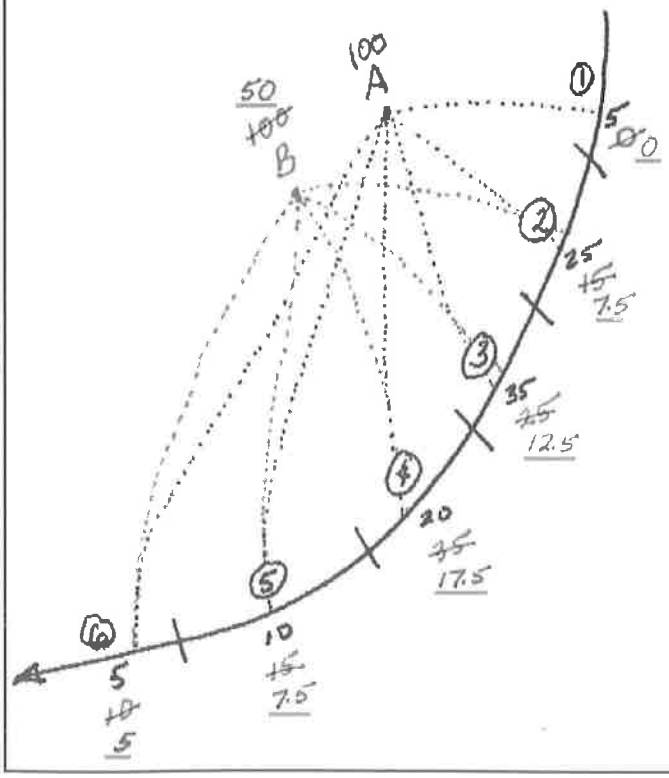
Of course, in such a transfer, some water users will be made better off. There are two ways in which the transferring party may capture this benefit. First, IDWR has recognized a "credit" for the improvement to other reaches of the Snake River. That credit (in theory at least) may be used to offset some future transfer in the other direction. A major piece of unfinished business is the full implementation of this "credit" system to reflect these positive benefits. So far, IDWR has approved water right transfers recognizing those benefits and securing the right of water right holders to claim them in the future once a system is put in place to quantify and trade those credits.

Alternatively, the water user (or water broker) may arrange various simultaneous transfers in opposing directions whose impacts on various reaches of the river cancel each other out, thus allowing the rights to be transferred at full face value (or close to it).

The reduction in transferred quantity based on the ESPAM is different from other mitigation plans in several ways. First, it is not undertaken in response to or anticipation of a conjunctive administration delivery call. Second, no new, alternate supply of water is provided to the other potentially injured rights. Instead, injury is avoided by cutting back the quantity of an existing right (the transferred right) or by using credits or offsets from other transfers. Third, once the transfer is approved, there is no ongoing mitigation plan to implement. Fourth, the effect of the mitigation is only to allow approval of the transfer. It has no effect in protecting the ground water user from a future delivery call. However, when that delivery call comes, it will be evaluated on the basis of the impacts of new quantity being diverted from the new place of diversion.

An illustrative example of a ground water transfer within the Eastern Snake Plain is set out in the illustration below. This is, of course, grossly simplified. It describes, for instance, the steady state result years after the change takes place, overlooking the dynamic changes that gradually occur over time. This hypothetical communicates, however, the basic principle that a change in the point of diversion may be accomplished without injury to any of the river reaches if the diversion quantity is reduced at the new point of diversion. This amounts to "leaving money on the table," because other reaches are benefited and the overall impact of the diversion is reduced. As noted above, this "money on the table" effect may be avoided by combining two or more transfers that, to some extent, cancel out each other's impact. This may be done simultaneously, or at different times through retention of credits after the first transfer.

**For Additional Information:**
Chris Meyer, Givens Pursley LLP , 208-388-1236 or chrismeyer@givenspursley.com




**Eastern Snake Plain Aquifer Ground Water Transfer Scenario**

In this scenario, 100 units of water are initially pumped from location A and consumptively used. The computer model calculates that this will diminish flows in each of six reaches of the Snake River as shown in black.

If the point of diversion is moved to location B, the computer model predicts that the steady-state impact on each river reach will be as shown in grey (amounts struck-through). The effect of the move from A to B is to improve flows in reaches #1, #2, and #3, but to reduce flows in reaches #4, #5, and #6. This equates to injury, and the transfer will not be approved for the full 100 units.

By restricting the diversion at point B to 50 units, the steady-state impact on each reach is reduced by half (as shown underlined). The result is that reaches #1, #2, #3, #4, and #5 all experience a decline in impact compared to pumping 100 units at point A (meaning more flow and no injury), while reach #6 is neutral.

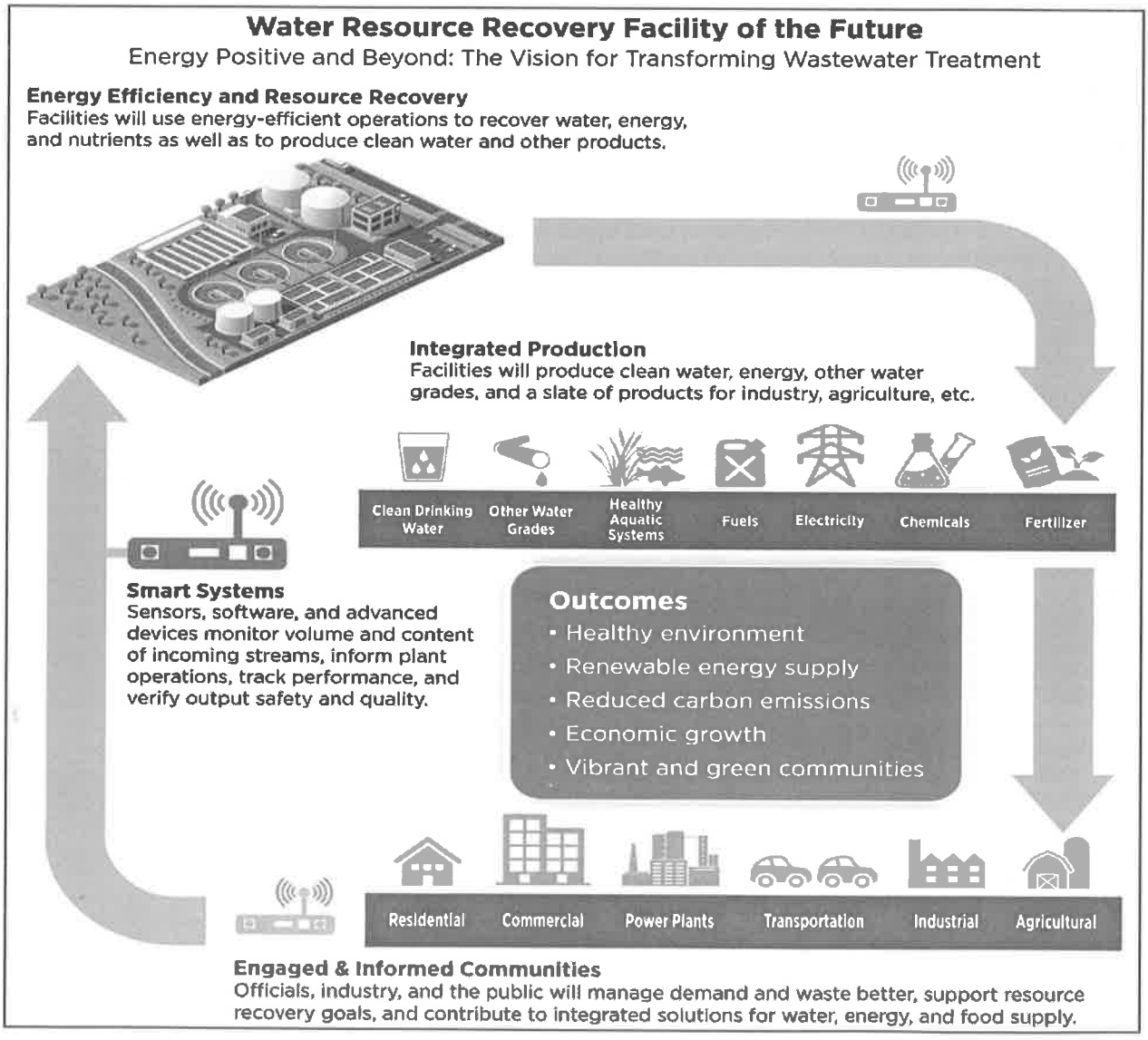
## WATER BRIEFS

**Energy-Positive Water Resource Recovery Workshop Report US**

A new 58-page report summarizing a workshop held jointly by the US Department of Energy, the US Environmental Protection Agency, and the National Science Foundation outlines a range of research and actions needed to transform today's water treatment plants into water resource recovery facilities. These future facilities would produce not only clean drinking water, but also biofuels, chemicals, and other water grades for specific uses, like agriculture. The report summarizes discussions and ideas presented at the "*Energy-Positive Water Resource Recovery Workshop*"— held by the three agencies in April 2015.

Wastewater treatment facilities, pipes, and related infrastructure in cities around the country are approaching the end of their expected service life. The infrastructure will require an investment of about $600 billion over the next 20 years if it is to continue to be reliably transporting and treating wastewater and delivering clean drinking water. A unique window of opportunity exists to apply new knowledge and technology to create an industry shift, from wastewater treatment to wastewater resource recovery. Such a shift offers the potential to reduce the financial burdens on municipalities, decrease stress on energy systems, cut air and water pollution, improve system resiliency to climate impacts, and support local economic activity.

At the workshop, experts from industry, academia, national laboratories, and government determined that wastewater resource recovery facilities should perform four major types of functions: 1) efficiently recover the resources in wastewater; 2) integrate production with other utilities, 3) engage and inform stakeholders, and (4) run smart systems. The experts also discussed challenges, including regulatory, technical, social, and financial barriers. Finally, the experts identified research opportunities that could produce or significantly advance the needed technology. The sponsoring agencies intend this report to stimulate further dialogue and accelerate the wide-scale advent of advanced water resource recovery facilities. The agencies are already addressing one frequent suggestion at the workshop by identifying facilities to serve as potential test beds for new technologies.




**For Info:** The report and presentations from the workshop, which was held at the National Science Foundation headquarters in Arlington, Virginia, on April 28–29, 2015, are now available:
www.energy.gov/eere/bioenergy/energy-positive-water-resource-recovery-workshop-report

## WATER BRIEFS

### WATER PLAN RELEASED CO

WATER SUPPLY STRATEGIES

On November 19, Governor John Hickenlooper of Colorado unveiled Colorado's Water Plan (Plan).

In the spring of 2013, Hickenlooper directed the Colorado Water Conservation Board to develop the Plan, a roadmap that would put the state and its eight major river basins on a more collaborative and cooperative path to manage water in the face of constrained supplies and growing population. Key to the Plan's success has been the steady participation of water providers, agricultural organizations, environmental groups, the General Assembly, local governments and the business community as well as more than 30,000 public comments geared specifically to the Plan since 2013.

The completed Plan represents the consensus view from this process that Colorado must take a strategic, proactive and statewide approach to water or risk leaving the fate of Colorado's water to decisions and actions from outside interests, the federal government, and other states within the Colorado River Basin. The Plan highlights necessary near-term actions, including efforts to conserve and store water, additional reuse and recycling of water, and providing more options to agriculture to avoid permanent dry-up of valuable farm and ranch lands. It also sets out a framework for discussion of any future projects that propose to move water between basins. The Plan specifically noted the danger of the "buy and dry" approach to transferring water rights from agricultural to municipalities: "Without a water plan, Colorado could lose up to 700,000 more acres of irrigated agricultural lands — that equals 20 percent of irrigated agricultural lands statewide and nearly 35 percent in Colorado's most productive basin, the South Platte. While the right to buy or sell water rights must not be infringed upon, Colorado's Water Plan describes market-competitive options to typical 'buy-and-dry' transactions." Plan at 10.6.

The final version of the Plan (Chapter 10, "Critical Action Plan") includes a set of measurable objectives designed to help Colorado move forward and provide a sense of the goals Colorado should set for addressing its water challenges. "Colorado's Water Plan sets a measurable objective of reducing the projected 2050 municipal and industrial gap from as much as 560,000 acre-feet to zero acre-feet by 2030…achiev[ing] 400,000 acre-feet of municipal and industrial water conservation by 2050…by 2025, 75 percent of Coloradans will live in communities that have incorporated water-saving actions into land-use planning...to share at least 50,000 acre-feet of agricultural water using voluntary alternative transfer methods by 2030…attaining 400,000 acre-feet of water storage in order to manage and share conserved water and the yield of Identified Projects and Processes by 2050…to cover 80 percent of the locally prioritized lists of rivers with stream management plans, and 80 percent of critical watersheds with watershed protection plans, all by 2030…to sustainably fund its implementation. In order to support this objective, the State will investigate options to raise additional revenue in the amount of $100 million annually ($3 billion by 2050) starting in 2020."

Colorado's Water Plan (2015) is an impressive document that covers a vast range of water issues. As such, it is highly recommended reading for all water professionals.

**For info:** Plan website at: http://coloradowaterplan.com/

### NUTRIENT RECYCLING US

LIVESTOCK WASTE COMPETITION

EPA is partnering with the US Department of Agriculture, pork and dairy producers, and environmental and scientific experts to launch the Nutrient Recycling Challenge, a competition to develop affordable technologies that recycle nutrients from livestock waste. Every year, livestock producers manage more than one billion tons of manure, which contains valuable nutrients — nitrogen and phosphorus — that plants need to grow. Challenge participants will develop technologies that extract nutrients from livestock manure to generate products with environmental and economic benefits that farmers can use or sell.

During the four-phase competition, innovators will turn their concepts into designs and eventually into working technologies that livestock farms will use in pilot projects. Phase I, which begins November 16 and ends January 15, calls for papers outlining ideas for these technologies. Phase I prizes will be announced in March and include up to $20,000 cash to be split between up to four semi-finalists; invitation to a two-day partnering and investor summit in Washington, DC; and entry into subsequent phases of the challenge with larger awards. Final awards will be announced January 2017, with farm demonstration pilots to follow.

**For info:** Website at: www.nutrientrecyclingchallenge.org

### RECYCLED SNOWMAKING CA

TREATMENT TO SKI AREA

Beginning in December 2015, Donner Summit Public Utility District (DSPUD) will begin supplying highly treated recycled water to Soda Springs Ski Resort (Soda Springs) for snowmaking purposes. This allows the District to conserve precious potable water supplies and provide an alternate water source that will contribute to a successful ski season.

In June of 2015, DSPUD completed a $24 million project converting its treatment process from a chlorination/de-chlorination process to a UV disinfection process resulting in highly treated, pathogen-free, crystal clear recycled water. This tertiary treated water meets or exceeds Title 22 requirements as regulated by the Regional Water Quality Control Board of California and is effectively cleaner than surface water. Title 22 expressly outlines the bacteriological water quality standards for recycled water uses that have a high probability for human contact. DSPUD obtained an updated National Pollutant Discharge Elimination System (NPDES) Permit from the California Regional Water Quality Control Board, Central Valley Region, in June of 2015. This permit allows for the use of recycled water for snowmaking at Soda Springs.

**For info:** DSPUD, 530/ 426-3456 or http://dspud.com/index.php

## WATER BRIEFS

### FOREST ROADS US
**STORMWATER DISCHARGE**

EPA issued a notice on November 10th in the Federal Register that it is seeking public comment on the effectiveness of existing programs to address water quality impacts associated with forest road stormwater discharges. EPA will publish an additional notice on or before May 26, 2016, with its determination as to whether stormwater discharges from forest roads are required to be regulated under Clean Water Act (CWA) section 402(p)(6).

The information requested will assist EPA in responding to the remand in *Environmental Defense Center, Inc. v. U.S. EPA*, 344 F.2d 832 (9th Cir. 2003) that requires EPA to consider whether the CWA requires EPA to regulate forest roads. This notice does not imply that EPA has made any decision to do so.

EPA is considering the implementation, effectiveness, and scope of existing programs in addressing water quality impacts attributable to stormwater discharges from forest roads prior to making any decision. EPA plans to assess a variety of existing programs, including federal, state, local, tribal, third party certifications, and combinations of these approaches, as well as voluntary **b**est **m**anagement **p**ractices (BMPs)-based approaches. EPA will assess whether any additional stormwater controls are called for, consistent with federal law, including the recent 2014 amendments to the CWA.

**For info:** EPA Notice at: www.federalregister.gov/articles/2015/11/10/2015-28649/notice-of-opportunity-to-provide-information-on-existing-programs-that-protect-water-quality-from

### STATE OF THE SOUND WA
**REPORT RELEASED**

In the first week of November, the Puget Sound Partnership (PSP) released its annual "*State of the Sound*." The analysis and findings of the 2015 State of the Sound (2015 SOS) reports are intended to help PSP's partners and decision-makers better understand the state of the Sound's ecosystem, where progress is being made, where challenges remain, and where focused investment is needed. The Report to the Governor and Legislature specifically responds to RCW 90.71.370(3).

The 2015 SOS notes three priorities as part of its "Roadmap to Recovery" with $875 million as the estimated cost: 1) preventing stormwater pollution; 2) engaging in habitat protection and restoration; and 3) reopening shellfish beds by identifying and fixing pollution sources. The Report highlights that habitat is getting better, with 24 projects that restored estuaries to tidal inundation, impacting 2,260 acres, from 2006 to 2014. From 2011-2014, 39 floodplain projects improved 14,500 acres of habitat. In 2011-2013, six of 22 Puget Sound Chinook salmon populations saw slight upticks, but the total number of wild spawning Chinook salmon declined as compared to 2006-2010. The current count of the Orca population is 82 (as of October). Despite births of five orcas the past year, population status is still lagging behind the 2010 baseline of 86 whales.

**For info:** Complete 2015 SOS available at PSP website: www.psp.wa.gov/sos.php

### DROUGHT PROOFING OK
**WATER FOR 2060**

On October 23, Oklahoma Governor Mary Fallin praised Oklahoma's Water for 2060 Advisory Council for its diligent work to develop a blueprint for drought-proofing Oklahoma. The advisory council's final report will help in achieving the statewide goal of consuming no more fresh water in 2060 than was consumed in 2012. The advisory council was charged with studying and recommending appropriate water conservation practices, incentives, and educational programs to improve efficiency of statewide water usage while preserving Oklahoma's population growth and economic development.

The report includes 12 key recommendations that are the product of interactive dialogue with water users across Oklahoma and collaborative discussions to determine approaches that can effectively promote water efficiency. The advisory council based its recommendations on best practices in use in Oklahoma and incentive programs in place in other states. The information was supplemented with an analysis of data from the 2012 Oklahoma Comprehensive Water Plan and estimates of the cost-effectiveness of various measures for enhancing water use efficiency and the use of alternative sources of supply.

"To meet the ultimate goal of Water for 2060 will require effort and participation from all water users, whether changing our daily behaviors and decisions at home to new innovations and practices for crop irrigation, energy production and industry," said J.D. Strong, Oklahoma Water Resources Board executive director and Water for 2060 advisory council chairman (*see* Strong, *TWR* #136). "We must never forget that water conservation will be key to meeting Oklahoma's long-term water needs because it remains the cheapest and quickest way to preserve Oklahoma's water resources for future generations." The advisory council's work was supported by a partnership between the OWRB and the US Army Corps.

**For info:** Water for 2060 available at: www.owrb.ok.gov/supply/conservation.php

### HARMFUL ALGAL BLOOMS US
**DRINKING WATER**

Harmful algal blooms and their associated toxins pose a risk to drinking water quality. EPA released a comprehensive strategic plan on November 15th outlining actions to address algal toxins in drinking water. Solving the challenge of algal toxins in drinking water will require action at all levels of government and approaches that are collaborative, innovative, and persistent. EPA will work closely with other federal agencies, state and local governments, and the public to provide scientific and technical leadership on a number of fronts, including health effects studies. EPA will work on treatment techniques and monitoring technologies, develop innovative mapping tools to help protect drinking water sources, provide technical support to states and public water systems, issue health advisories, and support activities to protect drinking water sources.

**For info:** Plan available at: www2.epa.gov/sites/production/files/2015-11/documents/algal-risk-assessment-strategic-plan-2015.pdf; Blog about the plan available at: https://blog.epa.gov/blog/2015/11/next-steps-to-protect-drinking-water/

### STORMWATER LAWSUIT CA
**OAKLAND SUES MONSANTO**

On November 10, Oakland City Attorney Barbara J. Parker filed a lawsuit to hold the Monsanto chemical company accountable for its long-standing contamination of Oakland's

## WATER BRIEFS

stormwater and the San Francisco Bay with highly toxic Polychlorinated Biphenyl (PCBs). *City of Oakland v. Monsanto Company, Solutia Inc. and Pharmacia Corporation*, U.S. District Court Case No. 4:15-cv-05152.

Monsanto produced PCBs for approximately 50 years until the US Congress banned them because they endanger human and environmental health. Despite the 1979 ban, today PCBs are a common environmental contaminant that is found in all natural resources including water and plants as well as the tissues of marine life, animals, and humans. PCBs can destroy fish habitats and are associated with illnesses and cancer in humans.

Oakland is alleging that Monsanto knew that PCBs were toxic and could not be contained as they readily escaped into the environment. Oakland claims that although evidence confirms that Monsanto recognized that PCBs were becoming "a global contaminant" well before the 1979 ban, it concealed this information and increased production.

Oakland's press release noted that the State Water Resources Control Board (Board) has determined that the presence of PCBs in Oakland's stormwater threatens San Francisco Bay as a habitat for fish and wildlife and interferes with the Bay's use and enjoyment by the people of the State of California. The Board recently issued a tentative order that affects Oakland's stormwater operations and may require a reduction in the maximum daily load of PCBs that flow from Oakland waterways into the Bay. Other California cities are subject to similar storm water orders related to the reduction of PCBs prior to discharge.

Oakland alleges it will incur significant costs to remove PCBs from stormwater flowing into San Francisco Bay and that countywide costs could reach $1 billion. Parker emphasized that those clean-up costs should not be borne by taxpayers, but by the company that knew its product would cause this contamination.

Oakland is one of a growing number of cities that have filed similar lawsuits against Monsanto including San Jose, San Diego, and Spokane, Washington.

**For info:** Complaint available at: www.oaklandcityattorney.org/PDFS/PCB%20Complaint.pdf; Alex Katz, City Attorney's Office, 510/ 238-3148 or akatz@oaklandcityattorney.org

### TREATED STORMWATER USED FOR IRRIGATION — FL

The City of Altamonte Springs, Florida (City) is working with the Florida Department of Transportation (FDOT) to capture stormwater from Interstate 4 (I-4) and treat it to be used for irrigation. The brainchild of city engineers, the project is called Altamonte Springs-FDOT Integrated Reuse and Stormwater Treatment (A-FIRST for short). A partnership to develop the project is made up of FDOT and the City, along with the Florida Department of Environmental Protection (DEP), the St. Johns River Water Management District, and the City of Apopka.

Before A-FIRST, stormwater would run off I-4 and flow into drainage ponds along the road. Over time, the water and some pollutants would seep into the groundwater. Now, stormwater will be captured, treated and redirected into the City's reclaimed water system and then used for irrigation. When extra water remains, the City will send any of its remaining water to the City of Apopka, which is experiencing water shortages of its own. In the process of creating what is called an "alternative water supply," the project also reduces impacts to area springs and improves water quality in the Little Wekiva River. The project is being almost entirely funded by the State of Florida through their savings from *not* having to build retention ponds.

The City already has a reclaimed water system throughout Altamonte Springs (Project APRICOT), with almost every property connected to the system to irrigate lawns and landscaping. Project APRICOT, the official name of the reclaimed water program, was first proposed by Altamonte Springs in 1981, and was also the first system of its kind in the southeast US. It is still the model used by planners and engineers today, according to the City.

**For info:** Altamonte Springs, 407) 571-8567 or www.altamonte.org/index.aspx?nid=699

### HERBICIDE DISAPPROVAL US EPA SEEKS REVOCATION

In response to litigation by public-interest groups including the Center for Biological Diversity, EPA is seeking to vacate its previous approval of a new herbicide and remand to the agency for additional review. EPA wants to revoke approval of the herbicide "Enlist Duo" because its combination of chemicals may be significantly more harmful than initially believed. Approved by the agency just over a year ago. Enlist Duo is a combination of glyphosate (also known as Roundup) and 2,4-D that Dow AgroSciences (Dow) created for use on the next generation of genetically engineered crops to control weeds that are resistant to glyphosate.

EPA's reversal came after its failure to consider the impacts of Enlist Duo on federally protected plants and animals was challenged by an environmental and food-safety coalition. The coalition alleged that combining the two chemicals could result in new "synergistic" toxic effects — EPA had concluded when it approved the herbicide that there would not be any synergistic interactions between the two ingredients.

EPA recently discovered, however, that Dow itself was claiming synergistic effects for Enlist Duo in a patent filing. "Recently, however, EPA discovered that Dow made claims of 'synergistic herbicidal weed control' in its Provisional and Non-provisional patent applications for Enlist Duo." EPA's Respondents' Motion for Voluntary Vacatur and Remand, p. 5. As EPA pointed out in its Motion regarding its 2014 decision of approval: "Here, EPA has learned that it did not have all relevant information at the time it made its registration decision. Specifically, Dow did not submit to EPA during the registration process the extensive information relating to potential synergism it cited to the Patent Office; EPA only learned of the existence of that information after the registrations were issued and only recently obtained the information." *Id.* at 7.

EPA further explained its request for revocation in its Motion: "EPA also seeks vacatur of the registration because EPA cannot be sure, without a full analysis of the new information, that the current registration does not cause unreasonable effects to the environment, which is a requirement of the registration standard under FIFRA." *Id.* at 2.

**For info:** EPA's Motion available at: www.panna.org/sites/default/files/2015-11-24%20EPA%20Voluntary%20Vacatur.pdf

## WATER BRIEFS

### EARTHQUAKES PLAN OK

**DISPOSAL WELLS IMPACTS**

The Oklahoma Corporation Commission's Oil and Gas Conservation Division (OGCD) is implementing a plan in response to earthquakes in the Cherokee-Carmen area. The plan calls for changes to oil and gas wastewater disposal wells in the area that dispose into the Arbuckle formation.

The plan calls for two disposal wells to stop operations, and for 23 others to reduce disposed volumes. The plan may change based on any new data. The total net volume reduction is 41 percent. In addition, disposal wells within 10 to 15 miles of the earthquake activity are being placed on notice to prepare for possible changes.

The plan, implemented on November 19, is the latest in a series of actions taken by OGCD to address earthquakes which have been occurring with increased frequency.

**For info:** Matt Skinner, OGCD, 405/521-4180, m.skinner@occemail.com or www.occeweb.com/

### STORMWATER POLICY CA

**NEW STRATEGY CONSIDERED**

On August 19, 2015, the California State Water Board held a workshop to receive input on the *Draft Proposal to Develop a Storm Water Program Workplan and Implementation Strategy*. On November 2, the Board released a *Draft Strategy to Optimize Resource Management of Storm Water* (Storm Water Strategy) for public comment. As of press time, the Board is scheduled to consider adopting the Storm Water Strategy at its December 15 meeting in Sacramento.

The draft Storm Water Strategy's Executive Summary states:

"Storm water runoff from municipal separate storm sewer systems (MS4s), industrial facilities, and construction sites is a major source of water quality impairment throughout the developed areas of California. Additionally, population growth, climate change and the current drought are increasing pressure on the state to take immediate action and manage its water resources more effectively. These challenges represent an opportunity to redefine how California utilizes and values storm water as a water resource. Well-conceived storm water management actions provide multiple benefits for California communities, including improved water quality, increased water supply, increased space for public recreation, increased tree canopy, enhanced stream and riparian habitat area, as well as many other benefits. Accordingly, this proposed [Storm Water Strategy] identifies the goals, objectives, and actions needed for the State Water Resources Control Board and nine Regional Water Quality Control Boards (Water Boards) to improve the regulation, management, and utilization of California's storm water resources.

...This Storm Water Strategy identifies a ten year vision and mission with a description of outcomes anticipated. ...Goals, objectives, and proposed projects are also identified...to successfully implement the mission and achieve the vision. Finally, the Storm Water Strategy includes a phased implementation approach based on internal and external resources to accomplish the proposed projects."

**For info:** California State Water Board website: www.swrcb.ca.gov/water_issues/programs/stormwater/strategy_initiative.shtml#availabledocs

### COLUMBIA PROSPECTS NW

**NEW BASIN ASSESSMENT AVAILABLE**

A new report — *Transboundary Cooperation in the International Columbia River Basin: A Preliminary Assessment of Existing Arrangements and Future Prospects* (Report) — commissioned by the Northwest Power and Conservation Council (Council) and the Columbia Basin Trust (Trust) identifies a number of areas for improved cooperation and collaboration across the international border in the Columbia River Basin.

The Report responds to requests made by participants at the October 2014 International Columbia River conference in Spokane — *Learning from Our Past to Shape Our Future* — which was co-hosted by the Council and the Trust. Participants specifically challenged the Trust and Council to bring together individuals and organizations working across the international border to share data, information, and funding to collaborate on ways to effectively and efficiently address complex regional environmental and energy issues, as well as foster a greater sense of shared Columbia River Basin identity.

The Report recommends potential next steps for the Council and Trust, and others, in their role as transboundary cooperation facilitators.

A total of 46 transboundary initiatives are described in the Report. The identified initiatives fall into the following categories: ecosystem function; fish passage and restoration to areas blocked by dams; invasive species and/or toxic substances in water and land; climate change; energy; and transboundary river governance.

Compelling needs identified in the Report include:

- Improving basinwide coordination
- Coordinating fishery and hatchery management in the mainstem Columbia and its tributaries
- Creating integrated and consistent invasive species management protocols throughout the basin
- Improving understanding of interconnectedness and shared responsibility regarding basinwide resource management
- Cultivating a Columbia River Basin identity and basin culture

Of these, the three with the greatest promise, according to Report authors, are: 1) convening annual meetings or forums on transboundary issues such as, for example, efforts to eradicate invasive species; 2) creating a publicly accessible, shared transboundary database; and 3) expanding and integrating environmental monitoring programs to share information across the border.

**For Info:** Report available at: www.nwcouncil.org/news/blog/transboundary-collaboration-report/

### INFRASTRUCTURE FUNDS US

**EPA NEWSLETTER & WEBSITE**

EPA is developing a new quarterly email newsletter called "*Water Finance E-News*." It will provide updates for those seeking and providing project funding. The newsletter will cover EPA's Clean Water State Revolving Fund, Water Infrastructure and Resiliency Finance Center, Water Infrastructure Finance and Innovation Act Program, Clean Water Indian Set-Aside, Alaska Native Villages and Rural Communities Grant Program, and the US-Mexico Border Water Infrastructure Program. It will report on the latest program developments, trainings, and tools from these programs.

**For info:** EPA Water Finance Center at: www2.epa.gov/waterfinancecenter

## CALENDAR

**December 15 CA**
**Storm Water Strategy - Public Meeting of SWRCB, Sacramento.** CalEPA Hdquarters Bldg., 1001 I Street. Presented by State Water Resources Control Board. For info: Annalisa Kihara, SWRCB, 916/ 324-6786 or Annalisa.Kihara@waterboards.ca.gov

**December 15-17 NV**
**Groundwater Expo '15: The Intersection of Today & Tomorrow, Las Vegas.** Westgate Resort & Casino. Presented by National Ground Water Ass'n. For info: http://groundwaterexpo.com/

**December 17 CA**
**Senate Bill 88 & Draft Emergency Regulation for Measuring & Reporting on the Diversion of Water - Public Workshop, Sacramento.** CalEPA Hdquarters Bldg., 1001 I Street. Public Comment Deadline at Noon, December 17th. For info: Paul Wells, SWRCB, 916/ 323-5195 or paul.wells@waterboards.ca.gov

**January 13-14 TX**
**10th State of the Bay Symposium: 20 Years of Successfully Preserving Galveston Bay, Galveston.** Moody Gardens Hotel & Convention Ctr. Presented by TCEQ & Galveston Bay Estuary Program. For info: www.tceq.state.tx.us/p2/events/State-of-the-Bay-Symposium

**January 14 CO**
**Future Grid Conference, Boulder.** Wolf Law Bldg., Wittemyer Courtroom. Presented by Silicon Flatirons Center. For info: www.silicon-flatirons.org/events.php?id=1610

**January 15 WA**
**SEPA & NEPA Seminar, Seattle.** WA State Convention Ctr. For info: Law Seminars Int'l, 800/ 854-8009, registrar@lawseminars.com or www.lawseminars.com

**January 15-17 MT**
**2016 CLE & SKI, Big Sky.** Big Sky Resort. Presented by the MT Bar. For info: www.montanabar.org/events/event_details.asp?id=711713

**January 19-21 ID**
**Idaho Water Users Ass'n Annual Convention, Boise.** The Riverside Hotel. For info: IWUA, 208/ 344-6690 or www.iwua.org/

**January 21-22 WA & WEB**
**23rd Annual Endangered Species Act Conference, Seattle & WEB.** Washington Athletic Club, 1325 6th Avenue. For info: The Seminar Group, 800/ 574-4852, info@theseminargroup.net or www.theseminargroup.net

**January 21-22 AZ**
**Tribal Water in Arizona Seminar, Phoenix.** Radisson Phoenix North. For info: Law Seminars Int'l, 800/ 854-8009, registrar@lawseminars.com or www.lawseminars.com

**January 28-29 TX**
**Texas Wetlands Conference, Houston.** JW Marriott. For info: CLE Int'l, 800/ 873-7130 or www.cle.com

**February 4-5 NV**
**Law of the Colorado River Conference, Las Vegas.** The Wheelhouse. For info: CLE Int'l, 800/ 873-7130 or www.cle.com

**February 7-8 CA**
**Ocean Desalination in California Seminar: Examining Technical, Regulatory & Practical Solutions, Santa Barbara.** Fess Parker's DoubleTree Resort. For info: The Seminar Group, 800/ 574-4852, info@theseminargroup.net or www.theseminargroup.net

**February 18-19 NV**
**2016 Family Farm Alliance Annual Conference, Las Vegas.** Monte Carlo Resort. For info: www.familyfarmalliance.org

**February 21-24 CA**
**Back to Basics: Will Compliance Concerns Derail Efforts to Innovate? - National Ass'n of Clean Water Agencies (NACWA) Winter Conference, San Diego.** Westin San Diego. For info: NACWA, www.nacwa.org/16Winter/

**February 23-25 CO**
**2016 UIC Annual Conference, Denver.** Embassy Suites Downtown. Presented by Groundwater Portection Council. For info: www.gwpc.org/events

**February 24-27 CA**
**Water Environment Federation (WEF) 2016 Utility Management Conference 2016, San Diego.** Hilton San Diego Bayfront. Presented by Water Education Foundation. For info: http://wef.org/conferences/

**February 26 OR**
**Freshwater Trust's Annual Gala & Auction, Portland.** Portland Art Museum. For info: www.thefreshwatertrust.org

**February 26 CA**
**Endangered Species Act Conference, San Diego.** The Westin. For info: CLE Int'l, 800/ 873-7130 or www.cle.com

**February 29-March 1 OK**
**Oklahoma Water Law Conference, Oklahoma City.** Skirvin Hilton. For info: CLE Int'l, 800/ 873-7130 or www.cle.com

**March 3-4 CA**
**California Wetlands Conference, San Francisco.** Hotel Nikko, 222 Mason Street. For info: CLE Int'l, 800/ 873-7130 or www.cle.com

**March 7-10 RI**
**American Water Works Association (AWWA) Sustainable Water Management Conference, Providence.** Providence Biltmore. For info: http://www.awwa.org/conferences-education/conferences/sustainable-water-management.aspx

**March 21 AZ**
**Water Resources Research Center Annual Conference 2016, Tucson.** UA Student Union. For info: https://wrrc.arizona.edu

**March 29-30 TX**
**34th Annual ABA Water Law Conference, Austin.** Hyatt Regency Austin. For info: http://shop.americanbar.org/ebus/ABAEventsCalendar/EventDetails.aspx?productId=202302853

**March 31-April 1 OR**
**Pacific Northwest Timberlands Management Conference, Portland.** World Trade Center. For info: The Seminar Group, 800/ 574-4852, info@theseminargroup.net or www.theseminargroup.net

**April 7-8 TX**
**Water Acquisition & Management for Oil & Gas Development: Legal & Regulatory Requirements, Houston.** TBA. Presented by Rocky Mt. Mineral Law Foundation & Institute for Energy Law. For info: www.rmmlf.org

**April 11-13 DC**
**Federal Water Issues Conference, Washington.** Washington Court Hotel. Presented by National Water Resources Ass'n. For info: www.nwra.org/upcoming-conferences-workshops.html

**April 11-14 IL**
**National Ass'n of Environmental Professionals Annual Conference, Chicago.** Palmer House Hilton. For info: www.nwaep.org/event-1973831

**April 18-19 WA**
**Clean Water & Stormwater Seminar, Seattle.** TBA. For info: Law Seminars Int'l, 800/ 854-8009, registrar@lawseminars.com or www.lawseminars.com

**April 19-20 UAE**
**Global Water Summit 2016, Abu Dhabi.** Jumeriah at Etihad Towers. Organized by Global Water Intelligence. For info: www.watermeetsmoney.com/agenda

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## CALENDAR

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**April 25-27 AK**
**Water-Energy-Environment: 2016 Spring American Water Resources Association (AWRA) Conference, Anchorage.** Sheraton Hotel. For info: www.awra.org/meetings/Anchorage2016/

**May 2-6 FL**
**10th National Monitoring Conference: Working Together for Clean Water, Tampa.** Sponsored by the National Water Quality Monitoring Council (NWQMC). For info: http://acwi.gov/monitoring/conference/2016/index.html

**May 3 NV**
**Hydrology & Water Management Seminar, Reno.** TBA. For info: Law Seminars Int'l, 800/ 854-8009, registrar@lawseminars.com or www.lawseminars.com

**May 3-4 TX**
**Environmental Trade Fair & Conference, Austin.** Convention Ctr. Sponsored by Texas Commission on Environmental Quality. For info: www.tceq.texas.gov/p2/events/etfc/etf.html

**May 16 WA**
**Environmental Due Diligence Seminar, Seattle.** TBA. For info: Law Seminars Int'l, 800/ 854-8009, registrar@lawseminars.com or www.lawseminars.com

**May 18-20 CA**
**California Water Ass'n 2016 Spring Conference, Sacramento.** The Citizen Hotel. For info: www.calwaterassn.com/upcoming-conferences/

**May 23-26 LA**
**AWEA Wind Power 2016 Conference & Exhibition, New Orleans.** Presented by American Wind Energy Ass'n. For info: www.windpowerexpo.org/index.aspx?&RDtoken=22301&userID=

**June 1 ID**
**National Climate Boot Camp: Tribal Needs & Concerns Related to Climate Change, Moscow.** University of Idaho. Presented by USGS & University of Idaho. For info: www.usgs.gov/newsroom/article.asp?ID=4320#.VhQe5ygqY-Y

**June 19-22 IL**
**ACE16 - American Water Works Association Annual Conference and Exposition, Chicago.** McCormick Place. For info: www.awwa.org/conferences-education/conferences/annual-conference.aspx