

Farmers' Foresight: A History of Santa Clara Valley Reservoirs

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Introduction

Every morning as I crawl out of my bed something out of my window catches my eye: water. Today it's blue, but tomorrow it may be brownish, or have a green tint. The color changes with the sky. How much water I see also changes over time.

I live on the banks of Anderson Reservoir. In the more than four years I have lived here, I have seen the water level rise and fall over and over again. When I look at the reservoir, I can almost feel whether it's summer or winter, or whether it's been a dry year or a stormy year.

Reservoirs have a direct effect on not just me, but everyone in Santa Clara County. They provide drinking water and water to grow plants. When I began researching to do this paper I was surprised to learn that reservoirs stopped the whole valley from sinking. In this paper, I will show you how the reservoirs came to be and how we have come to rely on them.

First Demand for Water

Demand for water first appeared to be a problem in Santa Clara County in the mid-1800s as the area began to develop. Before the 1850s California was under Mexican rule. Each Rancho in Santa Clara Valley had its own water source from ponds and rivers and did not need to pump water from underground, but things began to change.¹ The United States conquered the territory in 1846, bringing more people to the area and increased agriculture.²

The town site of San Jose was surveyed in 1847. The limits of the town were fixed at Julian Street on the north, Eighth Street on the east, and Reed Street on the south, and Market Street on the west.³ In the same year, Benjamin Campbell built the first sawmill in the county. The mill was located about three miles above Saratoga.

In November 1849 the Constitution of the State was adopted, and San Jose was named the state capital. California became the 31st state on September 9, 1850. By 1850 San Jose had a population of 3,000.² The total population was more than 100,000.⁴ San Jose was located on the main highway of north-south traffic in California, making it easy for new settlers to make the trip. John Whistman established the first stage service between San Jose and San Francisco. The trip took nine hours.⁵

In late January of 1854 the first well was sunk in San Jose. At just 80 feet, water was struck.¹ The water came from the underground aquifer, a natural subterranean

1. *Water in the Santa Clara Valley: A History*. De Anza College, 1981, p.3.

2. Hill, Frederic. *History of San Jose and Surroundings with Biographical Sketches of Early Settlers*. San Francisco: Unknown, 1871, p.263-5.

3. *Historical Atlas of Santa Clara County*. San Francisco: Thompson & West, 1876, p.11

4. *The World Book Encyclopedia*. Chicago: World Book Inc, 1997. Vol. C, p. 62.

5. Stephen M. Payne, *Santa Clara County: Harvest of Change*. Northridge, CA: Windsor Publications, 1987, p.65.

reservoir. Aquifers are common in Santa Clara Valley, often reaching several thousand feet under the ground. This first well in San Jose was impressive. Water erupted ten feet above the ground.

At the same time, agriculture was becoming a promising industry in Santa Clara Valley. Local farmers learned that a farmer in what is now southern Alameda County successfully grew a wheat and barley crop in Yolo loam soil. The same soil was found in Santa Clara County, so local farmers began to grow grains. The soil was so rich that Commodore Robert F. Stockton's ranch grew grain for ten years without adding any Fertilizer. In 1852 19,066 acres of grain were harvested in the valley. Four years later that number had grown to 24,500 acres.⁶

Farmers also began planting fruit trees and vineyards. In particular, they planted orange, lemon and nut trees. In 1856 Pierre Pellier, a French agriculturist, found that the soil in the Santa Clara Valley was perfect for raising French prunes. Within the next 20 years, dried prunes from Santa Clara Valley became popular all over the country.⁷

The San Jose and San Francisco railroad was completed in 1864. Agriculture received a big boost, because Santa Clara County was allowed to send local grain and produce to the San Francisco. Then in 1870 The South Pacific Coast Railroad was constructed through Pajaro Gap in Monterey County. Farmers were now able to send their crops south. Commercial fruit growing became increasingly important.⁷

Water was needed to support this new agricultural economy, and since the

6. Stephen M. Payne, *Santa Clara County: Harvest of Change*. Northridge, CA: Windsor Publications, 1987, p.69.

8. Machado, Kathy, *Santa Clara Valley Water History*, www.scvwd.dst.ca.us/school/scvwhist/whist1.htm p.6.

farmers saw the first gushing success from the 1854 well, they continued creating more wells as they planted more crops in the years to follow. By 1865 there were 500 artesian wells in Santa Clara Valley. An artesian well is a well that taps ground water that is under pressure. Misuse of the wells became evident as people complained to the local newspapers that wells left uncapped were creating a water shortage.⁸ This was the first glimpse of stormy waters ahead.

⁸ *Water in the Santa Clara Valley: A History*. De Anza College, 1981, p.5.

Land Subsidence and Drought

By the end of the 19th century it was common for farmers to collect their own water out of the ground. They relied on artesian wells and windmill pumps. However, nature could not keep pace with the rapid rate of water being taken out of the ground. Santa Clara Valley received only half of its average rainfall during the years 1897-1899. this caused more and more wells to be sunk for farmer's thirsty crops.⁹

Systems of transportation continued to improve, creating greater demand for fruit and vegetables, and also for water. With two more dry seasons, 1903-1904 and 1907-1908, the areas of Campbell and Cupertino alone had up to 14,000 acres under irrigation.

This trend of irrigation showed no signs of letting up but the water supply was anything but endless. Only 29 percent of the valley was irrigated in 1912, but just eight years later that percentage had increased to 67 percent, including 90 percent of the orchards. Almost all of that irrigation came from ground water from wells. By 1915, Santa Clara Valley aquifers were being drained of more than 8 billion gallons of water a year.¹⁰ The groundwater level dropped rapidly because the water was slow to replenish itself.¹¹ In those years the rain that fell in the valley was largely wasted. Up to 69 percent of rainfall every year washed into San Francisco Bay.¹²

In fact, Santa Clara Valley was sinking, but geologists may not have been aware of this alarming fact immediately. Later studies would show that from 1916 to 1966 land surface subsided 12.7 feet in San Jose. Engineers learned the subsidence was a direct

9. *Water in the Santa Clara Valley: A History*. De Anza College, 1981, p.6

10. Poland, J.F., and Ireland, R.L., *Land Subsidence in the Santa Clara Valley, California, as of 1982*. Washington: United States Government Printing Office, 1988, p.f1.

11. Martin, Richard G., *Water Conservation in Santa Clara Valley*, Thesis, Department of History, Berkeley, University of California, 1949, p.18

12. Tibbetts, Fred H, and Kieffer, Stephen E, *Report to Santa Clara Valley Water Conservation Project*, Publisher and location unknown, 1921.

result of groundwater depletion. Between 1916 and 1966 four times as much water was being drained from the underground aquifers compared to the amount of water coming in from rain and runoff.¹⁰ Land in Santa Clara County may have continued sinking, causing calamity but farmers foresaw the trouble and took steps that would benefit their ~~ancestors~~ descendants

10. Poland, J.F., and Ireland, R.L., *Land Subsidence in the Santa Clara Valley, California, as of 1982*. Washington: United States Government Printing Office, 1988, p.f1.

Farmers' Foresight

By the turn of the 20th century, water was a clear concern for Santa Clara Valley farmers. They needed more than nature could provide. In 1913, a San Francisco irrigation expert passed through San Jose.¹¹ He told some local farmers about a new government program to pay for water conservation projects. June 12, farmers enthusiastically crowded into a meeting to learn more about the program. However, during the meeting, a disappointing telegram arrived from local congressman, E.A. Hayes. It said that the government program was only intended for dry regions, not lush regions like Santa Clara County. The meeting secretary said it was a shame, because Santa Clara Valley needed the money to stop it from "reverting to a desert."¹²

Dry years were often followed by wet years in the Santa Clara Valley. Some farmers thought the water source simply would replenish itself, so they did not try as hard as they might to find ways to conserve water for irrigation. Several proposals were introduced to build reservoirs in the years leading up to WWI and during the war, but none was seriously followed. Some farmers were too busy making money off their crops to worry very much about where future water would come from. Farmers were like everyone else in the entire country, distracted by WWI.¹³

Not until the Farm Owners and Operators Association met on December 20, 1919 did serious action mount toward conservation. This association appointed a committee which looked into the problem over the next few weeks. January 22, 1920, the group presented a resolution to the Santa Clara County Board of Supervisors, opposing the

11. *Water in the Santa Clara Valley: a History*. De Anza College, 1981, p.7.

12. *San Jose Mercury Herald*, June 12, 1913, p.1.

13. Martin, Richard G., *Water Conservation in Santa Clara Valley*, Thesis, Department of History, Berkeley, University of California, 1949.

water wasted by artesian wells. The Association vowed to stay on the water conservation issue.

The group got off to a rocky start. Soon after the Board of Supervisors meeting, the County Chamber of Commerce objected, saying that people other than farmers should be involved in decisions over water. A broader group was formed which included members from the Chamber of Commerce, the Board of Supervisors and the Grange and Trades Union. Several farmers resigned in protest, but the group carried on with a new name, the "Santa Clara Valley Water Conservation Committee."

In 1920 the group hired engineers Fred H. Tibbetts and Stephen E. Keiffer to survey the valley's water resources. They measured wells and looked for reservoir sites. They also studied average rainfall and water tables, climate and geology. Their study, which turned out to be a landmark in Santa Clara County history, recommended constructing 17 large reservoirs, dams, pumping stations, and concrete conduits. Tibbetts and Kieffer said this would all cost just under \$11 million.

To build this project, Santa Clara Valley would need to get money from taxes, there was a hitch. According to the Jones Act, which became law in 1921, a water district must be in place before citizens would pay for reservoir construction.¹⁴ This was easier said than done. Proposals to create water districts were defeated in elections in both 1921 and 1925. After the last defeat the Water Conservation Committee was abandoned.

The efforts of one man helped save the day. A Saratoga orchardist and former agriculture professor, Leroy Anderson, took up the cause of getting the word out about

14. Payne, Stephen M, *Santa Clara County: Harvest of Change*. Northridge, CA: Windsor Publications, 1987, p.137.

the need for water conservation. He helped form the Santa Clara Valley Water Conservation Association on December 1, 1926. The group lobbied hard over the next few years and gained the support of both farmers and the San Jose Chamber of Commerce. Finally, on November 5, 1929, voters approved creating a water conservation district. The margin of votes was nearly nine to one. After the general election, the board of directors elected Leroy Anderson president of the group and Fred Tibbetts chief engineer.¹⁵

15. Payne, Stephen M, *Santa Clara County: Harvest of Change*. Northridge, CA: Windsor Publications, 1987, p.139.

Reservoirs Created

The "Valley of the Heart's Delight" was what the world came to call Santa Clara County, because of a booming fruit and nut industry that had taken root by the 1930s. A water district was in place, but water was still a problem. The same voters who had supported the creation of a water district were now holding tight to their wallets, due to the Great Depression. In a 1931 election, they defeated the \$6 million bond needed to build a series of dams.¹⁶

Things started to look up in 1934, even though economic hard times persisted. Voters approved a bond of \$2 million to construct the first six dams and reservoirs: Almaden, Calero, Guadalupe, Stevens Creek and Vasona. The voters agreed to this largely because they had assurances that the federal government would pay for 30 percent of the project. The government came through. Soon after the election, the Public Works Administration confirmed a grant of \$683,000.¹⁷

Work immediately began on the dams and reservoirs. It was hard, physical labor. Ditches were dug by men with shovels and axes. The dirt they removed went into the trucks, often loaded by hand. Bulldozers in the 1930s were not as efficient as they are now. They could push only one cubic yard at a time, and nearly 3,000,000 cubic yards of fill had to be moved. Rates of pay for workers ranged from \$6 a day for truck drivers to \$12 a day for underground shovel operators.¹⁸

The first five dams were completed by 1935, but Coyote Dam was delayed.

16. Payne, Stephen M, *Santa Clara County: Harvest of Change*. Northridge, CA: Windsor Publications, 1987, p.139.

17. Machado, Kathy, *Santa Clara Valley Water History*, www.scvwd.dst.ca.us/school/scvwhist/whist1.htm, p.6.

18. *Water in the Santa Clara Valley: A History*. De Anza College, 1981, p.55.

Construction plans had to be redesigned for Coyote, because engineers discovered that it straddled the Hayward Fault, an active earthquake zone. The base thickness of the dam had to be increased from 500 feet to over 900 feet. Crews brought in rock from a quarry more than a mile away. Men worked around the clock on Coyote Dam, living in a tent city near the dam site. They had to stop for winter rains in December 1935, and January 1936, and soon ran out of money for the project. Voters helped them out on May 12, 1936, with a bond issue of \$400,000. The project was finally complete on December 3, 1936.¹⁹

Plans were put on hold to build another important dam, Lexington, on Los Gatos Creek, because of transportation needs. In 1933 the Santa Clara Valley Conservation District learned that Highway 17 was to be built through the site it had selected for the dam and reservoir. The Conservation District asked the State Highway Commission if its planned roadway could be relocated to a higher elevation but the commission would not consider the idea. As a result, plans for Lexington were abandoned for a time.

After several years of delays, Santa Clara County Assemblymen John Thompson and Robert Kirkwood were able to convince the California State Legislature to approve a \$2.5 million appropriation bill to relocate Highway 17, but more fights lay ahead before Lexington could be built. The state said it would only grant the \$2.5 million if Santa Clara County voters passed a bond issue within two years. The Santa Clara Valley Conservation District set out to convince voters to pass the measure, saying how future jobs in the valley depended on water. Voters finally agreed, passing a \$2.5 million dollar bond measure in October of 1947, by 72 percent of the vote. The highway was rerouted

19. *Water in the Santa Clara Valley: A History*. De Anza College, 1981, p69.

in December, 1951. Construction began on Lexington in the spring of 1952 and was complete by the fall.

Meanwhile, while Lexington was taking shape, the water district worked on building a reservoir at another location: a long, natural gorge located three miles east and parallel to Highway 101, in Morgan Hill. Santa Clara County voters passed a bond measure to build the reservoir in the summer of 1949; the total cost of buying the land and construction was estimated to be \$3 million. Because no federal or state money was needed, and control of the project remained in Santa Clara County, the reservoir and dam were completed in record time. They were ready for operation by autumn of 1950, and named Leroy Anderson Dam and Reservoir. It would become the largest of all the other reservoirs combined, with a capacity 91,280 acre feet of water.²⁰

Two more reservoirs and dams were added to the Santa Clara Valley Water District before our modern-day system would be complete. In 1955 Chesbro Dam and Reservoir were built on Llagas Creek, and in 1956 Uvas Dam and Reservoir were built on Uvas Creek. Both of these latest additions were projects of the South Santa Clara Valley Water District, which had been formed on August 1, 1938.

People living in south county formed the South Santa Clara Valley Water District to protect their own interests, although the group had the same basic goals as the Santa Clara Valley Water District: to prevent land subsidence, cracked well casings, the drying of wells and the reduction of creeks' floodwater capacity. The South Santa Clara Valley Water District later merged with Gilroy's Gavilan Water Conservation District, and was

20. Payne, Stephen M, *Santa Clara County: Harvest of Change*. Northridge, CA: Windsor Publications, 1987, p.141.

annexed into the Santa Clara Valley Water District in 1987.²¹

21. Conversation with Mike Di Marco, Santa Clara Valley Water District Media Relations Officer, April 18, 2001.

Conclusion

Today, California water is in short supply from time to time, as more people move into the state and we experience periods of dry years. But imagine how much worse things would be if Santa Clara County didn't have its ten reservoirs. Imagine if there hadn't been a Tibbett's Report to recommend that we build reservoirs. Behind that valuable report, there was a group of farmers who saw there was a problem and took it into their own hands to solve it. Farmers fought for creation of every reservoir, educating the public about the needs of the future.

Without those persistent farmers of the past, Santa Clara Valley would not be the successful area it is today. Back then the farmers couldn't have known how populated the area would become today. They would be shocked to see their orchards subdivided and developed for houses and schools. The water that is in the reservoirs helps support the booming hi-tech industry that we have today.

The Santa Clara County Water District just didn't give us reservoirs. It gave us: 393 recharge ponds, 17.3 miles of canals, 142 miles of pipeline, 8.4 miles of tunnels, three treatment plants and three pumping stations.

Now, whenever I look out my window I don't just see a reservoir. I see the result of years of effort, and effort that paid off.

Reservoir Chart

Reservoir	Storage Capacity (Acre-Feet)	Surface Area (Acre)	Year of Construction	Dam height (Feet)
Almaden	1,553	59	1935	105
Anderson	89,073	1245	1950	240
Calero	10,050	347	1935	98
Chesbro	8,952	265	1955	95
Coyote	22,925	648	1936	120
Guadalupe	3,228	79	1935	129
Lexington	19,834	475	1952	195
Stevens Creek	3,465	92	1935	120
Uvas	9,935	286	1957	118
Vasona	400	57	1935	30

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