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Critical OID tunnel project nears completion; eliminates risk of bottleneck in water deliveries

OAKDALE – A problematic section of a 100-year-old canal that poses a major threat to many Oakdale Irrigation District customers soon will carry its final drops of water.

The area in question is along the steep Stanislaus River canyon a few miles east of Knights Ferry. It is part of the South Main Canal, which delivers water to about 60% of OID's irrigators. The problem is that a potential of a rock slide along a 1-mile section of the canal could choke off water during a critical portion of the year. The hazard is compounded by "creep failure" – meaning the canal is slowly moving downhill toward the river.

To eliminate both threats, OID is nearing completion of a 5,949-foot tunnel that is 14 feet tall and 17 feet wide. In the early morning hours of Sept. 18, miners precisely linked sections of the tunnel that had been bored from opposite directions beginning a year earlier.

"The potential loss of the South Main Canal in this section has been a critical concern for a long time," said General Manager Steve Knell. "It's taken years of hard work by staff and management and funding by the Board of Directors to make this repair possible. Its completion is a significant accomplishment for OID and for water supply reliability on the south side of our service area."

The project began more than a decade ago, in 2007, when Condor Earth of Sonora began the initial tunnel design and geological data reports. At that time, there already was concern that the earth was shifting above the canal, which was built in 1912, three years after OID was formed.

Through the decades, there have been numerous rock slides into the canal, though irrigators rarely experienced any delays during the March through October delivery season. The exception was one major rock slide in the 1980s. Grouted rock bolts were installed through portions of the threatened section of the canal, but they were a Band-Aid and not a permanent solution.

A new tunnel was the answer. When it is put into service, the new Two-Mile Bar Tunnel will be OID's 10th on the South Main Canal.

Environmental permits were secured in 2016. They primarily focused on potential impacts to the California tiger salamander as well as vernal pool crustacean habitat.

The project was put out to bid in 2016 and Drill Tech Drilling & Shoring of Antioch was selected. The estimated cost of the tunnel is \$15 million, which OID will pay for in cash with reserves built up by years of strategic transfers and sales of surplus water to West Side irrigation districts.

“All the infrastructure improvements at OID have been and continue to be paid for from the sale of surplus water,” Knell said. “To date, 98% of all water sale revenues have been spent on projects to rebuild and modernize our irrigation district – at no cost to our rate payers. That’s remarkable and a testament to the vision of the OID Board in the late 1990s to develop such a program. It has served the district well.”

Mining began Sept. 20, 2017, on the east (or upstream side) of the tunnel. In November 2017 – once the last water of the season had been drained from the South Main canal – tunnel excavating also began from the west (or downstream side).

Between November 2017 and the end of February of this year, Drill Tech crews – often working double-shifts – tunneled 552 feet to the east from the downstream side. They ceased from further mining from that direction in late February, before water once again filled the South Main Canal.

Meanwhile, work continued from the upstream portion of the tunnel. Day by day, workers bored more than a mile to the west through material known as the Mehrten Formation, a typical rock found in the Table Mountain area.

Workers used huge grinders to slowly claw into the mountain. A conveyer belt fed the mined material into low-profile dump trucks to move it out of the tunnel. Periodically, the sides and ceiling of the tunnel were sprayed with a layer of concrete. When necessary, rock bolts were installed to ensure adequate ground support.

More than 73,000 cubic yards of material — which primarily consisted of volcanic rock millions of years old -- was removed and hauled to a site a few miles to the west near Lovers’ Leap.

At 1:47 a.m. on Sept. 21, “hole through” occurred – meaning the mining from opposite directions finally met. The survey alignment was spot on – the tunnel perfectly matched up in height, width and depth.

Between now and next March – when the first water will begin flowing through the new tunnel – workers will be completing final elements of the project. That includes sealing off access to a portion of the South Main Canal bypassed by the tunnel.

ABOUT THE PARTICIPANTS: The [Oakdale Irrigation District](#) is the owner of the project. It delivers water from the Stanislaus River watershed to about 2,900 agricultural customers representing about 80,000 acres in Stanislaus and San Joaquin counties.

[Condor Earth](#) of Sonora is the project engineer and construction manager.

[Drill Tech Drilling & Shoring](#) of Antioch is the tunnel excavation contractor.

[Bumgardner Biological Consulting](#) of Gold River is the onsite biologist.