Santa Clara Water Conservation System (1936)

Dedicated as a California Historic Civil Engineering Landmark by the San Francisco Section, ASCE

Construction of Coyote Dam and five others for the Water Conservation District provided much needed work for the Santa Clara Valley during the Great Depression.

At the opening of the twentieth century, the Santa Clara Valley, just beginning its change from a cattle-grain-growing economy to a vine and orchard center, enjoyed a surplus of water. The ground water level was so high that, when wells were drilled, water flowed without pumping, and the underground water pressure was great enough to force the water out at the surface, creating an artesian well.

A succession of drought years beginning in 1915 saw the start of widespread pumping as the water table dropped. By 1920, 67 percent of the land in the valley was under irrigation, and the population was steadily increasing in the urban areas. By 1929, a dramatic drop in the water table of 50 feet in four years had caused widespread damage from land subsidence.

Prominent San Francisco engineers Fred H. Tibbetts and Stephen E. Kieffer spent years in the 1920's preparing a report covering every phase of the Santa Clara Valley's water problem, and made recommendations for water conservation. Still used as a guide for action, their report called for the formation of a water conservation district to build flood control dams and channels, percolation beds and other projects.

Led by prominent valley citizens under the leadership of Leroy Anderson, a water conservation committee fought a long and frustrating battle to have the district formed. What made the idea difficult to sell was its very novelty. Nowhere else in the arid West was a water conservation district being proposed. In areas where there were no federal irrigation projects, local projects envisioned either flood control or irrigation, not both. Even in Los Angeles, whose first-in-the-nation flood control district had built spreading grounds (percolation areas) as early as 1917, there were no major year-round reservoirs to augment the percolation grounds. Little wonder, then, that the conservative Santa Clara Valley farmers viewed the proposed district skeptically. At two elections in 1927 and 1928, the proposal was defeated, but

Coyote Percolation Dam. The cable car at right trips each dam section during excessive flows.

in November 1929, as the water table dropped to a frightening 100 feet below ground level, a new water conservation district was approved by Santa Clara Valley residents by the margin of nine to one.

Building on the earlier Tibbetts-Kieffer report, engineers studied the valley's principle watersheds where dams could be built to impound rainy season runoff and release it in the dry season to replenish the groundwater through percolation beds. A $2 million bond issue approved in 1934, augmented by federal WPA money, was used to construct the first six conservation dams, which were completed in 1936.

With the first rains of the winter of 1936-37, the new dams, Vasona, Almaden, Guadalupe, Stevens Creek, Calero and Coyote, began to impound water, and not a moment too soon. The average depth of water had now dropped to 131 feet, when only 20 years earlier it had been only 56!

At first the new conservation system worked beautifully. By 1943, the water table had risen to its early 1920's average of 50 feet, but in 1944, once again it began to drop. Spurred by wartime increases in industry and population, in addition to year-round farming to raise more crops for the war effort, the valley's water use was rising beyond anything the planners had anticipated. Coupled to this was a series of dry years in the late forties.

Plans were completed to construct two additional dams for water storage. Lexington Dam, built after the rail line to Santa Cruz was abandoned, and Anderson Dam on the Coyote River, forming the largest reservoir on the system, were completed in the early 1950's.

In 1952, the conservation district was augmented by the addition of a south district, for which two dams, Chesbro and Uvas, were built in the fifties.

Today, the Santa Clara Water Conservation District system operates more than the flood control dams, reservoirs, percolation areas and irrigation canals of its original charter. It includes a system of sewage treatment and water reclaiming plants, imports water from the Central Valley and conducts cloud seeding, all in an effort to augment the water supply of an area which has become one of the most rapidly growing population centers in the nation.

TECHNICAL DATA

Location	Santa Clara County, California (county seat in San Jose)
Dates	District formed: 1929 Construction of major facilities: 1932-52
Engineers	Frederick H. Tibbetts (1882-1938) and Stephen E. Kieffer did the original design and conceptual work. Walter Hunt was chief engineer in charge of construction of all dams.

Dimensions of dams and reservoirs

Almaden
Built: 1935
Reservoir capacity: 1,780 acre feet
Dam type: rolled earth fill
Fill contains 250,000 cubic yards

Anderson
Built: 1950
Reservoir capacity:
91,280 acre feet
Dam type: rolled earth and rock fill
Fill contains 3,320,000 cubic yards

Calero
Built: 1935
Reservoir capacity:
10,160 acre feet
Dam type: rolled earth fill
Fill contains 550,000 cubic yards

Coyote
Built: 1936
Reservoir capacity:
23,700 acre feet
Dam type: rolled earth and rock fill
Fill contains 1,060,000 cubic yards

Guadalupe
Built: 1935
Reservoir capacity: 3,740 acre feet
Dam type: rolled earth fill
Fill contains 520,000 cubic yards

Lexington
Built: 1952
Reservoir capacity:
20,210 acre feet
Dam type: rolled earth fill
Fill contains 2,124,000 cubic yards

Stevens Creek
Built: 1935
Reservoir capacity: 3,600 acre feet
Dam type: rolled earth fill
Fill contains 530,000 cubic yards

Vasona
Built: 1935
Reservoir capacity: 410 acre feet
Dam type: rolled earth and rock fill
Fill contains 70,000 cubic yards

SPECIAL NOTES

1. This system is the first, and only major, instance of a major water supply being developed in a single groundwater basin involving the control of numerous independent tributaries to obtain virtually optimal conservation of essentially all of the sources of water flowing into the basin.
2. This water supply development facilitated the post-World War II growth of the Santa Clara Valley into one of the major metropolitan areas of the country.