

Water flows uphill? Maybe, in California drought

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By GARANCE BURKE

File - In this Oct. 8, 2009 file photo, sunlight is seen reflecting on water flowing south in the California Aqueduct near Patterson, Calif. The California Aqueduct has been ferrying water from the state's verdant north to the south's arid croplands and cities since Gov. Jerry Brown's father was in office half a century ago. But now, amid one of the worst droughts on record, a group of farmers want to route some of that water back uphill.

RICH PEDRONCELLI, FILE — AP Photo

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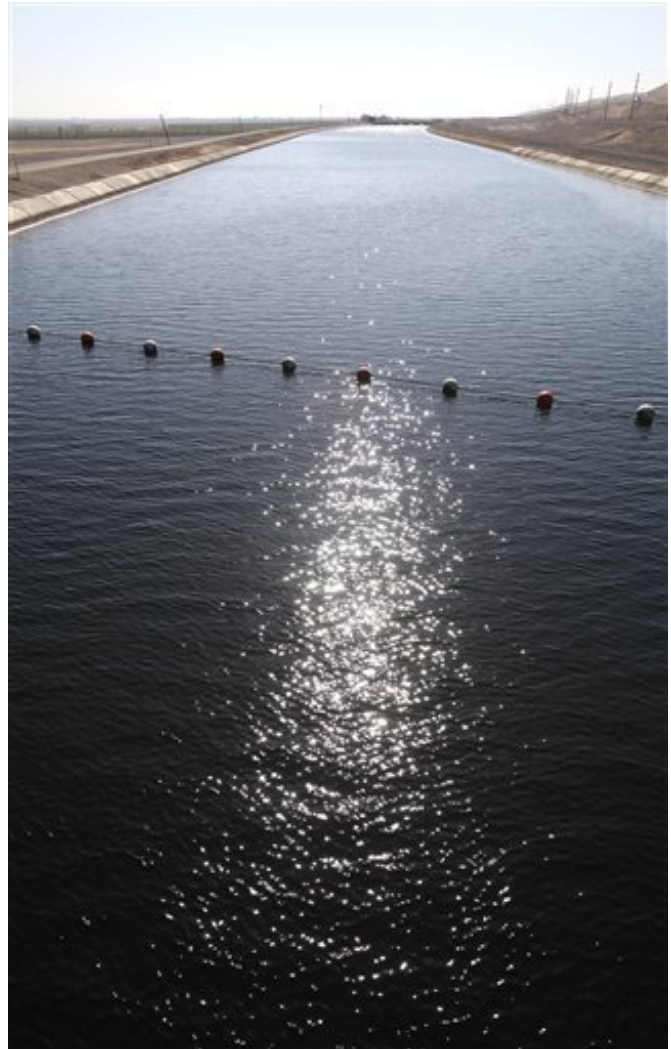
SAN FRANCISCO — Water has flowed from Northern California's snow-capped peaks to the south's parched cities ever since the California Aqueduct was built in the 1960s. Now, amid one of the worst droughts in history, state officials are considering an audacious plan to send some of the water back uphill.

State water engineers say using pumps to reverse the flow of the aqueduct would be a first in a drought. It would also be a complex engineering challenge, requiring millions of dollars to defy gravity.

Still, water agencies in the desperately dry farmlands around Bakersfield say the investment is worth it to keep grapevines, pistachios and pomegranate trees alive. Agencies as far north as the San Francisco Bay Area are talking about a similar project.

"There is no place on planet Earth where an aqueduct is designed to go backwards," said Geoff Shaw, an engineer with the state Department of Water Resources who is reviewing the proposal. "But they have a need for water in a place where they can't fulfill it, and this is their plan to fix it."

The plan the department is evaluating was drawn up by five of the local agencies, or districts, that sell irrigation water to farmers. They would bear the cost of the project, which they have estimated at \$1.5 million to



\$9.5 million.

They hope to get approval from the state in June and start pushing the water uphill later in the summer.



Long celebrated as an engineering marvel, the California Aqueduct is a 420-mile system of open canals and massive pipelines that serves millions of Californians, including those in the state's biggest population centers: the San Francisco Bay area, Los Angeles and San Diego.

Under the plan, water districts would be allowed to pump into the aqueduct the emergency supplies of water they store in underground reservoirs in Kern County, about two hours north of Los Angeles. That banked water and other extra supplies would raise the level of water within a small, closed section of the aqueduct.

Then, pumps powered by diesel engines would push the water over locks and back upstream, against the southward pull of gravity. Farmers upstream could then pump the water out to their fields.

All together, the districts want to move 30,000 acre-feet of water along a 33-mile stretch between Bakersfield and Kettleman City. An acre-foot is enough water to cover an acre to a depth of one foot.

Even if water is pumped upstream, some will still flow south, so no customers downstream will be harmed, state officials said.

The water districts came up with the idea after a bleak February forecast showed the Sierra Nevada snowpack was so thin that those who depend on the state system would get no water delivered this year.

A rash of spring storms improved the picture, but only slightly. Districts will now receive 5 percent of the water they would get in a normal year, and the supply won't arrive until September.

"Our crops need some amount of water just to keep alive," said Dale Melville, manager-engineer of the Fresno-based Dudley Ridge Water District, one of the agencies proposing the project.

The flow has been reversed only once before — in 1983, when heavy rains forced state officials to operate emergency pumps to send floodwaters northward, Shaw said.

Water agencies in the San Francisco Bay Area want to take part in a similar project that would push water along a 70-mile stretch.

"This is a year where you really have to look at every single possible way to move water around to where it's needed," said Joan Maher, operations manager for the Santa Clara Valley Water District.

As the project awaits final approval, water districts are already ordering pumps and making arrangements to get diesel engines.

Nearly half the water Dudley Ridge hopes to receive would irrigate the orchards of Paramount Farms, owned by Los Angeles billionaires Stewart and Lynda Resnick, who produce POM Wonderful pomegranate juice and Wonderful pistachios.

If it doesn't rain much next winter, the districts might seek to continue pumping the water backward in years to come, Melville said.

"Ideally we would hope it's a one-time thing," he said, "but it would be worthwhile to have this as an insurance policy."

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