

California's Water Supply -- A 700-Mile Journey

Amy Quinton, Capital Public Radio, 10-11-13

(Part 1 of a 5-part series)

Engineers drive me through a tunnel on an electric cart. We're going down to the Hyatt Power Plant, which lies under rock at the bottom of the Oroville Dam.

"It's a quarter of a mile underground and it's the length of two football fields," says Gina House with the California Department of Water Resources. "So there are five floors. This is the top floor, the generator floor."

Delivering water in California takes vast amounts of energy. This is where it all begins. House takes me 770 feet above the plant, to the top of Oroville Dam, the nation's tallest. Behind it, the Lake Oroville Reservoir can store up to 3.5 million acre feet of water.

"This is the head of the state water project, this is where all the water starts to be delivered," says House.

The State Water Project is the nation's largest state-built water delivery system, consisting of more than 700 miles of canals, reservoirs, pumping stations and power plants. From Oroville, water flows down the Feather River to the Sacramento River and into the Sacramento-San Joaquin Delta.

Carl Torgersen, the state water project deputy director, stands above the Harvey O Banks pumping plant near Tracy.

"This is the initial facility for export of water from the Delta," he says.

The Banks plant is one of two huge Delta pumping facilities, the other is part of the federal Central Valley Project.

"There are 11 pumping units and basically it pumps water about 250 feet up that hill and discharges into the first reach of the California Aqueduct," says Torgersen.

It goes fast, almost 7,000 cubic feet per second. A cubic foot is about the size of a basketball. So imagine seven thousand of them, every second. The California Aqueduct begins at the Banks Plant. The Aqueduct carries water more than 400 miles, all the way to Los Angeles.

"We deliver water ultimately to over 25 million people in the state. We provide water for irrigation for 750,000 acres of ag lands," says Torgersen.

Parts of the California Aqueduct can be seen on Interstate 5 south. They're the large pipes going over the mountain at the Grapevine.

"We are at the headworks for Chrisman Pumping Plant. Chrisman lifts the water 520 feet over this mountain," says Darren Choyce an operations superintendent with DWR.

He says the Chrisman pumps need about 44,000 horsepower.

Choyce says more impressive than Chrisman, is what happens when the Aqueduct hits the Tehachapi Mountains just 20 miles away. He takes me to the Edmonston Pumping Plant and we wait for an electric generator to turn on.

When it does, a thundering sound vibrates the ground beneath my feet. It's the Edmonston plant coming on line. 14 pumps push the water 2,000 feet up the mountain, the highest water lift in the world. Choyce says it consumes about 60 megawatts, enough electricity for a small city.

"That's what's pumping the water through: 600 rpms, 80,000 horsepower, running on 14,400 volts." It's clear from the smile on Choyce's face that he's thrilled by the power.

"I love it. Producing 2,000 psi to push water 2,000 feet up over the mountain," says Choyce.

Choyce says each pump could fill an Olympic size swimming pool in six seconds.

From Edmonston, water travels south, far south. Not just to LA, but to San Diego.

Tiff Nelson is sitting on his porch overlooking a swimming pool in his backyard in a northern San Diego suburb. His irrigation system keeps it green and lush.

"We've got some Oleander trees as hedges, some Melaleuca trees," says Nelson, describing his lawn. I ask him how often he thinks about his water.

"Normally I look at my grass to see if it's green enough to see if I need water. But when it's the rainy season, for what counts as the rainy season in San Diego, I'll turn my water off," says Nelson.

Nelson knows he gets water from the Colorado River. He tries to conserve it as well. He says he will even use rain water that pools on top of his swimming pool cover to water the yard first, before turning on an irrigation system. But he didn't know that 20-percent of his water comes from the Sacramento-San Joaquin Delta.

"It's always available and I think sometimes people forget we're really a desert here and if you go out into the underdeveloped areas you'll see what San Diego looks like if you don't water," says Nelson.

But pumping Delta water to Central Valley farms and San Diego lawns comes at a huge cost. The Delta ecosystem is crashing. Endangered fish – already suffering from habitat loss and pollution- continue to die at the pumps that send the water south. The state's solution is the Bay Delta Conservation Plan. It's designed to improve the ecology and provide a reliable water supply. But its proposal to build two huge tunnels to send water south has created a political firestorm. Finding the right balance may prove to be the state's biggest and most contentious debate.