

THE ST. FRANCIS DAM: CALIFORNIA'S WORST CIVIL ENGINEERING DISASTER

By John S. Caragozian

The 1928 St. Francis Dam collapse unleashed a flood that killed almost 500 people in Los Angeles and Ventura counties. It is regularly listed as one of the nation's worst civil engineering disasters, yet is largely unknown to today's Californians.

Modern southern California began with an aqueduct that brought water 233 miles from the Owens Valley to arid Los Angeles. Completed in 1913, the aqueduct allowed the city of Los Angeles's population to grow from 319,000 in 1910 to 1,230,000 by 1930 and, during those decades, to become the nation's fifth largest city.

The individual most responsible for the aqueduct, William Mulholland, was a self-educated immigrant who played a key role in the Progressive movement's transformation of L.A.'s privately owned water system into a municipally owned one. As the new chief of the city Bureau of Water (later, the Department of Water and Power), Mulholland led the city's effort to buy Owens Valley water rights and secure political support for the aqueduct and then to engineer, finance, and construct it.

While the aqueduct benefitted Los Angeles, it had enemies. Many investor-owned utilities characterized municipal utilities as un-American socialism. Privately owned Southern California Edison especially opposed the aqueduct's hydroelectric capacity: Near the aqueduct's southern terminus, water falling through pipes (called "penstocks") in L.A. County's San Francisquito Canyon would generate 90% of the city's electricity, displacing SCE as the city's primary electricity supplier. See Jon Wilkman, "Floodpath: The Deadliest Man-Made Disaster of 20th Century and the Making of Modern Los Angeles," at 15-17, 57 (2016).

Owens Valley residents also fought the aqueduct. Their farms, ranches and businesses withered as almost all local water was diverted south. By the 1920s, Owens Valley residents had undertaken "direct action," dynamiting the aqueduct at least 10 times to prevent water from flowing out of their valley. *Id.* at 66-74.

This damage was repaired, but sabotage continued despite L.A.'s armed guards and private investigators. Fearful for L.A.'s water supply — 75% of which by then flowed from the Owens Valley — Mulholland wanted to store at least a year's water supply in reservoirs. See William Kahrl, "Water and Power: The Conflict over Los Angeles' Water in the Owens Valley," at 311-12 (1982).

Mulholland eventually chose San Francisquito Canyon as a reservoir site. It would also provide a steady flow of water to the downstream hydroelectric plant.

San Francisquito Canyon joined the Santa Clara River in what is now the city of Santa Clarita. From there, the river flows west through a valley of rich farmland, mostly in Ventura County, before emptying into the Pacific Ocean.

At that time, most dams were earthen, but a few newer ones were concrete. This dam, named the St. Francis, would be concrete and arched, with upstream water pressure distributed along the dam's face to canyon wall abutments.

The original plans called for the dam to be 175-feet high and the reservoir to store 30,000 acre-feet of water. However, Mulholland wanted more storage and (a) raised the height to 185 feet and the capacity to 38,000 acre-feet without otherwise altering the original plans, and (b) built an identical dam in Hollywood with a smaller reservoir, which is today's Lake Hollywood. See Charles Outland, "Man-Made Disaster: The Story of St. Francis Dam," at 29-30 (rev. ed. 1977).

Like the aqueduct, the St. Francis dam was constructed by city employees using cement from a city-owned plant. The dam was completed in 1926, and the city drew on its stored water the following year after yet another Owens Valley dynamiting. By 1928, the St. Francis reservoir was re-filled to capacity. *Id.* at 48-51.

On Sunday morning, March 12, 1928, the St. Francis dam tender noticed the dam leaking muddy water, a possible sign of foundation instability. He phoned the city water bureau's headquarters in downtown Los Angeles. Mulholland and his top assistant drove to the dam and spent two hours inspecting it. They concluded that the dam was safe and departed.

That night, at 11:57, city electrical operators noticed a voltage drop and tried to phone the hydroelectric plant below the dam, but the line was dead. The St. Francis dam had suddenly collapsed, and a 140-foot wall of water and debris roared down San Francisquito Canyon and spread into the Santa Clara River valley.

By 12:45 a.m. on March 13, city employees knew that the hydroelectric plant was out, but sent no warnings to Ventura County until 1:20 a.m. Likewise, SCE knew that its lines also in San Francisquito Canyon had shorted out, but failed to alert anyone, including its own work crew camped near the river.

When warnings were finally sent, Ventura County law enforcement drove along the Santa Clara River, urging residents to seek higher ground. Telephone operators in towns along the river stayed at their posts warned residents. Whistles, sirens and bells provided additional warnings.

By daylight on March 13, devastation was apparent from the dam site to the ocean. All of the city employees at the dam and downstream hydroelectric plant died, along with families housed there. Of the 150-person SCE crew, over half died. Further downstream, hundreds more, especially Mexican-American agricultural workers housed along the riverbed, died. Confirmed dead and missing totaled 493, but an exact number cannot be known.

Property damage was also enormous. Highways, train tracks, bridges, pipelines and other infrastructure were destroyed. The deluge swept away or damaged hundreds of residences and other buildings and eroded or buried thousands of acres of farmland, including trees and crops.

The legal repercussions evolved in unexpected ways.

State, city, L.A. County and Ventura County officials and agencies immediately launched a variety of investigations; they all agreed that the dam's collapse was sudden and complete, but nothing else commanded unanimity. Even now, engineers and geologists disagree on the cause. Affixing blame — based on then-current knowledge of geology and construction — is even more elusive. *See, e.g.,* Charles Outland, *supra* at 193-222; Jon Wilkman, *supra*, at 259-66.

In 1928, both Los Angeles and Ventura County wanted to avoid piecemeal litigation over the disaster and formed a "Joint Restoration Committee" co-chaired by the L.A. Chamber of Commerce president and a leading Ventura County farmer and rancher Charles Teague. The committee and its third-party experts received and adjusted Ventura County residents' claims, and L.A. paid the claims or repaired or replaced property without regard to a liability determination. This process minimized L.A.'s adverse publicity and legal expenses. Meanwhile, Ventura County residents received prompt compensation.

A broader agenda was also at work here. The U.S. Congress was debating legislation to build Hoover Dam. L.A. was to be a major recipient of Hoover Dam's water and electricity and wanted to avoid giving Arizona (which opposed the dam) and SCE (which wanted some of L.A.'s electricity share) additional ammunition by keeping the disaster in the news and contesting compensation of victims.

The committee's claims process was imperfect. The committee capped individual death payments at \$5,000 (equivalent to \$80,000 in 2021), and anecdotal evidence suggests that Mexican-Americans received less than whites. Charles Outland, *supra* at 188. Lawyers who wanted to file lawsuits were escorted out of Ventura County, a practice that Teague later admitted was illegal but "warranted under the circumstances." Charles Teague, "Fifty Years a Rancher" (1944), at 186-87. Still, the process approximated net settlements and judgments in the handful of actual lawsuits. Jon Wilkman, *supra* at 224.

L.A. ultimately paid claims of \$28 million (\$450 million in 2021). City taxpayers challenged payments on grounds that liability was undetermined and voters had not approved emergency bonds, but courts rejected both challenges. Charles Outland, *supra* at 183; *Shelton v. City of Los Angeles*, 206 Cal. 544 (1929).

Today, the St. Francis dam site is an easy stroll off San Francisquito Canyon Road, but no sign or memorial exists, save for concrete debris and hillside scars.

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