

[Adding the figures up on Hetch Hetchy](#)

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THERE ARE at least a few million good reasons why San Francisco needs to fix the aging and fragile Hetch Hetchy water system within the next decade, but the most compelling one is a simple number: 37.

That figure represents how many years it has been since city engineers were able to inspect the condition of the Irvington Tunnel, a critical part of the pressurized labyrinth through which 95 percent of all the crystal clear Sierra water -- on which 2.5 million Bay Area residents depend -- passes.

The tunnel, located in a natural depression between two active earthquake, faults stretches not quite four miles along the Irvington District in Fremont. Although the tunnel is historically stronger than other parts of the 160-mile Hetch Hetchy system, no one actually knows just how secure or dependable that section remains. Why? Because San Francisco can't turn off the water, or some 2 million users would find that the tap has truly run dry.

"We simply don't know what kind of shape the tunnel is in," Tony Irons, the deputy general manager of the San Francisco Public Utilities Commission told me last week. "And there's no way to find out. That is a real problem."

If that's not enough to alert regional water users, there are plenty of other alarms ready to go off regarding the Hetch Hetchy renovation plan. That plan, years overdue, is expected to be updated and presented to the commission Feb. 8. Engineers will propose a new design and revamped construction schedule that may be the closest thing to reality the system's overseers have viewed since the state threatened to take authority over Hetchy Hetchy away from San Francisco a few years back.

That presentation will begin a lengthy environmental-review process that is expected to last up to two years. Once that is complete, the earliest city officials could begin construction on a number of huge projects (most likely starting with a tube that parallels the Irvington tunnel so there is a safety valve, should the Irvington ever fail) is 2007. If you think city officials aren't gulping about the prospect of system failure, then you've never seen pictures of some of the cracks and eruptions that have appeared in the majestic system in recent years.

Hetch Hetchy is an engineering marvel, arguably among the greatest aqueducts ever built. Its vast array of dams, reservoirs, conduits, pipelines, powerhouses and tunnels were all brilliantly laid out by former City Engineer Michael O'Shaughnessy, who used gravity, not pumps, to deliver 300 million gallons of water a day from high in the Sierra across 160 miles to sea level.

But as with most things nearing the century mark, Hetch Hetchy is showing its age. Four years ago, the state agency that oversees dam safety declared the Calaveras Reservoir south of Sunol seismically unsafe, and PUC officials drained about half of the dam's water supply to reduce the pressure on its earthen walls.

In recent years, sections of the massive San Joaquin pipeline have cracked and sent geyser-like water spouts into the air. The city's water agency must also replace the pipelines that cross the bay above ground near the Dumbarton Bridge -- but it is planning to do so with an underwater tunnel that could prove a formidable and daunting engineering challenge.

And it's still not known how quickly any of the rebuilding plans can get underway -- that decision will rest with the San Francisco Planning Department and a host of other agencies. Two years have passed since San Francisco and Peninsula residents approved \$3.6 billion in bonds to fix Hetch Hetchy, but the retrofit has stalled because the PUC couldn't come up with a workable timetable or a clear set of project priorities.

Adding to the urgency is the threat of seismic activity. The U.S. Geological Survey estimated that there is a 62 percent likelihood of an earthquake along one of the fault lines that crisscross the route of the Hetch Hetchy system. As Irons said: "It's not a question of if we'll have an earthquake. The only question is when."

Irons, the former city architect who oversaw the renovation of San Francisco's City Hall and the Opera House, came out of retirement to be the project point man under PUC General Manager Susan Leal. He said the agency has moved with great urgency in the last four months to get a handle on the retrofit plan and said he fully expects that the city can complete it on schedule in 10 years.

A lot of people better hope he's right. For there is an even more alarming figure than the one associated with the Irvington Tunnel: \$28 billion. That's the estimated cost to the region if Hetch Hetchy were to fail in an earthquake and the tap were to run dry for two months.

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