Irrigation Leader

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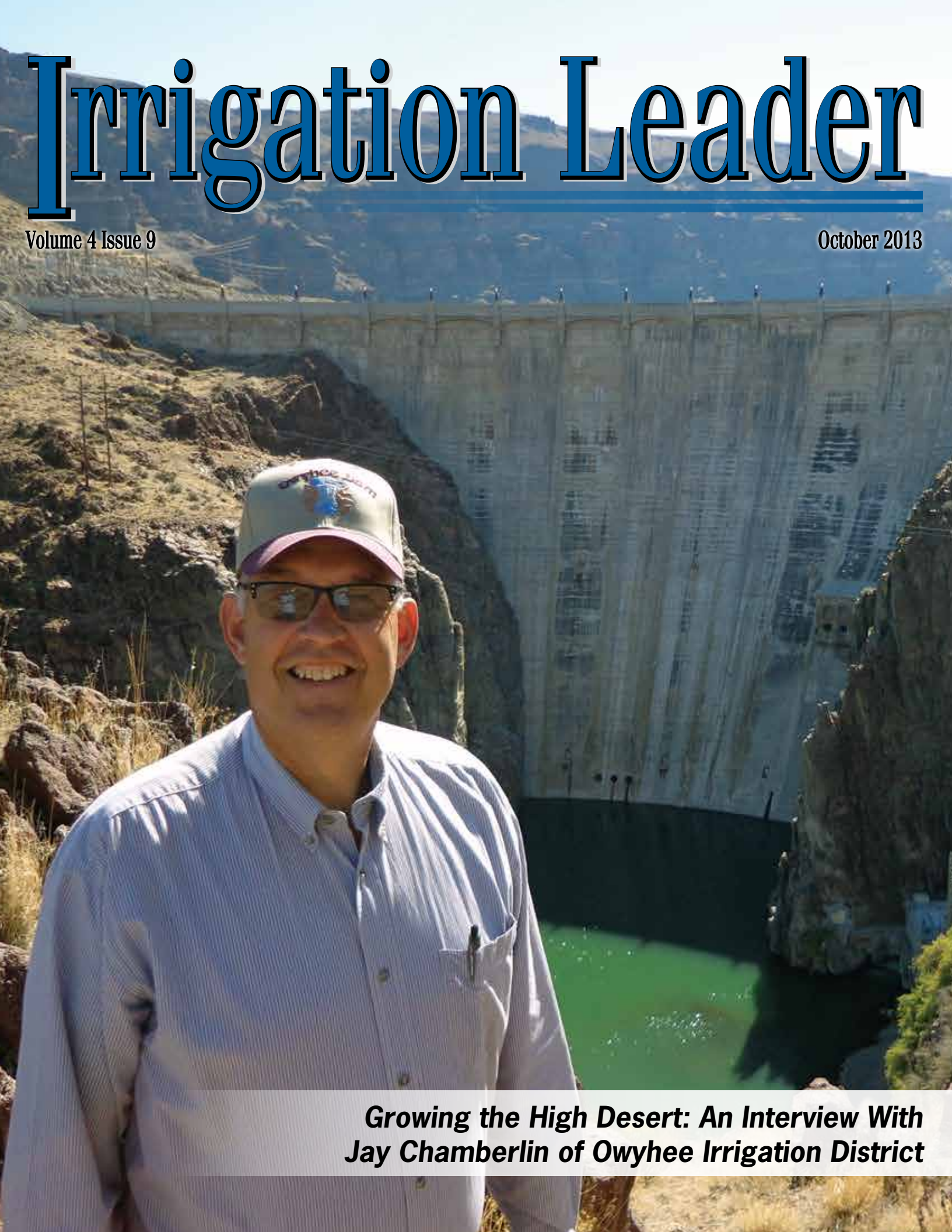

Growing the High Desert: An Interview With Jay Chamberlin of Owyhee Irrigation District

A Noble Cause

By Kris Polly

I have known Jay Chamberlin, general manager of the Owyhee Irrigation District, for 20 years and was especially pleased when he agreed to be interviewed and be on the cover of the October issue of *Irrigation Leader*. Jay is an accomplished manager, and it was a given he would provide an interesting interview. His final answer resonated with me: "I've dedicated my life to this work, and I can honestly say that it is a noble cause. This work is about the people—the people on the ground and the people at the Bureau of Reclamation. The work of the Bureau of Reclamation has made the desert blossom like a rose into a productive agricultural community."

Jay is absolutely right. Keeping water on the fields for our farmers and in the pipes for our cities is a noble cause. It has been my experience that "the people on the ground" and all those involved in irrigation and water are some of the most dedicated, hardest working, and brightest professionals.

This issue of *Irrigation Leader* focuses on Oregon, and like our prior issues, it shows the tremendous caliber of the people who work in water. Congressman Greg Walden shares his common sense; April Snell reports on the key issues facing the Oregon Water Resources Congress; Tim Culbertson educates us about the Columbia River Treaty; Katie Ruark talks about the resourcefulness of the Desert Water Agency; Chuck Sensiba and Michael Pincus talk about needed post-hydropower legislation steps; Mark Stuntebeck updates us on the Klamath Irrigation District; Don Glaser shares his experiences with Reclamation; Don Chandler of the Farmers Irrigation District is in our "Board Member Profile"; Dave Filippi and Tony Willardson discuss important issues in our "Water Law" section; and, finally, a company with a great American history, The James Leffel & Co., is spotlighted in our "Innovators" section.

Jay also mentions the good work of Reclamation. According to Reclamation statistics, Reclamation projects "deliver water to more than 31 million people, and provide one out of five Western farmers (140,000) with irrigation water for 10 million acres of farmland that produce 60% of the nation's vegetables and 25% of its fruits and nuts." Additionally, Reclamation's 53 hydro power plants "annually provide more than 40 billion kilowatt-hours generating nearly a billion dollars in power revenues and produce enough electricity to serve 3.5 million homes."

Irrigation and hydropower are an undeniable value to our economy and to our country. The work to maintain and improve irrigation and hydropower is truly a noble cause.

Kris Polly is editor-in-chief of Irrigation Leader *magazine and president of Water Strategies, LLC, a government relations firm he began in February 2009 for the purpose of representing and guiding water, power, and agricultural entities in their dealings with Congress, the Bureau of Reclamation, and other federal government agencies. He may be contacted at Kris.Polly@waterstrategies.com.*

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Hard copies of *Irrigation Leader* are mailed to the nearly 650 irrigation district general managers and their respective boards of directors in the 17 western states; the U.S. Bureau of Reclamation; Congress; all western state legislators' and governors' offices; and a variety of western water-related organizations, engineering firms, and individuals. The magazine is supported by advertisements and does not have a subscription fee.

Since our debut issue in October 2010, our mailing list has more than tripled to over 12,000 individuals. An additional 1,000 readers receive e-mail notification when the magazine is posted to our website at www.WaterandPowerReport.com. *Irrigation Leader* is published 10 times a year, with July/August and November/December as combined publications.

If you are not receiving *Irrigation Leader* in the mail, please send your mailing address to Irrigation.Leader@waterstrategies.com, and we will be happy to add you to our distribution list.

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COVER PHOTO: Jay Chamberlin, general manager of the Owyhee Irrigation District, by Owyhee Dam. Photo by district staff.

CONTENTS

Growing the High Desert:
An Interview With Jay Chamberlin of Owyhee Irrigation District

Jay Chamberlin, general manager of the Owyhee Irrigation District (OID), oversees operations that deliver water to the dramatic high desert of eastern Oregon. OID serves 67,161 acres, diverting 560,000 acre-feet of water in a normal year to fields of corn, onions, sugar beets, hay, beans, peas, and grains.

The Bureau of Reclamation constructed the Owyhee Project to provide water to more than 120,000 acres in the Owyhee and Central Snake River Valleys of eastern Oregon and western Idaho. Reclamation began work on the storage dam and canal system in 1928 and first delivered water by gravity flow to the project lands in 1935. In addition, privately constructed pumping plants provide Snake River water to lower-lying project lands under a 1936 contract between Reclamation and several irrigation districts. Three hydropower facilities—at Owyhee Dam, at a diversion tunnel, and on a major lateral—generate a total of 15 megawatts of power.

The Owyhee Dam is an engineering marvel. At its dedication in 1932, the dam was the world's tallest. Standing 417 feet from the riverbed, it was the first dam in the nation to have an elevator and served as a prototype for Hoover Dam. More than half a million yards of concrete went into the semiarched gravity dam.

Jay started his career in water at OID right out of high school in the late 1970s. After working in the district for 6 years, he got the opportunity to go to Montana and manage a couple of projects: the Bitterroot Irrigation District for 6 years and the East Bench Unit for 11 years. Jay returned to manage OID in 2001 and has been there ever since. Jay spoke with Irrigation Leader *magazine's editor-in-chief, Kris Polly, about water supply, water quality issues, and being on the forefront of adopting new technologies.*

Kris Polly: What key issues are facing the district?

Jay Chamberlin: Water availability and water quality. Flood irrigation predominates the area, but new technologies, like microirrigation, are becoming more prevalent. Growers who have the financial ability to put together large blocks of land are moving into this area.

This part of eastern Oregon has just been agriculture: that is what we are about and it hasn't changed for many, many years. We have a federal storage facility in the Owyhee Dam and a relatively stable area of high-desert drainage into the reservoir totaling 11,000 square miles, covering parts of Nevada, Oregon, and Idaho. We are

Two members of the OID rappel team making their way down the face of Owyhee Dam.

Ring Gate, Owyhee Dam Spillway.

susceptible to changes in snowpack, which is why we store 1,200,000 acre-feet of water—if all goes well, we have two years of water supply. Now, going into the third consecutive year of drought, [water supply] is looking tight next year unless we have a good snow year.

Front and center for us over the last few months are the proposed FDA [Food and Drug Administration] water quality standards as applied to fresh fruit. This is a concern because the area produces more onions at certain times of the year than any other part of the nation. I think that the *E. coli* standards [FDA] is considering are set too high. They are recreational standards, not growing standards.

FDA [representatives] toured our area last month. They started off in Boise, Idaho, and we met up with them to tour the Boise Project and some of our sister organizations across the river. The tour was an eye-opener for the FDA representatives. Onions in our area are not sprinkled—they are flood or drip irrigated. Water contact with the bulb itself is rare. We got them out in the field and showed them how the onions dry in preparation for loading and processing.

Two drainages fall within our district and are subject total maximum daily load requirements. So there is pressure on agriculture to clean up the water. The challenge is that OID is located in real canyon land, in which we only get 6 to 12 inches of precipitation annually. This year, we are in the 3.5- to 4-inch range. Needless to say, no water goes unused.

To get the water from the reservoir to agricultural lands, it has to travel through 3 miles of tunnel. The tunnel comes out of the canyon and bifurcates, sending part of that water to Idaho through a 5-mile tunnel and part up north to us through canyon country. Our main canal is 70 miles long. We recapture that water two or three times off the fields, and then another irrigation district below us will recapture that. It is hard to keep water quality high when it is recaptured and reused so many times.

Kris Polly: What projects are you working on?

Jay Chamberlin: We've been working on canal automation since I started here. This is an open, gravity-flow system for the most part. We are working to move water through that system more efficiently. The Bureau of Reclamation has been a great partner, first through the Water Conservation Field Services Grant Program and then with WaterSMART.

We have an 85-year-old system, and we are tying on the

newest technologies to parts of it. It is like putting new tennis shoes on an 85-year-old man and asking him to run a marathon. We still have a lot of concrete structures situated at a steep slope that need to be replaced. The main canal needs a lot of rehab, but we're working in that direction. [OID's upgrades] have really stretched us, but we are seeing real benefits.

We have also been working on pressurizing our pipelines in areas of the project where there are some serious water quality problems. Water quality is so important because we have to ensure that a grower does not contaminate water for the next grower downstream. This past year, we installed about 4.5 miles of pipeline to help reduce field runoff. We'll complete that this fall, amounting to 5.5 miles of pressurized sprinkler systems covering 5,000 acres. We are using PVC pipe ranging from 30 inches on down. There has been so much work that we have subcontracted out some of the laying of the pipeline.

Most laterals are earthen. We have 500 miles of laterals on the system, so we work with the grower when he or she moves to pivot. In some instances, the district grower will buy the pipe and we will dig and lay it in the lateral, then reclaim the lateral. We are working hard to catch up with technology and work hand in hand with the irrigators. Because of drip and sprinkler irrigation—which services roughly 50 percent of our growers—we have been able to stretch out the water in times of drought.

Kris Polly: Do you have a lot of pivots going in?

Jay Chamberlin: We do—a tremendous amount. We are averaging 15 to 20 on the system every year. Labor and water savings are driving installations. As long as money is available through WaterSMART, EQIP, or Oregon Water Enhancement Board grants, installation will continue here in the valley.

Kris Polly: How are you keeping track of your water?

Jay Chamberlin: Everything is measured. Of course, it is much easier to measure and manage in pipe. You are always trying to improve your measurements. What has really helped us is the use of laptops in the field and TruePoint solution's accounting system in the office. Both have been very valuable in dry years such as this.

Growers, particularly those using drip irrigation, are micromanaging water more than ever before. With the TruePoint accounting system, we are able to do that daily in a more accurate and timely manner. Our ditch riders download that information to the office every day. Our next step is go with TruePoint's additional program that would enable our growers to access that information through the Internet.

Rappel team multiagency training drill.

There is only so much water to go around, and volumes change every year. This year, we delivered two-thirds of our growers their normal allotment of water; next year, we don't know what that number will be. If we hadn't adopted the technology to improve our measurements, we would be in real trouble. The end result is that the technology enables us to continue to provide the grower with the water he or she needs to grow crops to feed the country and the world.

Kris Polly: Given the dramatic terrain of the area, describe some of the infrastructure safety programs in place.

Jay Chamberlin: Because of our tunnels and vertical challenges, particularly our inverted siphons, we have a regimented inspection program. OID has a rappel team that is trained in rescue and recovery in case of emergency. They have even rappelled all 470 feet from the top of the [Owyhee] dam. Safety is of the utmost importance to us.

Kris Polly: What is the most important thing you have learned as a manager?

Jay Chamberlin: I've dedicated my life to this work, and I can honestly say that it is a noble cause. This work is about the people—the people on the ground and the people at the Bureau of Reclamation. The work of the Bureau of Reclamation has made the desert blossom like a rose into a productive agricultural community. It has been fun to be part of an industry that is evolving in a very positive way and to see how my staff has taken up the challenges of water conservation and efficiency.

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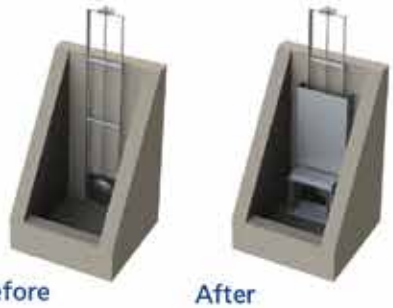

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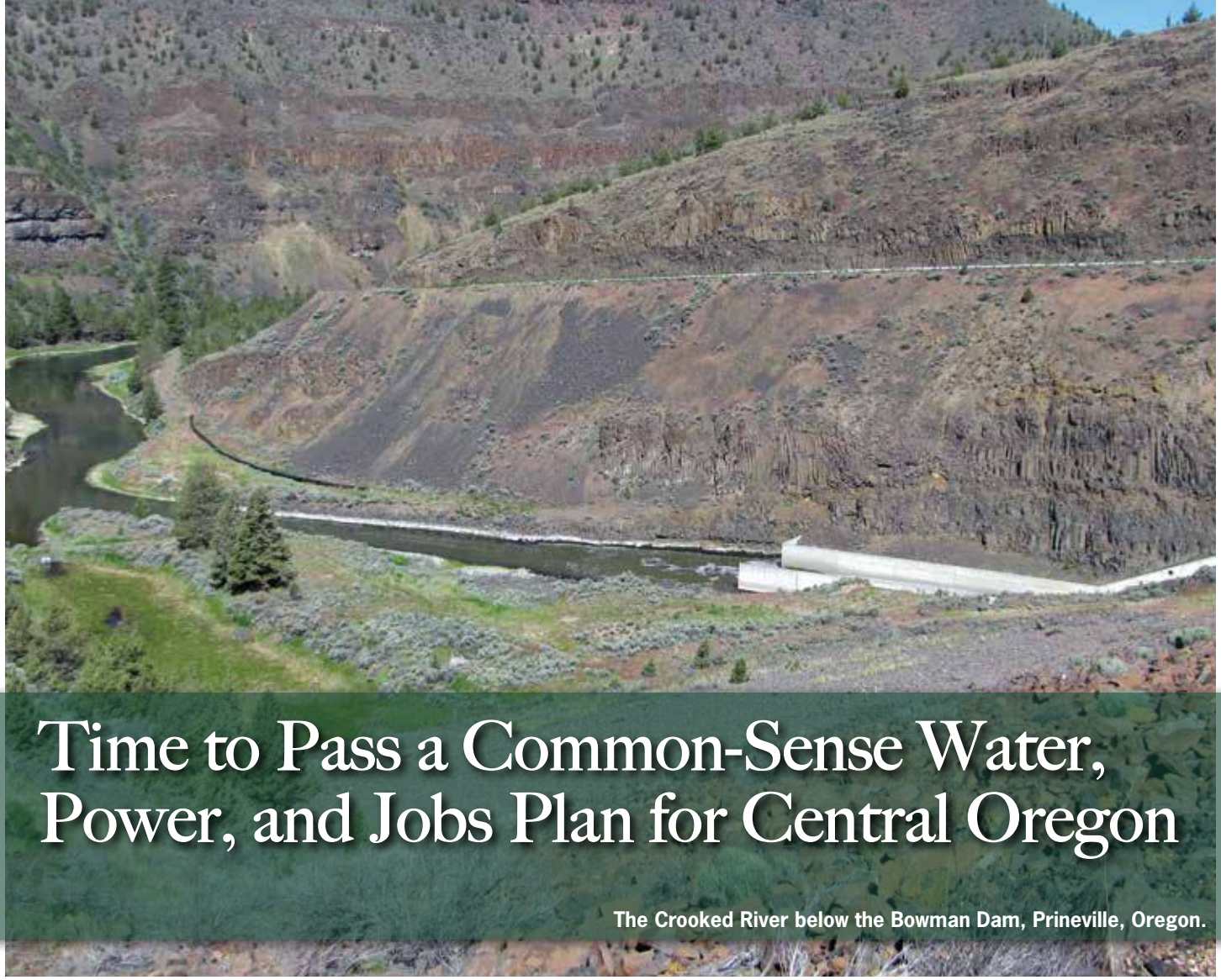


Time to Pass a Common-Sense Water, Power, and Jobs Plan for Central Oregon

The Crooked River below the Bowman Dam, Prineville, Oregon.

By Congressman Greg Walden

Is there anything wild and scenic about a dam? Nothing—unless you're falling off the side.

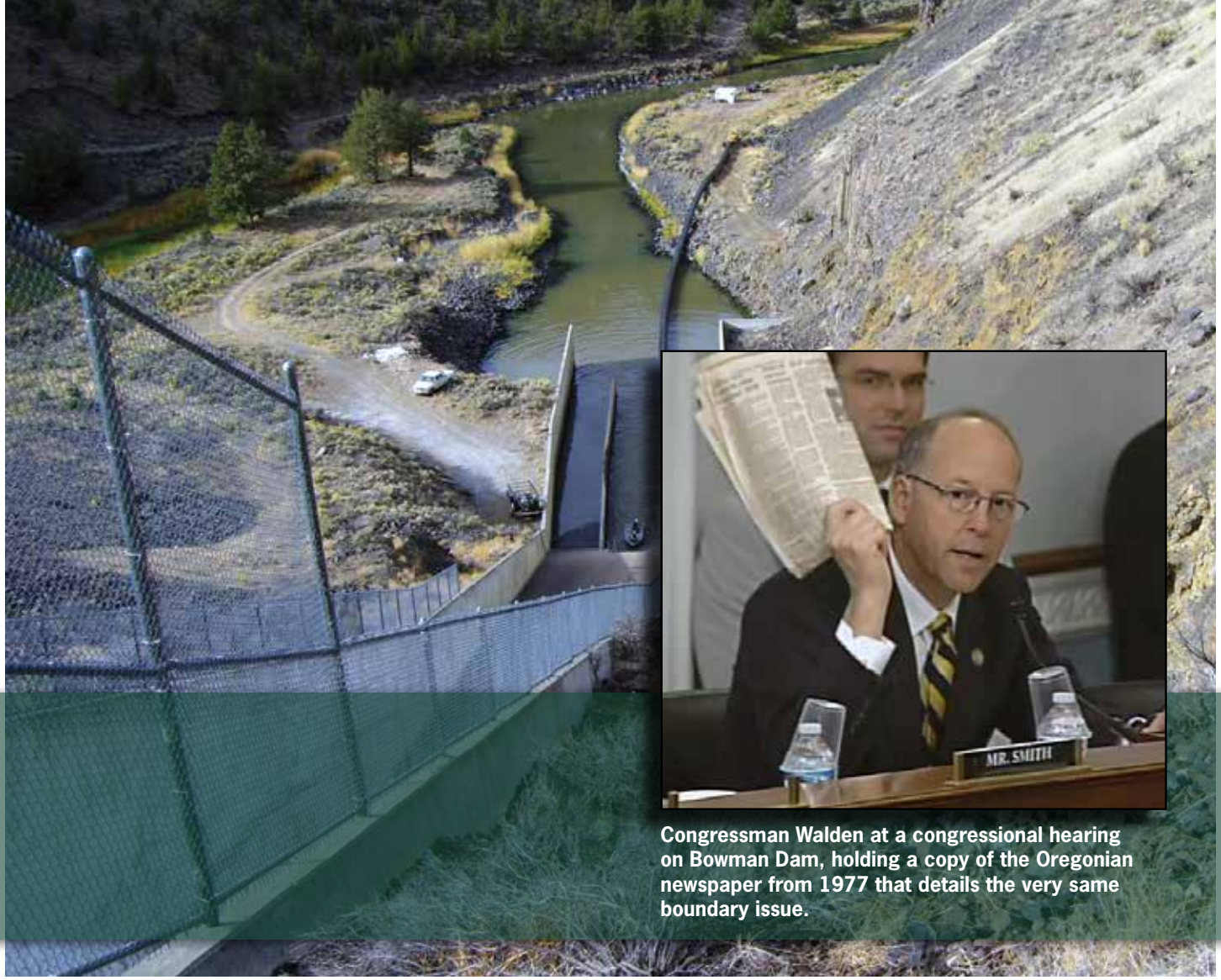
When the maps for the Crooked River Wild and Scenic Area in central Oregon were drafted by the Bureau of Land Management decades ago, the agency made an error. The boundary line for the protected wild and scenic area runs right down the middle of the Arthur Bowman Dam. And that simple map error—basically a typo—is holding back job creation in Crook County, Oregon, and its county seat of Prineville.

There are utilities that have expressed an interest in building small-scale hydropower at the base of the dam, which would create good-paying jobs for Prineville and enough clean energy to power 4,500 homes. But they can't build the project because the dam is inside the wild and scenic river area and, accordingly, is protected as if it were one of God's wonders. So we've got a problem on our hands.

As a small business owner for over two decades, when I saw a problem, I would just go ahead and fix it. That's what we do with our lives every day. See a problem, fix the problem. But unfortunately, to fix this typo on the maps and bring these jobs to Prineville, we need Congress to pass a law. I've introduced a bill in Congress to do just that—the Central Oregon Jobs and Water Security Act.

Here's another problem: Crook County has an unemployment rate of 12.6 percent, one of the highest in the state. Solution? Give citizens there the tools they need—water and power—to foster more economic growth. Facebook has built, and recently expanded, a major data center in Prineville. Apple is currently building one of its own. Prineville is on the verge of becoming a hub for data centers. But to do this, the city needs more water.

My bill would allow Prineville to access roughly 5,100 acre-feet of water from the reservoir behind the dam. That extra water would allow the city to tell prospective companies, "Bring your business and jobs to Prineville. We have the water you need." The extra allocation represents a small fraction of the 80,000 acre-feet of uncontracted water behind the dam. It also would allow the city to provide water to an additional 500 homes within city limits, which it cannot currently do because its



Congressman Walden at a congressional hearing on Bowman Dam, holding a copy of the Oregonian newspaper from 1977 that details the very same boundary issue.

mitigation credits are maxed out.

Because the city would access the water through the ground and not from directly behind the dam, the extra allocation would increase the minimum release of water from Bowman Dam by up to 7 cubic feet per second. In dry years, particularly in the winter, this higher release requirement could benefit fish and wildlife, including the blue-ribbon trout fishery below Bowman Dam.

We've worked with local irrigation districts to include "first fill" language in the bill. This section ensures that existing contracts between irrigation districts and the federal government are met prior to the use or release of stored water behind the dam for any additional purpose.

Another part of my legislation aims to speed up the McKay Creek restoration project. This good project restores flows in McKay Creek, which will provide for a better habitat for steelhead.

This is a simple bill. It is no cost to the taxpayers, would create new job opportunities through additional water allocation and new clean energy, and would not impact the unique qualities of the wild and scenic area.

Last year, my bill was approved unanimously by the House of Representatives, but the clock ran out before it could be approved by the Senate. I look forward to moving it swiftly through the House again and working with the Senate and the White House to get this signed into law as soon as possible.

This plan is exactly the kind of legislation our country needs. The American public wants common-sense energy and water solutions that protect the natural environment and make our country more energy independent. And it needs the tools necessary to create jobs and attract new businesses. This simple legislation does all of that. We can pass this common-sense measure and get water, power, and jobs to the people of central Oregon.

Congressman Greg Walden represents the people of Oregon's 2nd Congressional District, which includes 20 counties in central, southern, and eastern Oregon.

Line irrigation on a farm within the Ochoco Irrigation District, central Oregon.

Oregon Water Resources Congress

By April Snell

The Oregon Water Resources Congress (OWRC) is a nonprofit trade association representing irrigation districts and other agricultural water suppliers that deliver irrigation water in Oregon. Our district members deliver water to more than 560,728 acres of farmland statewide, roughly one-third of all irrigated land in Oregon.

Since 1912, OWRC has promoted the protection and use of water rights and the wise stewardship of water resources in the state of Oregon. OWRC's primary activities are centered on advocacy at the state and federal level and on providing educational opportunities for agricultural water suppliers. We promote legislative changes to meet the members' needs, testify at natural resource agency hearings and rulemakings, and engage in other forums where water issues are the agenda. We also act as a conduit of information, constantly collecting feedback on what our members need while simultaneously keeping our members informed about changes that impact agricultural water delivery, ranging from new laws and regulations to new technologies and best management practices.

Current Key Issues

Infrastructure. Many of our members' facilities were built 50 to 100 years ago. Those projects were built at time when our country was investing in water supply and other civil works. As a nation, we have not continued the investment needed to ensure that those facilities are adequate to meet current needs and future demands. In Oregon, as in other states, there are not a lot of opportunities for state or federal funding to address aging infrastructure. That means rehabbing old components; putting in more efficient technology; expanding existing storage; and building new innovative storage to provide a more reliable water supply for agricultural, municipal, and environmental needs. If you throw in the specter of climate change and its potential impacts, it makes the need for storage that much more important.

Fish Recovery. Oregon has numerous sensitive, endangered, or threatened species of fish, and many of our members have to address fish needs in district operations and management. We have been seeking additional funding for fish screens and fish passage to address environmental needs. In 2000, Senator Wyden helped create a cost-share program through the Fisheries Restoration and Irrigation Mitigation Act (FRIMA) to provide federal funding for the U.S. Fish and Wildlife Service to support efforts for salmon recovery in Oregon, Washington, Idaho, and western Montana. Unfortunately, its authorization has expired, so we are seeking other ways to continue to help fund those efforts. Partnership and collaboration have proved to be far more effective than fighting in reconciling environmental needs and agricultural needs.

Hydropower. Many OWRC members are interested in or are actively pursuing renewable hydropower projects. We actively supported recent bipartisan federal legislation, H.R. 267, the Hydropower Regulatory Efficiency Act of 2013, and H.R. 678, the Bureau of Reclamation Small Conduit Hydropower Development and Rural Jobs Act, which will provide more opportunities for the development of in-conduit hydropower. At the state level, we have

supported legislation that enables small hydropower applicants to pay into a fund for fish passage statewide instead of having to pay for it up front, which can make the project financially infeasible. We are excited about the potential for small hydro to provide extra revenue for the districts to improve infrastructure while generating clean renewable energy. However, it is very important that these small hydro projects pencil out; otherwise, none of the numerous benefits will be realized.

Water Quality. One of the newer issues we are addressing is agricultural water quality. New water quality regulations, increased scrutiny on nonpoint sources, and legal challenges to how state agencies implement the Clean Water Act create a complicated setting for agricultural water management. The Food and Drug Administration's (FDA's) proposed rule changes under the Food Safety and Modernization Act, which could potentially require districts to test and treat water for *E. coli*, pose significant challenges for our districts. Food safety is just the tip of the iceberg of challenges agricultural communities face related to nonpoint-source water quality issues.

In another example, some of our districts have had to deal with urban entities dumping untreated stormwater into canals without any agreement or compensation to the district. These situations have created a variety of liability issues for our members and, in some instances, have led to costly litigation that threatens the districts' ability to continue to deliver water to their patrons. We will continue to explore legislative and legal solutions but are also looking to develop some best-management practices and provide training on water quality. Runoff-related issues have been cropping up over the years, and we are trying to work with other entities that have similar issues to have a collaborative approach to these issues.

However, we also need to get legislators and state and federal agency staff to visit different districts around Oregon to show them the circumstances that relate to whatever the regulation or funding issue is. FDA staff, legislators, and state agency staff recently toured district and other agricultural operations in eastern Oregon as part of outreach related to the proposed food safety rule. The participants were able to see the on-the-ground realities and potential challenges with implementing the rule in a way that can never be replicated with written comments.

However, with increased scrutiny on government travel, these types of opportunities are increasingly rare. Given this fiscal climate and the scrutiny of government expenses, OWRC is going to have to look at how we can fund tours and trips and other opportunities to tell our story and showcase the importance of irrigated agriculture. This is something we have to do, because otherwise, legislators and agency officials will have no connection to how their decisions and programs actually affect agricultural interests. Irrigation districts run complex systems that require on-the-ground observation and experience to help develop a real understanding of how they work.

Columbia River Treaty. Next year, the State Department has to notify Canada as to what it plans to do with the treaty, which is set to expire in 2024. The process has been conducted, by and large, behind closed doors. Only recently have the Bonneville Power Administration and the U.S. Army Corps of Engineers attempted to include other stakeholders and interests. While they already have released some draft recommendations, another set of recommendations was expected around the end of September. We will be submitting comments on those recommendations to help ensure that agricultural needs are recognized.

The proposals contain a variety of potential effects for irrigators, ranging from using more American facilities for flood control—potentially spilling irrigation water from storage facilities to make room for flood-control water—to tribal requests for more work on fish passage that ignore work that has already been done along those lines. We also think that there should some allowances for increased water supply and the necessary authorizations to facilitate conversations about those options. There are a lot of opportunities for increasing the amount of water available through the Columbia River system for irrigation, municipal, and environmental needs.

Looking Ahead

OWRC is working to develop stronger relationships, not only with other natural resources groups within the state but also with municipal and environmental organizations, to address our mutual water needs. We want to move away from an "us against them" mentality, because the reality is that we are all facing similar challenges. Solutions can be found in the middle, and we are going to continue to push conversations and policies in that direction. So while we continue to face a myriad of challenges, OWRC has a huge opportunity to continue representing irrigated agriculture and increasing its profile, whether through legislative advocacy or enhanced education and training.

April Snell is OWRC's executive director. April can be reached at (503) 363-0121 or aprils@owrc.org.

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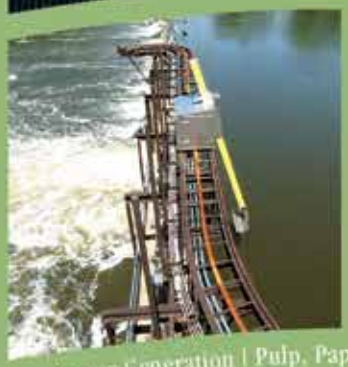

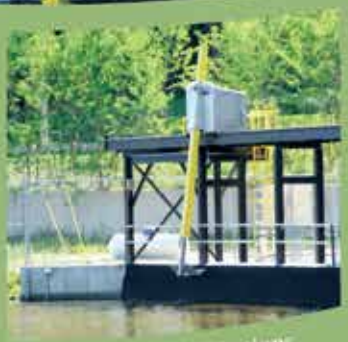

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THE COLUMBIA RIVER TREATY:

A Treaty Between the United States and British Columbia Established as a Multiuse Resource for the Northwest

By Tim Culbertson

The Columbia River flows through Canada and the United States, but its headwater lies high in the Canadian Rockies. In the late 1940s, that led to a big problem for both countries. Disastrous flooding took place along the length of the river, from British Columbia to the river's mouth near Astoria, Oregon. The city of Vanport, which was Oregon's second-largest city at the time, was destroyed, and more than 50 lives were lost. This event was the impetus that led to the discussions between officials of both British Columbia and the United States. The desire was to reduce impacts from flooding and to increase power production to meet the energy loads in the region.

While discussions took place in earnest, they at best were very complicated, and the Columbia River Treaty was not signed until 1961 and implemented in 1964. The two main components of the treaty provided for British Columbia to construct three dams in British Columbia. The Canadian facilities vastly reduced flood risk in the United States, while enabling the production of significantly more electricity at the downstream hydroelectric facilities in the United States. The United States paid Canada $64 million for 60 years to support assured flood control through 2024. Along with the three dams built in Canada (Duncan, Mica, and Keenleyside—also known as Arrow in the United States), the construction of Libby Dam in Montana doubled the amount of water that could be stored for flood control. It should be noted that regardless of whether the treaty continues, post-2024 flood control will change to a concept known as *called upon*. There is disagreement between Canada and the United States over what *called upon* means and how it will be implemented.

The treaty storage has been put to good use over the years. A recent example of the treaty storage capacity being used was the high water event of 1996, when a rain event caused most of the Northwest rivers to run very high and dam operators restricted flows from the upper Columbia Basin, so that the water from the Willamette River could run through Portland without a flooding event.

As part of the treaty, the United States also committed to paying half of the incremental power benefits that could be derived from how the Columbia River flows would be managed. The treaty dams help smooth out the seasonal flows of the Columbia River, which allows them to release water in the fall and winter to meet power demand and then to store water in the spring that prior to the treaty would have potentially caused flooding. The share of the power generation known as the Canadian entitlement is delivered from the United States to Canada. The value of the energy returned to Canada is estimated at $250 million to $350 million per year as calculated by the Bonneville Power Administration. All electric customers in the Northwest are directly affected by this obligation to Canada through the rates they pay to their serving utilities.

While the treaty has no official end date, either country may unilaterally terminate the treaty from September 2024 forward provided that at least 10 years' notice is given. Therefore, the first possible date that either county could give notice to terminate the treaty is 2014. This date provided the impetus for both countries to engage in much dialog within their respective countries, as well as with each other. Given that this is an international treaty, the U.S. Department of State manages the treaty. State

will receive input in the form of a recommendation from the general of the Army Corps of Engineers, Northwest Division, and the administrator of the Bonneville Administration, known as the United States Entity, by the end of 2014. At this point in time, there is no regional consensus on what the region should recommend.

The United States Entity convened a process or group called the Sovereign Review Team that consists of one member from the Northwest Power and Conservation Council from each of the four northwestern states, tribal members representing the 14 northwestern tribes, and state and federal agencies. There are many other stakeholders in the region that were not invited to participate on the Sovereign Review Team. Most obvious as having been left out of this process are the utilities of Chelan, Douglas, and Grant County Public Utility Districts, as well as the irrigation districts of the Columbia Basin Project. Many of those left out of the Sovereign Review Process are directly affected by the Columbia River operations.

The key issues for consideration by the United States Entity are the Canadian entitlement, flood control, and a third ecosystem-based function that was not part of the original treaty. The Canadian entitlement is out of balance and needs to be rebalanced to realize the benefits that the United States is actually receiving under the treaty. Technical analysis shows that the United States actually receives about one-tenth of the benefits that were envisioned when the treaty was signed. With respect to flood control, the parties need to resolve the measures necessary to implement in the United States before they can use called-upon flood control in Canada. Ecosystem-based functions are environmental attributes that include streamflows, water quality, and cultural- and natural-resource impacts. However, many of these functions are already being addressed, and the Bonneville Administration alone spends in excess of $700 million annually on these programs. The number for the entire Northwest would be well above $1 billion annually, and it is not known what additional ecosystem-based functions that others want included in the treaty.

What is most important to irrigators in the Columbia Basin Projects is to protect their existing water rights, which includes a preexisting water right for future development of the Columbia Basin Project. There is a water right for another 3 million acre-feet to further develop the project for a total development of 1.2 million acres. Also of concern to the irrigators in providing for flood control in the United States is that Lake Roosevelt not be drafted so low in the spring and summer months to the extent that there is a lack of pumping capability to supply water for irrigation in the project.

As the region considers these issues, it is absolutely necessary that there be much broader participation by involved stakeholders that are affected by these issues so that the region, with its broad range of interests, can reach a level of consensus on the Columbia River Treaty.

Tim Culbertson is the secretary-manager of the Grand Coulee Project Hydroelectric Authority. Tim can be reached at (509) 754-2227 or TCulbertson@gcpha.org.

Desert Water Agency Harnessing the Sun to Recycle Water

Expansion project nearly triples solar power generation

By Katie Ruark

In a region known for its year-round sunshine, harnessing the power of the sun is a win–win for the Desert Water Agency (DWA), headquartered in Palm Springs, California.

DWA serves a 325-square-mile area of some of the sunniest communities in California, so solar power has been an integral part of its operations since 2005. This year, it expanded that solar operation to triple its solar-generating capacity—producing even more savings for ratepayers and further reducing the agency's carbon footprint.

DWA's solar expansion project added 715 kilowatts to its existing 355-kilowatt solar array by installing 2,424 new solar panels and other related equipment. The project is expected to generate more than 1 million kilowatt-hours and save the agency $3 million to $4.1 million over 25 years.

The project will augment the solar power already fueling the agency's water recycling program—a major component of its water conservation efforts. Through its recycling program, DWA saves energy and millions of gallons of drinking water by providing recycled water to irrigate golf courses, parks, medians, and Palm Springs High School's athletic fields.

"At DWA, we are committed to conservation and sustainable management," said Joseph Stuart, DWA board member. "Expanding the solar-generating capacity for our recycling plant is another example of that commitment

Craning in a prefabricated concrete block building.

Solar racking installation.

and builds on the strong history DWA has of innovative and responsible management of the Coachella Valley's water resources."

DWA installed the original solar field at its Operations Center in the spring of 2005. It is a ground-mounted fixed-tilt system about the size of a football field. It includes 2,028 Shell PowerMax™ Ultra modules for greater efficiency and enhanced performance. There are 338 Shell Solar factory-assembled panels for lower installation costs and greater reliability.

Before completion of its solar power expansion, DWA was producing 662,000 kilowatt-hours annually, or enough energy to power about 100 homes for a year or pump 3,800 acre-feet of water annually. The agency spent $2.5 million on the field in 2005, but costs were significantly reduced because Southern California Edison awarded the agency a $1.2 million contribution from its Self Generation Incentive Program.

DWA also produces power through two hydroelectric generating plants—and has been doing so since 1987. One is in Whitewater Canyon and the other is at Snow Creek. The Snow Creek facility generates power from water flow from the creek, and the Whitewater Facility generates power from water flow from the Colorado River Aqueduct.

In 2011, DWA generated more than 7 million kilowatt-hours of electricity with the two plants. However, because they are dependent on stream flow and Colorado River deliveries, energy generation can vary greatly each month.

"The solar field expansion project is another example of DWA planning for the future in a wise and sustainable way," said board member Jim Cioffi. "Expanding the agency's solar-generating capacity is not just the right thing to do; it will help us to continue our long history of keeping low, stable rates for all of our customers."

Katie Ruark is the public information officer for Desert Water Agency and a native to the Palm Springs area. To contact Katie, call (760) 323-4971 or email kruark@dwa.org.

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New Hydropower Laws for Irrigators: *New Challenges and Opportunities*

By Chuck Sensiba and Michael Pincus

On August 9, 2013, President Obama signed the Hydropower Regulatory Efficiency Act of 2013 (Hydropower Efficiency Act) and the Bureau of Reclamation Small Conduit Hydropower Development and Rural Jobs Act (Reclamation Conduit Act) into law. These related laws are designed to reduce regulatory barriers to low-head hydropower development at existing infrastructure, particularly existing irrigation canals and other water conveyance conduits. If implemented properly, these new statutes could spur growth in low-head hydropower resources.

Many provisions in these new statutes, which are summarized below, are self-executing and require little additional input from the regulated industry and public. However, two aspects of the new laws will require active engagement of irrigation and water districts in their implementation:

1. The Federal Energy Regulatory Commission (FERC) is required by the Hydropower Efficiency Act to investigate the feasibility of establishing a two-year process for licensing hydroelectric projects at nonpowered dams and closed-loop pumped storage, and FERC has solicited participation from the industry in meeting this requirement.
2. The Reclamation Conduit Act creates jurisdictional uncertainty between FERC and the U.S. Bureau of Reclamation for small conduit hydropower development at Reclamation facilities, requiring FERC and Reclamation to clarify this uncertainty.

This article provides a detailed description of the new opportunities for low-head hydropower development created by these two new statutes and the provisions of the new law that will require irrigation and water district engagement.

Hydropower Regulatory Efficiency Act of 2013

The Hydropower Efficiency Act is intended to reduce regulatory burdens on hydropower development by eliminating FERC's jurisdiction over certain classes of small conduit hydro development and expanding the types of hydropower projects that qualify for a less time-consuming and efficient "exemption" authorization. Specifically, the law:

- Excludes from FERC's mandatory licensing jurisdiction hydropower facilities of 5 megawatts (MW) or less located at nonfederal conduits, and which meet other specified criteria;
- Increases the capacity limit (from 15 MW to 40 MW) and eliminates the federal land ownership restriction for facilities at nonfederal conduits that qualify for a FERC exemption authorization;
- Increases the capacity limit (from 5 MW to 10 MW) of projects that qualify for a FERC small hydropower exemption authorization;
- Authorizes FERC to extend preliminary permit terms by two years (beyond the three years authorized under the Federal Power Act), for a total term of five years; and
- Requires FERC to investigate the feasibility of establishing a two-year process for licensing hydropower projects at nonpowered dams and closed-loop pumped storage projects.

Many of these provisions of the Hydropower Efficiency Act are self-implementing. In fact, FERC has established a website (http://ferc.gov/industries/hydropower/indus-act/efficiency-act.asp) to provide guidance to developers on how to file the required notice of intent for a qualifying conduit facility, apply for a small hydropower exemption, and seek a preliminary permit term extension.

FERC's investigation into the feasibility of developing a two-year licensing process for nonpowered dams and closed-loop pumped storage, however, will require significant public involvement. FERC has scheduled a workshop for October 22, 2013, where it intends to discuss, among other things:

- Feasibility of a two-year process;
- Eligibility criteria for a potential two-year process;
- Actions already implemented to shorten license application process times;
- The scope of FERC's environmental review under the National Environmental Policy Act (NEPA); and
- How to engage federal and state resource agencies in a more abbreviated process.

This public process, which includes the opportunity to submit written comments by November 21, 2013, is an important opportunity for low-head hydropower developers to work with FERC to identify solutions to current regulatory barriers to hydropower development. Because the current licensing process can take at least five years (and sometimes significantly longer), a two-year process would reduce regulatory costs and increase the potential for near-term revenue following project development.

Bureau of Reclamation Small Conduit Hydropower Development and Rural Jobs Act

Enacted on the same date as the Hydropower Efficiency Act, the Reclamation Conduit Act also is meant to reduce regulatory burdens by seeking to clarify Reclamation's role in developing small conduit hydropower at Reclamation facilities. The Reclamation Conduit Act:

- Provides that Reclamation authorizations of leases of power privilege (LOPP) at Reclamation facilities are in addition and alternative to any authority in existing laws related to particular projects, including small conduit hydropower development;
- Requires Reclamation to first offer the LOPP to an irrigation district or water users association operating the

applicable conduit, or to the irrigation district or water users association receiving water from the applicable reserved conduit;
- Encourages hydropower development on Reclamation facilities by providing that these projects are categorically exempted from NEPA review; and
- Designates Reclamation's Power Resources Office as the lead office of small conduit hydropower policy and procedure-setting activities.

Reclamation's implementation plans for the Reclamation Conduit Act are not yet clear. One major issue requiring clarification is the uncertainty created by this new law related to the division between FERC and Reclamation in approving small conduit hydropower at Reclamation facilities. A 1993 memorandum of understanding (MOU) between Reclamation and FERC establishes guidelines for determining jurisdiction for approving proposed hydropower projects at Reclamation facilities. Under the MOU, if the statute authorizing the Reclamation project or related documents mention hydropower development as a project purpose, then FERC has jurisdiction over the project. If, however, the authorizing statute or incorporated documents specifically reserve hydropower development exclusively to the United States (or specifically withdraws FERC's jurisdiction), then Reclamation has jurisdiction over the project.

The Reclamation Conduit Act, however, creates considerable uncertainty as to whether it reserves to the United States the exclusive authority to develop small conduit hydropower facilities below 5 MW at Reclamation facilities. The text of the law appears to do nothing more than clarify that Reclamation has jurisdiction to issue LOPP authorizations exactly as provided in the MOU. However, other language in the new statute, as well as some of the legislative history, suggests that the Reclamation Conduit Act shifts jurisdiction for the approval of all small conduit hydropower development at Reclamation facilities from FERC to Reclamation.

Because this uncertainty could delay proposed hydropower development at Reclamation facilities, both ongoing and planned, there is an immediate need for FERC and Reclamation to work together to resolve the jurisdictional uncertainties created by the Reclamation Conduit Act. Among other issues, FERC and Reclamation should address whether the Reclamation Conduit Act shifts jurisdiction to Reclamation where project-authorizing legislation did not reserve the United States' exclusive authority to develop hydropower at the project. The agencies also need to clarify how existing FERC-licensed projects and currently proposed new projects under a FERC-issued preliminary permit will be treated on an ongoing basis once the current license or permit expires.

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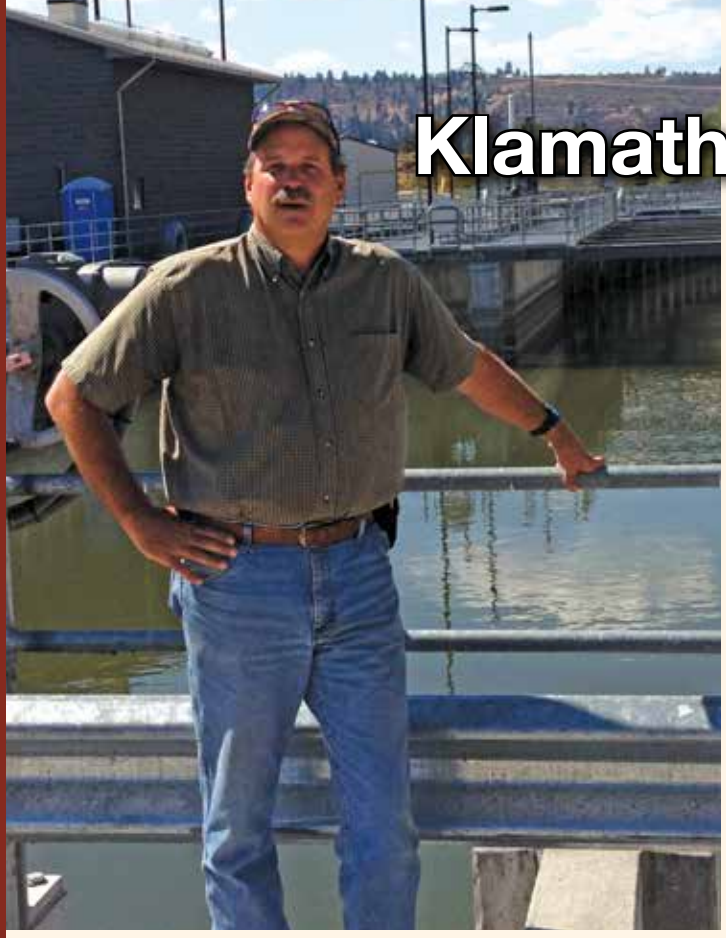
Klamath Irrigation District



Mark at KID's headworks and fish screen facility at "A" Canal.

By Mark Stuntebeck

Klamath Irrigation District (KID) delivers water to fields of alfalfa, pasture, barley, wheat, potatoes, and strawberry root stock in the high desert of south-central Oregon. While the district proper covers 40,000 acres, KID serves closer to 75,000 acres because we deliver to downstream irrigation districts pursuant to individual contracts with the Bureau of Reclamation.

Upper Klamath Lake, a natural lake converted into a reservoir, is our main storage resource; however, our water supply is wholly dependent on snow pack and season-long inflows to the lake. It feeds the Klamath River and the more than 200 miles of canals and laterals that compose KID's irrigation infrastructure. In a typical year, KID diverts 225,000 to 300,000 acre-feet for all of our users.

We have an amazing irrigation system, especially for an earthen, open-ditch system. A number of years ago, a study found that the project's water-use efficiency was upward of 90 percent. Our efficiency is high because of our ability to reuse water through our drainage system. Much of our operational spills and irrigation return flows end up in the Lost River system, which is the source of diversion for the Tulelake Irrigation District in northern California. KID has seven pump stations that can pick up these return flows and return them to the irrigation system. Any water left over can be returned to the Klamath River.

HISTORY

Reclamation initiated project construction in 1906 with the "A" Canal. By the winter of 1909, 23.5 miles of main canal and 47 miles of laterals delivered water to over 21,000 acres. Construction of the distribution and drainage systems continued through 1917. In March 1917, homesteaders first settled public lands within the project. Voters soon approved the formation of KID and entered into a contract with the United States for the repayment of the costs of project works.

In 1954, KID entered into an amendatory contract with Reclamantion, providing for KID to assume operation and maintenance of project infrastructure. Under this contract, KID is not only required to serve water to lands within its boundaries but also to serve water to other water users located within and outside of its boundaries, including six other irrigation districts and individual Warren Act Contracts.

Solar facility at KID's office.

RENEWABLE RESOURCES

For many years, KID and project irrigators had a very favorable power rate contract with PacifiCorp and its predecessor. In return for dam construction, KID irrigators received power from the company governed by two 50-year contracts. The second contract ended in 2006. To date, rates have increased 50 percent per year to tariff, which is approximately 17 times original contract rates.

During the winter of 2011–2012, through a Reclamation Lease of Power Privilege, we partnered with a private firm and sited a hydroelectric power plant and fired it up in the spring of 2012. Our C-Drop Project includes an intake structure, fore bay, powerhouse, and a 150-foot transmission line. The plant is powered by a vertical Kaplan turbine using up to 700 cubic feet per second with 22.5 feet of drop. Maximum production capacity is 1.1 megawatts. Average annual production is anticipated to be 2,900 megawatt-hours. We are currently evaluating our operations to potentially increase production to 4,000 megawatt-hours. We sell the power into the grid and share revenues with our partner. Development of the power plant is something we are very proud of. Revenues on into the future will help offset assessments for irrigators.

In late 2011, we installed two solar arrays, one sitting right next to our office and another one near a supplemental pumping plant. We sell power from each 10-kilowatt production site into the grid. We set them up through the Oregon Solar Incentive Program (OSIP). Pacificorp pays an incentive payment of 42.3 cents per kilowatt-hour for the power produced. This amounts to approximately a 9 percent average annual return on investment over the course of 15-year contract.

Solar is moving beyond district efforts. A number of our water users have installed sites on their own operations. Some do net metering, and some do OSIP. There are tax incentives if you can take advantage of them—up to 30 to 50 percent of installation costs.

ADJUDICATION OF WATER RIGHTS

In March of this year, the Oregon Water Resources Department issued an administrative law judge's final order of determination of claims to surface water use in the Klamath River Basin. The final order conferred a state water right upon KID. Prior to having a state water right, we had always operated under a variety of contracts and a Reclamation claim to the waters of Upper Klamath Lake. We are going to have to determine how to operate under the state right and the obligations that come with it.

This has been a long-term effort. The process started back in the 1970s, and it has been slow and fairly contentious. Some individuals around the lake and along the tributaries feeding the lake had state rights, but project users never did. That had an impact on KID's water supply, as no state regulation could occur in favor of KID and project users as senior water users.

The final order determines the extent of water use in the basin. The Klamath Indian Tribe ended up with a significant water right to Upper Klamath Lake tributaries and to the lake itself. We made a stipulated agreement with the tribe before adjudication was completed, so the tribe will not make a call on our water use. The adjudication will provide more certainty for our water supply from year to year.

We have had some difficult water supply years since 1992, which have been exacerbated by Endangered Species Act requirements. There are endangered suckers living in the lake and in the Lost River, as well as salmon downstream on the Klamath. This year is a particularly tough watershed year—KID had to make a call on junior users. Unfortunately, a lot of farmers and ranchers with rights to the tributaries of the lake but outside of KID and the project were not able to irrigate this year.

The new state right has ramifications for our water users and district operations. KID is an old district with old infrastructure. As far as water deliveries go, we are

C-Drop Hydro ribbon cutting with Reclamation Commissioner Michael Conner and KID board member Ross Flemming.

not operating much differently than we were 50 years ago. Now, there are limitations on the amount of water and how it is used. First, we will have to undertake an educational program for our users to get them up to speed on the impact of those limitations. We will also have to address district operations to conform with the state right.

PLANNING AROUND LIMITED WATER SUPPLIES

KID's annual precipitation ranges from 11 to 13 inches. Upper Klamath Lake holds somewhere around 527,00 acre-feet at full capacity, and the project typically uses 350,000 to 400,000 acre-feet, irrigating approximately 160,000 acres of crop land, and provides water to two national wildlife refuges. The lake is dependent on a healthy snowpack. Because of this, it is hard for our users to plan. Often we will not know how much water is available for a growing season until April.

Given the challenges of a variable snowpack, seasonal inflows, and the water-use changes dictated by the new state water right, KID will have to change some of its operations. KID and the project have made a concerted effort to move away from crisis management and, through the Klamath Water and Power Agency, a water user organization, have developed a long-term plan to make demand meet supply. We will finish that planning process by the end of the year. The two major options are groundwater pumping and land idling. The next several years present a steep learning curve for the district and its water users.

As far as the project goes, there is not a lot of opportunity to conserve water through infrastructure improvements because we are so efficient with reuse. I think that conservation really has to happen at the grower level. And there will be opportunities for that.

CURRENT DIFFICULT ISSUES

The Klamath Project and KID are old facilities, and we are dealing with aging infrastructure issues. We are currently in the process of planning for replacement and making temporary interim repairs to a 0.8-mile-long raised concrete flume, which provides for approximately one-third of our irrigation deliveries. This process will be expensive. Initial estimates are approximately $12 million. Reclamation also has urban canal safety issues with the "A" Canal, which brings our entire supply of water from Klamath Lake. This canal flows through an urbanized area of Klamath Falls. So far, many of Reclamation's recommendations are very costly.

Mark Stuntebeck is the manager of the Klamath Irrigation District. He has worked for the district in a variety of capacities since 1985 and became manager in 2010. To contact Mark, call (541) 882-6661.

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Don Glaser

Donald R. Glaser brings the long view to his work with the Bureau of Reclamation. After five years in Sacramento as mid-Pacific regional director, he now serves as technical service center director in Denver. Don has spent more than 25 years with Reclamation in many positions throughout the West and in Washington, DC, including assistant commissioner for resources management and deputy commissioner. In addition to his work with Reclamation, he has worked as a water resource consultant, as the executive director for the Presidential Commission on Western Water Policy, and as the state director for the Bureau of Land Management in Colorado. Irrigation Leader's *senior writer, John Crotty, spoke with Don about his long career, the changes he has seen, and what the future may hold for the water and power community.*

John Crotty: You have enjoyed a long and diverse career with Reclamation. What are the most significant changes you have seen in the Reclamation program over your tenure?

Don Glaser: I started with Reclamation in 1975; 38 years later, both Reclamation and the entire water arena have changed substantially. Some of the biggest changes have been the result of enactment of various public laws that have changed the very nature and manner of our business. Several of the more significant laws include the National Environmental Policy Act, the Endangered Species Act [ESA], and the Clean Water Act. All three were brand new when I started with Reclamation.

The oil embargo of the late 1970s prompted legislation establishing the Department of Energy. That transferred a part of our power responsibilities—distribution and power marketing—to the newly established Western Area Power Administration, changing our relationship with our power customers and the manner in which we recover certain costs. I believe this also changed the relationship between the broader water and power communities in the West.

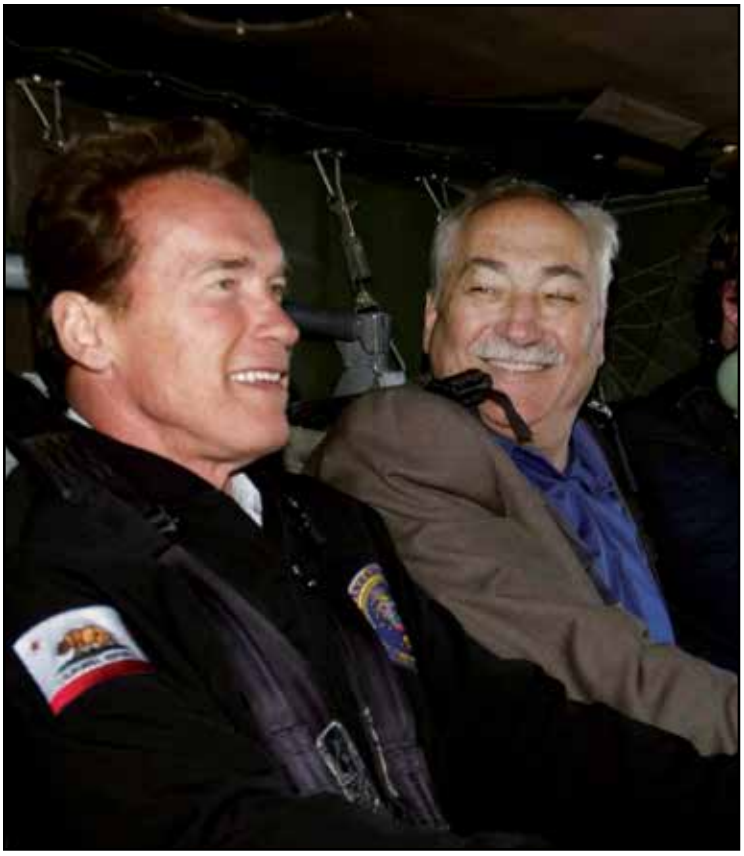
Another important change was the increased focus on the economic and environmental viability of Reclamation projects ushered in during the late 1970s. It resulted in an abrupt change in the implementation of several ongoing Reclamation projects. It also resulted in a general change in our approach to evaluating civil works projects and led, in part, to a more deliberate approach regarding the assessment of environmental impacts and economic viability of our projects.

In the early 1980s, there emerged a renewed focus on cost sharing and cost recovery. As a matter of law, we are required to recover capital and associated operation and maintenance costs for our projects through repayment by project beneficiaries. The move to more cost sharing of projects on the financing side and greater cost recovery on the repayment side has had a significant impact on the cost of services to our customers.

Technology has had a profound effect on Reclamation. When I started, computers were large mainframes located in one room and had the capacity of today's laptop. Communications were done through letters; they went through a rigorous review process and became a substantial part of the official record. Everything was much more deliberate, and great care was taken in preparing a document for signature.

Today, communications are instantaneous. Our record is very much influenced by what is in our individual computers. This makes it very difficult to keep up with what constitutes our official record. Also, through email, work can be delegated instantaneously throughout the organization, sometimes blurring lines of delegation. These changes have required new skills and a different workforce, as well as new processes.

As we moved to greater transparency and accountability in government, real-time information has become essential. This is leading to a more corporate approach with centralized systems and databases across Reclamation, as well as the department [of the Interior]. It continues to change our basic work processes.



Don and former California Governor Arnold Schwarzenegger prepare for a helicopter tour of the Central Valley Project in 2009.

in California, we were required to consult with both for species under their respective jurisdictions. It fundamentally changed how we operated our projects and delivered commodities to our water and power contractors.

Another change was how conflicted the public is over natural resources issues in general and Reclamation water issues in particular. It is often very difficult to get through a public planning process to a public decision without being challenged by one interest or another. In addition, various legal challenges have resulted in new responsibilities, such as river restoration programs, often with prescriptive requirements and timelines. They can be costly and compete for limited funding for Reclamation. The challenge right now is to figure out how we carry out our ever-increasing responsibilities within the current budget realities.

Conflicts in public opinion often reflect differing views regarding where the public interest lies and how Reclamation should carry out its responsibility given changing public needs and interests. A good example is Friant Division of the Central Valley Project. When we built Friant Dam in the 1950s, the intention was to dry up the San Joaquin River below Gravelly Ford, putting all flows in the San Joaquin River to consumptive beneficial use. It was going to be a dry river at most times with the only water in the river being flood flows.

John Crotty: You left Reclamation in 1995 and returned in 2008 as the regional director for the mid-Pacific region. What was the biggest difference you saw upon your return?

Don Glaser: It was a much more complicated water world than when I left. When I left, we were just starting to see the effect of ESA on project operations. For a long time, we believed that ESA did not apply to Reclamation's operating projects, only to projects in planning and construction, because Reclamation did not have discretion in project operation given Congress's directions and contractual obligations. Around the mid-1980s, this started to change, and our operating projects were determined to be subject to the requirements of ESA, resulting in consultation with [the U.S.] Fish and Wildlife [Service] and NOAA [National Oceanic and Atmospheric Administration] Fisheries. For the Central Valley Project

Intertie Pumping Plant dedication: (right to left) Reclamation Commissioner Connor; Dan Nelson, director of the San Luis and Delta Mendota Water Authority; Congressman Jim Costa; Mark Cowin, director of California Department of Water Resources; Don Glaser.

That was a definite public policy decision at the time.

There are those today who believe such an action was inherently wrong—rivers should have water in them and serve other public purposes through more natural flows and associated habitats. In the case of Friant, it took nearly 20 years to sort this out through courts and Congress, resulting in the San Joaquin River Restoration Program. Reengineering our previous solution is not an easy task. Over the 60 years since Friant Dam was constructed, the valley has adjusted to having a dry river and most water being put to consumptive beneficial use. Coldwater releases from Friant Dam resulted in a productive sport fishery immediately below the dam. Water users, and certain recreation interests, have come to rely on the conditions that were created. We have found that returning to a more natural condition has its own public impacts that must be addressed.

It really is a complex water world today with increasingly difficult tradeoffs, and it is becoming even more so as the West continues to urbanize. Also, there are many more organized and engaged interest groups involved in western water resources than there were only a decade ago.

John Crotty: Looking into the future, what are the most significant challenges Reclamation faces?

Don Glaser: I think the greatest challenges that Reclamation and its water and power customers face are the current fiscal challenges and having adequate funds to meet the many and varied obligations that we have as a matter of law. Solutions are becoming more elusive and expensive. Our facilities are getting older, and we are going to have to continue reinvesting in them in a more deliberate manner. All of these activities compete for finite funding. This will require us collectively to identify different financial approaches to address these needs.

Another challenge is the changing values and interests regarding the use of water resources in the West. Emerging water-related needs and interests are competing with Reclamation's ability to meet long-term legislative and contractual commitments and obligations. It is going to take a high level of skill on the part of the water and power user community in general and Reclamation employees in particular to address the needs of a public with such varied values related to the future of water in the West.

John Crotty: What advice do you have for Reclamation's water and power customers as they face these challenges?

Don Glaser: Success in the future is tied to the strength of our relationships across the broad spectrum of water interests. Building and maintaining relationships is more important now than it has ever been. Even if we cannot agree on certain policies as they relate to Reclamation responsibilities under federal law, continued dialog is so important. The more difficult the issue, the more we need to talk to each other.

Reclamation will continue to look for ways to share responsibility with the water and power community for operation and maintenance of certain federal facilities, particularly as money becomes tighter and Reclamation's ability to respond to certain issues diminishes. We need to continue to work with the water and power community to enable it to directly fund priority projects. This is becoming very common on the power side of the Reclamation program. However, this will require even greater accountability and transparency by Reclamation.

John Crotty: What are you most proud of over the span of your career with Reclamation?

Don Glaser: Proud may not be the right word. What I found the most satisfying was my last five years as the regional director of the mid-Pacific region. It was the only job that could have pulled me back into Reclamation. I came back to federal service because this is the time that many basic issues need to be resolved in the region. Mid-Pacific projects—the Central Valley Project, the Klamath Project, and the Newlands Project—are on the front line of challenges brought about by certain societal changes that challenge the traditional Reclamation program. The benefits provided and the challenges being faced require creative sustainable solutions now.

If I am proud of anything, it is the outstanding capability and commitment of Reclamation employees I have worked with, particularly the mid-Pacific region's management team and staff. Also, I am proud of the relationships we developed with our contractors and stakeholders. These are enduring investments that position Reclamation, the region, and our partners to address these important and challenging issues now and into the future.

Don Chandler, Chairman of the Board of Directors of the Farmers Irrigation District

Don Chandler is chairman of the board of directors of the Farmers Irrigation District (FID) in Hood River, Oregon, along the Columbia River Gorge. FID delivers water to 5,869 acres of agricultural, ranch, and municipal lands in the Hood River Valley. FID has been at the forefront of system efficiency, water conservation, and self-reliance over the past 25 years: pressurizing much of its system, generating revenue from its two hydropower generating stations, and even developing and patenting a National Oceanic and Atmospheric Administration–approved fish and debris screen for use across the West.

Rivers have figured prominently in Don's life. He served the United States in the Navy during the Vietnam War. A member of the Brownwater Navy, he hauled people and supplies up and down Vietnamese rivers, helping to ensure that our troops got the items they needed. In his professional career, Don managed domestic deliveries for Ice Fountain Water District, just south of Hood River, for about 30 years. As manager, he oversaw a major expansion of services to meet the needs of a customer base that grew from 800 to more than 2,000 over the course of his tenure.

Irrigation Leader *magazine's senior writer, John Crotty, spoke with Don about FID, moving from domestic water delivery to agricultural water delivery, and the next challenge ahead for FID.*

FID General Manager Jer Camarata (left) and Don Chandler (right).

John Crotty: How did you first become involved with FID?

Don Chandler: When I was manager at Ice Fountain, FID's former manager, Jerry Bryan, and I worked across the same water distribution areas. [Ice Fountain] water district laid pipeline in areas adjacent to open ditches, so Jerry and I talked about how we could put some of those ditches into pipe. It was through our collaboration with FID that I became interested in the irrigation side of water distribution. I've now been working on this side for the last 20 years.

Over the years, FID has been forward thinking and has completed many projects. In the last few years, we've gone from open-ditch water to nearly 100 percent pressurized water. We've spent a lot of money, have borrowed a lot of money, and right now, we're asking constituents for even more money so that we can continue on with these water conservation and efficiency projects. We've been able to make vast improvements in the efficiency of our system.

John Crotty: Describe your work as chairman of the board.

Don Chandler: The board sets policy for staff and for operations within the district. We have a budget committee that makes recommendations to the board about our annual budget. The board looks at rates once a year. We meet once a month. As chair, however, I am there more than that. I meet with Jer [Camarata, FID general manager] frequently to discuss issues that eventually he or I may need to bring to the board.

There are a variety of other issues the board addresses. We answer our constituents' questions about policies on billings, easements, infrastructure, and water rights. We correspond with landowners and discuss requests for proposals and power contracts.

FID is divided into five geographic divisions, each one represented by a board member. Members are elected by their peers in the division, so you have to go out, speak to your peers, and get their signatures to become eligible to be on the ballot for the board. Elections are held every three years.

Beyond election years, it is extremely important to communicate with your constituents—letting them know what work is being done, learning about what they would like to see done, and gauging what they think about the distribution system and the quality of water. While my district is in an urban–rural setting where you can go from a 6,000-square-foot plot to 100 acres of pear trees, most of my constituents run livestock and grow hay. My job is to listen to their concerns and update them on district operations and policies.

John Crotty: What makes for a successful relationship between a board and a district manager?

Don Chandler: The most important thing is communication—in speech and in writing. I'm not on the cutting edge of the technology, but I am learning. Jer Camarata is great at conveying important matters happening in the district in a variety of ways. He provides us with the information we need to make informed policies and decisions.

John Crotty: What is the biggest challenge facing the district?

Don Chandler: The biggest challenge right now is trying to fund the big infrastructure projects that we feel are important. There is only so much borrowing capacity for a district, and only so much that can be asked of our constituents. Finding revenue sources to build multimillion-dollar projects while delivering water at reasonable rates is a real fiscal challenge.

John Crotty: Where would you like to see FID in the future?

Don Chandler: While we have several projects on the drawing board, I would like to see FID successfully address its sedimentation issues. We have a real problem with sedimentation on the Hood River in the summertime. Glacial flour is suspended in water, and when you put pressure on it, it wears down equipment and grinds through steel and concrete quickly. Sedimentation is hard on pumps, sprinklers, filters, and pipe. It can clog pipes and headwork infrastructure, and it is extremely expensive to deal with.

Sedimentation has been a problem for as long as I can remember, and all three of the big irrigation districts here in the [Hood River] valley deal with this issue. We are located about 35 miles north of Mount Hood, and if we have an event that causes a chunk of glacier to collapse, or if we have a lot of rain, sedimentation or debris flows increase in the river very quickly. This is actually a year-round issue and can be devastating at times. Fortunately, beginning this fall we'll be working on an innovative sediment management facility to mitigate the problem. . . . That is, if we can get our design approved and funded.

Tools for Managing and Protecting Water Rights in Oregon

By David E. Filippi

Oregon, like other western states, subscribes to the prior appropriation doctrine. In recent years, however, Oregon has modified various common law principles to promote conservation and efficient use of water. These modifications provide irrigation districts and other water delivery organizations with greater flexibility in managing water rights than would have existed at common law. This article provides an introduction to four unique features of Oregon water law: (1) partial forfeiture protection, (2) changes to the authorized place of use without patron consent, (3) instream transfers and leasing, and (4) water spreading through conservation.

Partial Forfeiture Protection

At common law, "use it or lose it" was a fundamental principle. That is, a water right holder risked losing the right if the holder did not fully exercise the right each year. Under Oregon law, any portion of a water right certificate that is not exercised for a period of five consecutive years is presumed to have been forfeited. This presumption can be rebutted under certain circumstances.

In 1997, the Oregon legislature amended the state's forfeiture statute to allow the use of less water than the entire rate and duty authorized under a water right, provided that (1) the user actually uses *some* water for the authorized use identified in the water right at least once in a five-year period; (2) the user's facilities are otherwise capable of handling the entire rate and duty authorized by the water right; and (3) the user is otherwise ready, willing, and able to make full use of the entire rate and duty authorized under the water right. This protection removes the incentive that existed at common law for a water right holder to use the entire rate and duty authorized under the water right, regardless of whether such use was actually necessary.

Changes to the Authorized Place of Use Without Patron Consent

The cancellation of a water right within an irrigation district can adversely affect the district's ability to efficiently deliver water and maintain a broad assessment base. To protect irrigation districts from a situation in which a district patron allows a water right to be forfeited based on five consecutive years of nonuse, the Oregon legislature enacted a statute in 1991 that allows a district to change the place of use of a water right (i.e., "transfer" the right) to other lands within the district. The owner of the property to which the water right is appurtenant need not consent.

To avoid forfeiture, a district must petition for a transfer no later than the end of the calendar year of the fifth consecutive year of nonuse. The standard five-year forfeiture provision, then, does not apply to the portion of the water right at issue pending approval of the petition.

Instream Transfers and Leasing

The Oregon legislature created a new type of water right—an instream water right—in 1987. Instream water rights are held in trust by the Oregon Water Resources Department (OWRD). These water rights differ from other water rights because neither diversion of the water from the source nor physical control over the water is required for instream water rights.

Existing water right holders may apply to transfer or lease water instream. A transfer can be either time limited (i.e., the water right reverts back to the original use after a specified period) or permanent. A lease can be for a period of five years or less, but the lease can be renewed an unlimited number of times. Instream transfers and leases carry the priority date of the original water right, and water subject to an instream transfer or lease may not be diverted by a junior user. OWRD is authorized to approve a transfer or lease application only if OWRD determines that the transfer or lease will not result in injury to other water rights or enlarge the existing water right. OWRD must modify or terminate the transfer or lease if, after approval, OWRD determines that injury or enlargement has occurred.

For irrigation districts, one benefit of this program is that it allows the district to avoid forfeiting a water right by putting it to "use" instream. In this way, the program removes the incentive that existed at common law to put a water right to consumptive use, regardless of whether such use was actually necessary. For this reason, and because conservation organizations will often compensate water users for leasing water instream, the instream lease program has grown significantly since OWRD issued the first instream leases in 1994. In 2011, a total of 443.8 cubic feet per second was leased instream statewide.

Water Spreading Through Conservation

Water spreading (i.e., expanding the use of water to additional acres through conservation) was prohibited at common law. Oregon's allocation of conserved water statute allows a water right holder who conserves water to use a portion of the conserved water on additional lands, lease or sell the conserved water, or dedicate the conserved water to instream use. The remaining portion of the conserved water is allocated to the state.

The portion of the conserved water allocated to the water right holder is 75 percent, unless more than 25 percent of the funds used to finance the conservation project comes from public sources. Where more than 25 percent of the funds comes from public sources and is not subject to repayment, the state's percentage of the conserved water is equal to the percentage of public funds used. The remaining portion of the conserved water is allocated to the water right holder.

The state's portion is used as follows:

1. If the conserved water is necessary to support instream flow purposes, OWRD issues an instream water right certificate for its portion.
2. If the conserved water is not necessary to support instream flow purposes, the conserved water reverts to the public for appropriation.

The priority of any right to use conserved water is either the same as, or one minute junior to, the priority of the water right under which the conservation measure was implemented. The water right holder elects which priority to use; however, the priority must be the same for the portion allocated to the water right holder and the portion allocated to the state.

In sum, while the prior appropriation doctrine remains the foundation of Oregon's water laws, recent statutory changes designed to promote conservation and efficiency have provided Oregon irrigation districts with options for managing the water rights they are charged with protecting.

David E. Filippi is a member of Stoel Rives LLP, practicing in the areas of natural resources, environmental, and land use law. He concentrates his practice on water rights and water quality, fish and wildlife law, and project facility siting and permitting. Mr. Filippi has served continuously on the board of the Oregon Water Resources Congress, the trade association representing irrigation districts in Oregon, since 1999. David can be reached at (503) 294-9529 or defilippi@stoel.com.

Corps Policy:

Natural Flows and the State Primacy of Water

By Tony Willardson

The U.S. Army Corps of Engineers is currently pursuing rulemaking intended to clarify definitions in its water supply policies and to specify the policies and methodology it will use to determine prices for surplus water contracts pursuant to section 6 of the Flood Control Act of 1944 (FCA). The Corps is also conducting a system-wide analysis of storage water reallocation in the Missouri River Mainstem Reservoir System. The Corps' efforts should recognize state authority over surface water allocation and properly interpret *stored water* and *storage capacity*.

State Primacy

Water belongs to the states, which have exclusive authority over the allocation and administration of rights to the use of surface water within their borders. State-granted water-use permits, once put to beneficial use, also become property rights with constitutional protections, including due process and compensation if taken through government action.

The basis of the states' primary and exclusive authority over their water resources is rooted in the Equal Footing Doctrine in Article IV of the U.S. Constitution, under which states take title to the navigable waters within their borders upon admission to the Union. As the U.S. Supreme Court has noted in *California v. U.S.,* 438 U.S. 645, 653-664 (1978), Congress has also demonstrated a "consistent thread of purposeful and continued deference to state water law" through such laws and provisions as the Mining Acts of 1866 and 1870, the Desert Lands Act of 1877, the Federal Water Power Act of 1920, section 8 of the Reclamation Act of 1902, and others.

Congress was well aware of this deference when it enacted the laws that govern the use of surplus water and storage at Corps' reservoirs, namely the FCA and the Water Supply Act of 1958 (WSA). For example, it specified in the first sentence of the FCA in section 1 that it is "the policy of the Congress to recognize the interests and rights of the States in determining the development of the watersheds within their borders and likewise their interests and rights in water utilization and control. . . ." 33 U.S.C. § 701-1.

Similarly, Congress specified in section 301(a) of the WSA that it is the policy of Congress to:

> [R]ecognize the primary responsibilities of the States and local interests in developing water supplies . . . and that the Federal Government should participate and cooperate with States and local interests in developing such water supplies in connection with the construction, maintenance, and operation of Federal navigation, flood control, irrigation, or multiple purpose projects. 43 U.S.C. § 390b.

Section 301(c) of the WSA further specifies that the law's water supply section "shall not be construed to modify the provisions" of section 1 of the FCA or the provisions of section 8 of the Reclamation Act of 1902. *Id.*

Distinguishing Storage Capacity from Stored Water

There is a difference between a reservoir's storage capacity and stored water. Stored water does not encompass all of the water in a reservoir. To the contrary, it represents the difference between water flowing into a reservoir and the water flowing out of the reservoir. Stated another way, if more water flows into the reservoir than leaves the reservoir, this water is captured as stored water. If less water flows into the reservoir than leaves the reservoir, this water supply represents the release of stored water. In either event, the natural flows that would exist absent the Corps' dams and reservoirs should not be considered stored water.

Section 6 of the FCA states that the Corps "is authorized to make contracts . . . at such prices and on such terms as [it] may deem reasonable, for domestic and industrial uses for surplus water that may be available at any reservoir" under the Corps' control. 33 U.S.C. § 708. The Corps has interpreted *surplus water* to mean, in part, any water in a Corps reservoir that is not required for federally authorized purposes "because the authorized use for the water never developed or the need was reduced by changes that occurred since authorization or construction." Engineer Regulation 1105-2-100, Planning Guidance Notebook at E-214 (Apr. 22, 2000). Corps officials in the Missouri River Basin have further indicated that once water reaches a reservoir, all water within the boundaries of that reservoir is subject to the Corps' authority and can be evaluated to determine whether it is surplus under the above definition, including the natural flows belonging to the states.

This interpretation ignores the distinction between storage capacity and stored water by improperly viewing the Missouri River as a series of reservoirs connected by free-flowing rivers. The more correct view is that there are reservoirs sitting on top of portions of the river. The Corps can evaluate the reservoir pool to determine

whether there is water surplus for authorized needs and uses, but the natural flowing-river volumes that run beneath the reservoir system should not be considered stored water and may be permitted by the respective states without Corps interference or contract and fee requirements.

Reasoning otherwise would be contrary to the protection of state "interests and rights in water utilization and control" provided under section 1 of the FCA, as well as requirements under section 6 that storage contracts for surplus water must not "adversely affect then existing lawful uses of such water." 33 U.S.C. §§ 701-1, 708. The states' use of natural flows was an existing lawful use prior to the act's enactment and is therefore protected.

Section 301(b) of the WSA authorizes the Corps to include storage at any planned or existing Corps reservoir for municipal and industrial water supply, provided that "State or local interests shall agree to pay for the cost of such provisions. . . ." 43 U.S.C. § 390b. While the Corps has authority under the WSA to require a contractual commitment to repay a portion of the cost of providing storage, the amount of water stored in a reservoir does not include all of the water flowing through its boundaries. Requiring a fee to access natural flows that would otherwise be available absent the Corps' facilities conflicts with the recognition of state primacy over water utilization and control found in sections 301(a) and 301(c) of the WSA. Such a requirement also runs counter to section 301(b)'s stated purpose of recouping expenses the Corps incurs in providing storage.

Conclusion

In sum, the Corps' surplus water rulemaking and storage water reallocation study should (1) be developed with robust and meaningful state participation, (2) recognize and defer to the states' primary and exclusive authority over the allocation of surface water, (3) properly distinguish between stored water and storage capacity, and (4) ensure that natural flows are not considered to be surplus or stored water.

Tony Willardson is executive director of the Western States Water Council (WSWC), representing the governors of 18 western states on water policy issues. You can reach Tony at (801) 685-2555 or twillardson@wswc.utah.gov.

This article was adapted from an August 13 letter from WSWC to Jo-Ellen Darcy, assistant secretary of the Army (Civil Works).

The James Leffel & Co.: 150 Years of American Hydraulic Ingenuity

The James Leffel & Co. of Springfield, Ohio, has been designing and manufacturing hydraulic turbines in the United States since 1862. Leffel provides a comprehensive slate of services, including the manufacture of new turbines, refurbishment, parts replacement, site inspections, and product installation. Over the last 10 years, Leffel has been able to tap into America's renewed interest in hydropower.

The company is geared toward all scales of hydropower generation, but generally works on projects between 0.5 and 8 megawatts. Its client base consists of municipalities, utilities, the Army Corps of Engineers, and private owners in the United States and abroad. During the 20-year period prior to 2004, much of its work involved turbine refurbishments; now, the bulk of its work is split between new installations and rehabilitation projects.

History

James Leffel established the company in Springfield in 1862. The company's founding father, Leffel was an entrepreneur with a seemingly innate understanding of hydraulics. He grew up around his father's gristmill and worked for 15 years as a millwright. Leffel eventually ran a foundry that served as a testing ground for his water wheel experiments. His efforts led to the development of his most famous creation, the double turbine, which maximized power generation through two sets of internal buckets that facilitated flows inward and down through the turbine. It sold well and helped establish the company's sterling reputation. Leffel was not able to fully enjoy his success, however, as he died in 1866.

The company operated as James Leffel & Co. until 1980. It then changed hands twice, eventually coming under the ownership of Kvaerner Hydro of Olso, Norway. Business slowed in the late 1980s, and by 1989, Kvaerner decided to close the Springfield office. In response, Anders Dynge, lead engineer at Kvaerner for many years, bought the James Leffel portion of the business from Kvaerner. Dynge did not look back as he led his team of 10 into a new era of waterpower.

Juniper Ridge spiral case set.

Replacement shaft (14 inches in diameter and 26 feet long) for a Leffel horizontal unit in Indonesia.

From Design to Installation

Generally, customers approach the company with preliminary information about a project. Of particular importance are two data points: head and how much water is available to run through the turbine. Leffel engineers then either work from set designs or design from scratch, depending on site conditions. Anders then looks at the information and the design to determine whether Leffel can be of help.

By the time an official request for bid has been made, Leffel will have already ironed out the details and finalized the design. Upon winning the bid, the company manufactures from that design. Leffel manufactures most of its components, such as the runner and the covers, with stainless steel. The crew tests for form, fit, and function at its shop in Springfield. Who does the installation depends on the project, the contract, and the personnel.

Manufacturing hydraulic turbines is a team effort. There are quite a few people and entities involved: foundries, pattern makers, steel suppliers, machine shops, tool and die shops, fabricators, painters, blasters, and trucking outfits. Most of Leffel's subcontractors are within 25 miles of its facilities.

Representative Hydro Projects in the West

Juniper Ridge Hydro Project, Central Oregon. Leffel designed and manufactured a 5-megawatt Francis turbine for Central Oregon Irrigation District's Juniper Ridge hydro project to capture the energy of 700 feet of elevation fall on the Deschutes River between Bend and Redmond. Among the many project components was the powerhouse, which enclosed a concrete-encased draft tube, the Francis turbine, a generator, a hydraulic operating system, and electrical components. Leffel had its man on the ground for a couple of weeks—Project Manager Jim Ward was onsite from the generator installation process until after unit testing.

According to Central Oregon Irrigation District's General Manager Steve Johnson, the project is currently generating 3.4 percent better than projected, and far above minimum, generation requirements. Johnson was impressed with Leffel's work, stating, "We couldn't have asked for better support and dedication to the project. They took a lot of pride and ownership of the unit."

Johnson also stressed that a key component of project was the use of American parts and manufacturing. Rooted in the countryside of central Ohio, the Leffel team and its subcontractors embodied that aspect of the project.

Contra Costa Energy Recovery Project, Sacremento River Delta. Contra Costa Water District's (CCWD's) energy recovery project harnesses power from the flow of water through the Los Vaqueros pipeline to produce a maximum of 1 megawatt of energy. Leffel designed and manufactured a Francis turbine for the $6.3 million hydroelectric generation facility. Jim Ward explained the energy recovery concept. "Where there is a significant drop over the length of a pipeline, pressure builds; you can either kill it by running it through a valve that will take energy out of the water, or you can put a hydro turbine in the line to convert the water's energy into power in the shaft." CCWD's facility does just that, resulting in sizable cost savings by offsetting some of the district's pump station load.

Time-Tested Principles

Much like James Leffel himself, company owner Anders Dynge has been crafting hydropower solutions for more than 40 years. And like its earliest iteration, The James Leffel & Co. of today is providing durable and efficient equipment for the small hydro market in the United States.

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***IRRIGATION LEADER* magazine** is sponsoring the 2nd Annual Operations and Management Workshop with a theme of "Self-Reliance and Efficiency." The purpose of the workshop is to provide an opportunity for General Managers and Directors of irrigation districts to discuss and exchange information on a variety of District operational and management-related issues, build out-of-state working relationships, and learn from their peers. The issues and topics will be selected by General managers and Board Directors and will pertain directly to the management and improvement of irrigation districts. Discussions will feature case studies with General Managers sharing their experiences alongside product or service vendors who were directly involved.

TENTATIVE SCHEDULE

WEDNESDAY, February 12

8:00 am	Litigation Prevention -The Texas Solution -New Reclamation Contracting Provisions
10:15 am	Break
10:30 am	Negotiation Skills For Contracting, Labor, Insurance
12:00 pm	Lunch provided
1:00 pm	Media Training -Developing a Plan
3:00 pm	Break
3:15 pm	Open Forum -Gathering and sharing GIS data with Reclamation
5:00 pm	Hosted reception

THURSDAY, February 13

8:00 am	Office Management Efficiencies
9:00 am	New Fixes for Old Infrastructure -Canal and Pipe Repairs
10:15 am	Break
10:30 am	Urbanization, What to Avoid, How to Make It Work For Your District
12:00 pm	Lunch Provided
1:00 pm	Reducing Costs on Canal Weed Control
2:00 pm	What Every Board Member Should Know
3:00 pm	Break
3:15 pm	Developing Low-Head Hydro For Revenue
5:00 pm	Hosted Reception

Your suggestion for additional panel and Open Forum topics: _____

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HOTEL RESERVATIONS: We have reserved a block of rooms at the **Phoenix airport Plaza Hotel (soon to be renamed the Crowne Plaza Phoenix Airport Hotel)** located at 4300 East Washington Street, Phoenix, Arizona 85034, at the rate of $133 per night plus tax of 12.27%. This includes **full buffet breakfast**, complimentary airport shuttle service, complimentary Internet service, and free parking. To make your reservations, please call 602-286-1117 or 1-855-586-8475 no later than Friday, January 10. **Please tell the agent that you are attending the Irrigation Leader Workshop to obtain this special rate.**

CLASSIFIED LISTINGS

BELLE FOURCHE IRRIGATION DISTRICT

Project Manager

Belle Fourche Irrigation District near the beautiful Black Hills of South Dakota is accepting applications for a Project Manager.

The Project Manager (PM) administers and implements the policies and programs adopted by the Board of Directors. The PM manages the activities of all Project employees, evaluates operational procedures, and coordinates all planning and development programs, including preparing grant applications. The PM develops specific program goals, policies, procedures and objectives. The PM keeps the Board apprised of the operations and needs of the Project, presents an annual budget to the Board, and prepares other reports as requested by the Board. The PM directs the distribution of the Project irrigation water supply to Project patrons.

PM must have excellent communication and interpersonal skills and be capable of sustaining productive working relationships with the Board of Directors, employees, water users and all other entities of the District.

College degree not required but would be desirable. Management experience not necessary but would be looked at favorable. General agricultural knowledge is required. Benefits include medical, paid holidays, South Dakota Retirement, sick leave and vacation.

Please send resume to: Belle Fourche Irrigation District; Attn: Darron, Board Chairman, P.O. Box 225, Newell, SD 57760.

For information on posting to the Classified Listings, please e-mail Irrigation.Leader@ waterstrategies.com

Irrigation Leader

2013 CALENDAR

October 2–4	Western States Water Council, Fall Council Meeting, Deadwood, SD
October 15	Montana Water Resources Assn., Fall Meeting, Bozeman, MT
October 22–23	TruePoint Solutions, User Group Meeting, Reno, NV
October 22–24	Wyoming & Upper Missouri Water Assns., Joint Annual Meeting and Educational Seminar, Sheridan, WY
October 23–25	Texas Water Conservation Assn., Fall Conference, San Antonio, TX
November 4–8	Irrigation Assn., Irrigation Show and Education Conference, Austin, TX
November 5–7	Nevada Water Resources Assn. River Symposium and Tour, Reno, NV
November 7	Columbia Basin Development League, Annual Conference, Moses Lake, WA
November 13–15	National Water Resources Assn., Annual Convention, San Antonio, TX
November 13–15	ESRI, Southwest User Conference, Salt Lake City, UT
November 21–22	Idaho Water Users Assn., Annual Water Law Seminar, Boise, ID
December 3–6	Assn. of California Water Agencies, Fall Conference & Exhibition, Los Angeles, CA
December 3–6	Oregon Water Resources Congress, Annual Conference, Hood River, OR
January 7–8	National Water Resources Assn., Leadership Forum, Las Vegas, NV
January 29–31	Colorado Water Congress, Annual Convention, Denver, CO
February 12–13	***Irrigation Leader* Magazine, Operations and Management Workshop, Phoenix, AZ**
February 19–21	Family Farm Alliance, Annual Meeting & Conference, Las Vegas, NV
February 20–21	Multi–State Salinity Coalition, Annual Salinity Summit, Las Vegas, NV
February 25–27	Assn. of California Water Agencies, Washington Conference, Washington, DC

For more information on advertising in *Irrigation Leader* magazine, or if you would like a water event listed here, please phone (703) 517-3962 or e-mail Irrigation.Leader@waterstrategies.com. Submissions are due the first of each month preceding the next issue.

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