

Irrigation Leader

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Natural
Resources
District
**Middle
Republican**



**Jack Russell and Sylvia Johnson:
Advancing Groundwater Management
at the Middle Republican
Natural Resources District**

Piping the Central Oregon Irrigation District's Pilot Butte Canal



Groundbreaking on the Pilot Butte Canal piping project.

Established in 1918, Central Oregon Irrigation District (COID) is a municipal corporation of the State of Oregon. The district's mission is to provide a reliable supply of water to 3,500 patrons throughout Bend, Redmond, Powell Butte, and Alfalfa. COID operates and maintains over 400 miles of canals that collectively deliver water to approximately 46,222 acres of productive land.

The irrigation system consists of two main canals: the Pilot Butte Canal, which runs north through Bend, Redmond, and Terrebonne; and the Central Oregon Canal, which runs east through Bend, Alfalfa, and Powell Butte. Both canals divert water from the Deschutes River. The Deschutes River is the largest spring-fed river in the United States.

The district provides water for about 48,000 acres within an 180,000-acre area in Central Oregon. More than 400 miles of canals provide agricultural and industrial water to the Bend, Redmond, Terrebonne, Alfalfa, and Powell Butte areas. In addition, COID provides water to subdivisions in the areas the canals pass through, for landscapes and lawns, parks, cemeteries, and golf courses.

COID has worked for over a century to improve irrigation water delivery, both on farm and within its canal systems. Since

2000, the district has increased stream flows in the Deschutes basin by nearly 80 cubic feet per second (cfs), through conserved water projects and permanent instream transfers.

The district has taken unprecedented steps to conserve water, improve fish and wildlife habitat, and responsibly manage its natural resources. One of its most recent conservation projects is the first phase of the piping of its 23-mile-long Pilot Butte Canal. In this interview, COID Managing Director Craig Horrell; COID Deputy Managing Director Shon Rae; and Kevin Isley of construction firm Taylor Northwest, who is the project manager for the piping project, speak with Irrigation Leader about the piping project and COID's other top current issues.

Irrigation Leader: Please tell us about your backgrounds and how you came to be in your current positions.

Shon Rae: My background is mostly in the home building industry and in nonprofit management. I grew up on a small farm here in central Oregon. I have some experience in irrigation from the farm side. I've been with the district for 6 years.

Craig Horrell: I owned a civil engineering firm for about 17 years and did lots of work for irrigation districts. Seven years ago, this position became available, and I have been the managing director since then.

Kevin Isley: I'm an Oregon native. My background is in water and wastewater. My dad was a biologist with the Oregon Department of Fish and Wildlife, so I've been around water all my life. I grew up in northeastern Oregon and have an agricultural background. I have been in construction project management for 16 years and have been with Taylor Northwest for 5 years.

Irrigation Leader: Please tell us about COID.

Shon Rae: The district was started and made its first delivery in 1904 and has gone through several names, including Pilot Butte Irrigation and Light. The district was taken over by its membership 101 years ago. Today, we service 48,000 acres of irrigated land and have about 3,600 patrons. Over the years, our area has urbanized, and many of our big parcels are getting subdivided into small plots of 5 or fewer acres. That means that we have more patrons than many other local irrigation districts. We are constantly seeking opportunities to conserve water through programs like piping to maximize our supply and reduce irrigation demands. To provide a reliable supply of water to our patrons, we must find ways to provide it in an environmentally and economically sustainable manner.

Irrigation Leader: To what degree are you still primarily an agricultural water provider?

Craig Horrell: About one-third of our acreage consists of lifestyle farms—people raising kids to do 4-H and raise cattle for themselves. Another third consists of small acreages.

Irrigation Leader: Please tell us about COID's women in leadership positions.

Shon Rae: Craig is probably to thank for that. We've hired several women managers and promoted women internally to management positions. Half our management team are women, which is not common in our industry. It's generally an industry dominated by older men. It's exciting for us to be at the forefront of promoting women in water. There's no reason that women can't be in leadership positions in this industry.

Craig Horrell: The women we've hired and put in these positions all have a deep-rooted desire to help agriculture because they've either been raised in agriculture or live on it now.

Shon Rae: We also recently hired a woman with an environmental background. She's our land-use and development person. She brings a nice balance to our perspective.

Irrigation Leader: What are the implications of urbanization for property, water rights, and communication with your customers?

Shon Rae: It is a considerable challenge. We have around 200–300 property turnovers a year, including both large and small properties. Many new owners are from cities and do not understand water rights. Owners often think that COID will come out and turn on their water for them. There is a huge need to educate these people, and although we try to educate them to some degree, we don't have the capacity to educate them to the degree necessary. They need to be shown how to change water and how to use their land beneficially. It's a constant challenge. In town, bigger parcels are being developed into small residential parcels, which leaves us with water that we can use for other purposes.

Craig Horrell: We're looking at creative ways of moving that water to better uses, such as by marketing it to farmers who want to expand the water rights on their farms. We have looked at water banking as well.

Another issue created by urbanization is that people who have never dealt with irrigated ag move into our district and see the canal as a water feature. Piping sections of the canal has been a topic of debate with homeowners with property along stretches of the canal. Seven years ago, we began an educational program to help people understand that water is a utility that must be delivered to farmers efficiently.

Shon Rae: Our system runs through the city of Bend, the second-fastest-growing city in the nation. With growth come changes and challenges. We've created and implemented a strategy to establish a community-wide awareness and understanding of COID's mission to provide a reliable supply of water in an environmentally and economically sustainable manner. The district has given presentations to chambers of commerce and civic groups to talk about trending water topics in the community. We also seek opportunities to partner with organizations that align with our mission and goals. We have made a lot of progress, but the growth of the city makes it a continual process.

Irrigation Leader: What was the motivation behind piping the Pilot Butte Canal?

Craig Horrell: COID is taking a long-range view of our irrigation system to ensure reliable access to water for the next 100 years. COID's capital plan revolves around piping the entire length of the Pilot Butte Canal. We lose approximately 50 percent of our water to evaporation and seepage from canals and laterals during the irrigation season. By piping the Pilot Butte Canal, we can conserve a significant portion of this water and use it to benefit fish and wildlife in the Deschutes River ecosystem, support



COID's raw pipe as it comes off the Northwest Pipe mill. The 102-inch spiralweld steel pipe is lined and coated with polyurethane before being transported to the worksite.

sustainable agriculture, save our patrons money, and help central Oregon better manage its water resources for the future. The amount of water COID saves through on-farm improvements, piping, and other conservation measures can be shared with North Unit Irrigation District (NUID) and other junior water right holders to ensure that farmers have the water they need, even in dry years. NUID will then be able to make water available from its storage in Wickiup Reservoir to increase winter flows in the Deschutes River.

Irrigation Leader: How much pipe is involved?

Craig Horrell: The first phase involves 7.9 miles of large-diameter pipe, ranging from 24 to 109 inches in diameter. It will be able to be pressurized to 100 pounds per square inch. The entire Pilot Butte Canal is 23 miles long and will be piped in roughly 10 phases.

Irrigation Leader: Tell us about the planning and construction process. At what point did you select Taylor Northwest as the contractor, and why?

Craig Horrell: After we started a modernization plan, we decided to focus on the main canals and main laterals. We

hired KPFF Engineering of Portland to do a 30 percent design of the main canal. We thought this was an excellent opportunity for a design-bid process. We asked for proposals from a team that could help us build components, and we brought Taylor Northwest in during the 30 percent design, which helped us immensely in figuring out the components of the design. We asked for proposals for a design-build, and Taylor Northwest was the successful bidder.

Irrigation Leader: Mr. Isley, how does this project compare to the projects that Taylor Northwest typically works on?

Kevin Isley: We do a decent number of large, underground civil projects and pipe work. We've also recently started doing more design-build and construction-manager-general-contractor-type project deliveries. This one was a good fit in that regard. We find those projects to be highly successful, mostly because constructability review goes on throughout the design process, rather than being done after the plans are already complete.

Craig Horrell: The cost of the large-diameter pipe made up 50 percent of the cost of this project. Taylor Northwest helped us determine what product would be the best and most affordable, which was no easy task. We ended up choosing steel pipe manufactured by Northwest Pipe.

Irrigation Leader: Would you tell us more about the factors that went into the selection of that pipe?

Craig Horrell: The important factors included price, durability, and constructability. There were challenges to constructability with some of the preferred pipe materials, especially when it came to large-diameter pipe. Steel pipe matched up to other materials from a performance and quality standpoint, and the cost was competitive. Another benefit is the strength of steel and its natural resistance to seismic events. It took us about 3 months from start to finish to properly vet and select pipe materials and a vendor.

Craig Horrell: We visited several pipe plants. Northwest Pipe won out for a lot of reasons. It has a Portland, Oregon-based manufacturing center, which for us is basically as local as you can get. It's made in Oregon and will stay in Oregon. That was a huge factor because delivering 14-foot pipe is pretty expensive.

Irrigation Leader: When was ground broken on this project, and what is the projected timeline for completion?

Craig Horrell: We shut the water off on October 1, 2020, about 7–10 days earlier than normal, to get a jump start on construction in case we encountered bad weather. Taylor Northwest broke ground the first week of October. We will complete the year 1 work of phase 1 before we turn water back on in mid-April 2021.



Work on phase 1 of the Pilot Butte Canal piping project.


Kevin Isley: We've had good weather, which has been a big help. The district has also been proactive about communicating about the project to its patrons. The patrons we have visited in the field have been accommodating and appreciative of the work. People enjoy the aesthetic quality of the canals, but they have been educated properly over the last few years of planning and understand the overall importance of these improvements for the districts and the local environment. We are on schedule, and everything is going well. We have a great design and project team, and everyone is working together to move the project forward through design and construction.

Irrigation Leader: How is COID funding this project?

Craig Horrell: This project is 75 percent funded through the Watershed Protection and Flood Prevention Act, PL-566, and 25 percent funded through COID. The district is paying for its 25 percent with a \$2 million state revolving loan from the Oregon Department of Environmental Quality and an \$8 million lottery bond from the State of Oregon. Our lottery bonds were temporarily put on hold because of the COVID-19 pandemic, though it looks like the governor will reinstate them. The remaining \$24.9 million is coming from the Natural Resources Conservation Service under PL-566.

Shon Rae: The amount of economic activity COID can generate in the Oregon economy as a result of

modernization-related expenditures is enormous. As the spending moves through the economy, its ripple effects go far beyond the initial direct expenditures. The benefits are staggering and serve as motivation to manage water more sustainably. Piping the entire Pilot Butte Canal is expected to create over 150 jobs in the construction sector and other sectors and to generate more than \$145 million in income. Infrastructure projects are much needed in our world right now to keep people working and our economy healthy.

Craig Horrell: We are fortunate as Oregonians that our contractor is local to central Oregon and that our pipe provider is local to Oregon. This project will support at least 150 jobs for the next 2 years. 



Craig Horrell is the managing director of the Central Oregon Irrigation District. Kevin Isley is a project manager at Taylor Northwest. Shon Rae is the deputy managing director of the Central Oregon Irrigation District. For more about Central Oregon Irrigation District, visit www.coid.org. You can follow COID on Facebook @centraloregonirrigation.