Cachuma Project

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The Cachuma Project

The Cachuma Project, proclaimed by Commissioner Michael Straus in 1949 as "Reclamation's first Seacoast project," attempted to capture a highly variable Southern California stream for the use of the historically water-deficient communities of the South Coast area, including the venerable, old Spanish mission city of Santa Barbara, its smaller, urban neighbors, and outlying agricultural lands. The basis of the project was storage of floodwaters of the nearby Santa Ynez River. This river basin's runoff owed itself entirely to precipitation during the so-called rainy season (October-April), when 95% of the area's rainfall usually occurred and drained away almost immediately. Consequently, trapping what rain fell was critical, especially during the inevitable dry cycles when users could rely only on the storage of past seasons' remaining surplus. Although the project's water supply proved sufficient in serving Santa Barbara County from the project's inception in the mid-1950's, the 1990's began quite differently when a prolonged dry spell forced frantic county water agency officials to look at additional options for a more dependable water supply. Due to the unreliability of Southern California precipitation, it became evident that the Cachuma Project was no longer the "be all, end all" solution it was originally planned to be for the South Coast area's long-standing water woes.

Project Location

The Cachuma Project works are located in the Santa Ynez River Basin and the South Coast area which occupy the southern half of Santa Barbara County. The South Coast area included in the project is a narrow, highly-populated coastal strip about twenty-five miles long and two to five miles wide, lying between the Santa Ynez Mountains and the Pacific Coast. In this area lie the city of Santa Barbara and the suburban and agricultural lands of Goleta, Summerland, Montecito, and Carpinteria. All receive water from the Cachuma Project.

The annual average flow of the Santa Ynez River is 66,000 acre-feet (a-f). The river basin and the South Coast area are characterized by a short rainy season in the winter and a long dry season in the summer. The region is from time to time subject to strong storms off the Pacific, consequently, rainfall can vary widely. Santa Barbara weather records show annual rainfall measurements varying from four to forty-five inches, with an average of 18.4 inches per year.[1]

The primary features of the project are the Bradbury Dam (formerly named the Cachuma Dam, the name was changed in 1971 to honor local water proponent Brad Bradbury) which is located on the Santa Ynez River about 25 miles northwest of Santa Barbara; the Tecolote Tunnel, which transports project water under the Santa Ynez mountain divide to the South Coast area; and the South Coast Conduit, which connects to the tunnel and distributes water across the South Coast area to member water districts, running roughly parallel to the coast and about two miles inland, to its eastern terminus in Carpinteria.

Historic Setting

Prehistoric Setting

When the Spanish first settled in the South Coast vicinity in the late 18th century, they observed at least 15,000 Native Americans also living in the area. These natives included members of the Tecolote, Lompoc, Sisquoc, and Suey tribes, and lived mostly in small clusters both near the sea and where a freshwater source was available. These sites were called "rancherias," and on account of the large accumulation of shells found, became known as "shell mounds," which are still found in the area. Petrographs, too, can be seen today, particularly to the northwest of Santa Barbara, where the Painted Cave and prominent boulders in the vicinity

1. United States Department of the Interior, Bureau of Reclamation, *Annual Project History, Cachuma Unit, Santa Barbara Project, 1948*, Record Group 115, 26.

have Indian drawings carved into them. The natives lived primarily on the bountiful shellfish of the sea, as well as on berries and game taken from the surrounding countryside.[2]

Soon after the Spanish padres arrived, they called for all of the surrounding natives to relocate nearer the mission in Santa Barbara. Many tribes even crossed the Santa Barbara Channel from the Channel Islands. This was done to expedite the church's conversion of the tribes, as well as to keep an eye on them.

Historic Setting

The Santa Barbara area was first settled by Europeans in the late 18th century when the Spanish established the Presidio of Santa Barbara in 1782. The Santa Barbara Mission was founded in 1786. By 1802 the mission was the center of extensive grain fields and fruit orchards (14,000 fruit trees were planted by 1822) and the home ranch for great herds of livestock. As early as 1806 the padres brought irrigation to the area by diverting the waters of nearby Mission Creek into a mill pond for the purpose of grinding grain. In fact, this small dam and reservoir constructed by the padres is still used by the City of Santa Barbara, making it one of the oldest active "reclamation projects" in the country.[3]

Mexican independence in 1821 secularized the mission and brought on a period of neglect that lasted through 1850 when California became a state. Tough times were further prolonged by a drought in the 1860's which resulted in the decline of the cattle industry and the subdivision of the ranches into smaller parcels. As a result, a gradual transition from ranching to farming took place in the area. At first, dry farming techniques yielded such crops as wheat, beans. and alfalfa. But when irrigation was "re-introduced" to the South Coast area in the form of drilled wells and tunnels tapping underground springs such as the Cold Spring Tunnel (1896),

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2. Walter A. Hawley. *The Early Days of Santa Barbara*, (Santa Barbara: Santa Barbara Heritage, 1987), 87.
3. Hawley, 87; Reclamation, *Project History, Cachuma Project, 1950,* 4.

a more wide-ranging, high-value, and intensive form of agriculture took hold in the area. By the turn-of-the-century, the combination of good soil, irrigation, and a dry, mild climate with an average growing season of 333 days (and two harvests per year) allowed Santa Barbara area agricultural to proliferate. New crops included lemons, avocados, walnuts, olives, and lettuce.

As early as 1903 the Santa Ynez River watershed was recognized by the United States Geological Survey's (USGS) Reclamation Service as the only feasible long-term source of a dependable water supply for the increasing population of the South Coast area. The first diversion of water from the Santa Ynez river basin to Santa Barbara took place in 1920 with the construction of the Gibraltar Dam and Reservoir and Mission Tunnel by the City of Santa Barbara. Unfortunately, the city designed this project to meet the needs of a population of only 20,000. Santa Barbara's population was already at that level by the time the project was finished. This project, however, had problems and in 1947 the city found that its original 14,500 acre-foot capacity had been reduced to 7,600 acre-feet by silting.[4]

As the population of the South Coast area continued to increase, its water problems compounded. By the 1940's it was evident that the underground springs were being pumped faster than the rate of natural replenishment. If this continued, it was estimated that 30% of the presently irrigated areas would have to revert to dry farming. In addition, post-war population growth caused the City of Santa Barbara to exceed by at least 1/3 planners' safe annual yield of all its sources.[5] The area simply could not keep pace with consumption. With the onset of yet another dry cycle during this period, the area was forced to ration its water supply and to levy fines if water rationing guidelines were violated (it was not the last time, either). Local water proponents, seeing this as an opportunity, screamed for a new source.

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4. Reclamation, *Project History, Cachuma Project, 1951, 3.*
5. *Ibid*.

Authorization

City- and county-wide studies for a long-term solution to the South Coast area's water problems began in 1938. By 1941 Santa Barbara County had entered into a cost-sharing project with the Bureau of Reclamation to investigate potential solutions. In 1945 the State of California created the Santa Barbara County Water Agency (SBCWA), which would be able to enter into contracts with the federal government, municipalities, and water districts in order to forward the project. The SBCWA/Reclamation partnership originally proposed a "Comprehensive Santa Ynez River Basin Plan - Santa Barbara County" which would also incorporate the Santa Maria Project, a project that neighbored the Cachuma Unit but one that would be shelved until its needs were more pressing (it was ultimately authorized in 1954). A plan including only the Cachuma Unit of the Santa Barbara Project, to service the southern portion of the county was finally authorized by the Secretary of the Interior on March 4, 1948.[6] But since the Santa Barbara populace would be paying for the municipal portion of the project, initial funds could not be released until the project was put to a vote by the citizens of Santa Barbara County.

Over the years there had been much heated discussion of the controversial plan, for Santa Barbara was (and continues to be) an anti-growth-oriented community. Opposition opportunists prior to the 1949 county vote even laughed at Cachuma, tauntingly sneezing its name rather than enunciating it and casting doubts by declaring "that never would enough water flow in the Santa Ynez River to fill Cachuma. It will be a dry lake monument to New Deal-type spending."[7] But when, in 1948, historically water-starved Santa Barbara was once again forced to ration its water supply, opposition quieted. And when Santa Ynez residents downstream of the proposed dam were legally assured that their prior water rights would not be "stolen," the most vehement

6. *Ibid*.
7. "Cachuma Spills!", *Santa Barbara News Press*, 13 April 1958, 1.

opponents to the Project were appeased. It was no surprise, then, that on November 22, 1949, the Cachuma Unit of the Santa Barbara Project won approval by over a three-to-one margin in a Santa Barbara County vote. Following Santa Barbara County voter approval of the plan, Reclamation Commissioner Michael Straus remarked, "This project (Cachuma) is unique. The full cost will be repaid to the Government because it calls for no federal subsidies for flood control or other purposes. It also opens up in California the major field of coastal stream development, making it Reclamation's first Seacoast Project."[8]

The Cachuma Unit of the Santa Barbara Project, as it was originally authorized, was soon renamed the Cachuma Project. The project, with E. R. Crocker as its manager, called for the construction of the 206-foot high earthfill Cachuma Dam with a capacity of 210,000 acre/feet; the Tecolote Tunnel, a 6.4 mile tunnel to carry water from the reservoir through the mountains; and the South Coast Conduit, a pipeline to carry the water from the tunnel exit through the water districts; and, lastly, four regulating reservoirs (the Glen Anne, Lauro, Ortega, and Carpinteria) with local distribution systems serving the Goleta, Summerland, and Carpinteria County Water Districts. The objectives of the project were twofold: the storage of floodwaters of the Santa Ynez River for the purposes of irrigating 20,000 acres of agricultural lands (with a planned expansion to 38,000 acres by 1981); and to supply the growing industrial and municipal elements of the South Coast area, from Goleta in the west (where University of California-Santa Barbara located in 1958), through Santa Barbara proper, to easternmost Carpinteria.

The Cachuma Project, exclusive of the Cachuma Dam and its distribution systems, is operated by each local member district and its maintenance board. Reclamation relinquished these duties in 1962, by which time sufficient operating criteria had been recorded.

8. Reclamation, *Project History, Cachuma Project, 1951,* 4; "Cachuma Approved," *Santa Barbara News-Press,* 23 November 1949, 1.

Construction History

Bids to construct the primary features of the Cachuma Project - the Bradbury Dam and Cachuma Reservoir, Tecolote Tunnel, and the South Coast Conduit - were all filled by early 1950, with the Tecolote Tunnel commencing construction first in March of that year. Awarded the $4.75 million tunnel contract was Carl M. Halverson, Inc., of Portland, Oregon, and H. Halverson, Inc, of Spokane, Washington. Responsibility for construction of the $6.7 million dam was awarded to Mittry Constructors of Los Angeles. The American Pipe and Construction Company, also from Los Angeles, built the South Coast Conduit for $1.58 million.[9]

Although relatively short in length, at 6.4 miles, the Tecolote Tunnel proved to be one of the most difficult tunnel jobs undertaken in its era. Among obstacles faced by Halverson work crews were inflows of underground water streams that reached 9,000 gallons per minute (gpm), heat up to 117 degrees (F), dangerous accumulations of methane gas, and long reaches of rock that swelled and squeezed beam supports. Setbacks hospitalized mine workers, delayed the project, increased costs, and ultimately forced a change in contractors.

The first of these problems was encountered in January, 1951. Halverson workers had advanced excavation from the outlet portal of the tunnel 7500 feet without incident, averaging 870 linear feet per month, when an explosion of methane sent eleven miners to the hospital for treatment. None was seriously injured. Earlier the same day a hole had struck an oozing mixture of water, sand, and gas. A well was drilled to relieve the area of the gases.[10]

Work was also interrupted at least three times in the next three months at the outflow portal where large inflows of water were encountered of 300-500 lbs/psi pressure. When such flows occurred, workers constructed concrete bulkheads to work behind while grouting off the

9. Reclamation, *Project History, Cachuma Project, 1950*, 34.
10. *Ibid*., 43.

seepage. This was usually only partially successful, with discharges ultimately increasing, forcing additional grouting and delays in forging the heading forward. In August tunnel miners encountered major flows up to 1870 gpm and attempted to install a pumping mechanism to rid the tunnel of the water. It did not help against such volume so they were forced to construct concrete bulkheads again. Grouting, too, proved to be difficult because the rock that the cement bonded to was too soft and thus insufficiently strong to withstand such pressure. This slow and cumbersome procedure was employed repeatedly, slowing advancement of the tunnel heading to a crawl.[11]

In August, 1952, Halverson attempted to divert flows of 1000 gpm in the outlet area by driving drainage drafts beside both sides of the tunnel at a 45 degree angle away from the tunnel line for 38 feet then advancing the draft parallel to the line. In doing so, they were able to slowly advance.[12]

By March, 1953, the tunnel lied up to 2400 feet below the coast range crest. Here, they first encountered stifling heat. Water inflows were 106 degrees and discharging at a rate of 3600 gpm, the air temperature stood at 96 degrees, and the humidity, 100%.To make matters even worse, several hundred yards of shale were sluiced into the tunnel along with the massive outflow of water. Grouting in this area was not successful, for they had little room to work in their 7-foot horseshoe tunnel. By June it was 112 degrees in the tunnel and Halverson, Inc. put in claims for increased costs due to the unsafe and difficult work conditions. On July 21, with 4700 feet to go, Halverson suspended tunneling operations for the year.[13]

Many meetings were held at this juncture to work out objections. Project engineer John

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11. *Ibid.*, 44.
12. *Ibid*.
13. Reclamation, *Project History, Cachuma Project, 1954*, 20.

L. Perko appointed a special consulting board for recommending possible amendments to the prior working environment. Work orders were, in fact, modified twice but Halverson continued to object. In January, 1954, Halverson finally negotiated to subcontract the remainder of tunnel work to Coker Construction Company and Peter Kiewit & Sons. Contract changes were made to substantially increase payments for tunnel excavation to compensate for the nearly impossible work conditions encountered.[14]

During its first three months, the Coker/Kiewit partnership rehabbed the tunnel, installed new discharge and ventilation lines and new power cables, overhauled trackage, and placed new blowers into position. Tunnel mining resumed on April 12 with the installation of four Turbinair motors for power for pumping, as well as for cooler air and ventilation - ventilation and overheating being serious problems once more as temperatures rose to 117 degrees at the tunnel heading with 100% humidity. Miners rode into the tunnel in muck cars filled with tepid water, sitting submerged up to their chins to keep their body temperatures from reaching dangerous levels. The tunnel miners were able to continue working by crawling back into the water cars intermittently to cool off. In spite of water that reached a maximum flow of 9000 gpm, the heading was steadily advanced. One of the toughest tunnel drilling jobs of its time had been accomplished when by January, 1955, water inflows had dropped to 6400 gpm and 76 degrees, allowing the tunnel to be finally holed through on January 15, 1955.[15]

Upon completion of lining of the tunnel and the placement of chlorination equipment (for the municipal water supply) in January, 1956, this most integral feature of the Cachuma Project had escalated in cost from $5 million to $14.5 million.[16] The Tecolote Tunnel held the dubious

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14. Reclamation, *Project History, Cachuma Project, 1956*, 8.
15. *Ibid*., p.9; "Cachuma Spills!" *Santa Barbara News-Press*, 13 April 1958, 3.
16. *Ibid*., 15.

distinction of being the first element of the project to begin construction and the last to finish.

Construction of the Bradbury Dam and South Coast Conduit posed no problems anywhere near the scale of the Tecolote Tunnel's, although innovative features were incorporated into the design of the dam which Mittry Constructors commenced building in August, 1950.[17]

Due to economic constraints imposed on the project during the planning phase by Santa Barbara County, design engineers at Reclamation were forced to investigate construction alternatives that might reduce costs. Design engineer Harold Arthur's solution was a design first for Reclamation. Normal earthen dam construction procedure at the time included drilling a big, expensive 25-foot diameter diversion tunnel and putting in coffer dams to divert the river flow in order to then dig into the foundation and build the dam "in the dry." Southern California's dry season, though, allowed for changes in this regimen which could make the project more affordable. Instead, Arthur design plans envisioned a much smaller, temporary diversion tunnel of about 7 feet in diameter, the minimum-sized space it was considered a man could work in. A tunnel this size would be sufficient to divert the minimal summer flowage of the Santa Ynez River, during which time crew could dig the foundation. When the winter rainy season came and flows increased, crews would fill the hole back up to river level, take down the coffer dam, and let the river flow over the foundation. The next season Arthur's plan called for rebuilding the coffer dam and beginning construction of the dam embankment to a point high enough to control the subsequent wet season's flow behind it. The next season the dam would be finished. Since the price for Arthur's plan was "appreciably less" than prior designs it was given approval and incorporated into the dam construction process by Mittry.[18]

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17. Reclamation, *Project History, Cachuma Project, 1951*, 5.
18. Arthur, Harold G. Interview by Brit Allan Storey, January 11, 1995 (Tape 1). Bureau of Reclamation, Denver, Colorado.

When finished, the Bradbury Dam was a zoned earthfill structure that rose 206 feet above the stream bed with a crest length of 2975 feet. 6,695,000 cu/yds of earthfill were used in its construction. The spillway section is concrete-lined, with four 50x30 foot radial gates, and has a capacity of 161,000 cf/s. Beneath the dam is a 7-foot horseshoe tunnel containing the controlled outlet works, which consist of the concrete-lined tunnel through which two 30-inch, hollow-jet valves and one 10-inch butterfly valve pass non-flood flows of the river to users downstream of the dam; it was this constituency that had been the most vocal opponents of the project from the outset, having feared that their long-standing prior water rights would be "stolen" by the Bradbury Dam. This special outlet works apparatus allowed for the protection and recognition of their water rights by continuing the uninterrupted delivery of Santa Ynez water.[19]

The Cachuma Reservoir formed by the dam has a normal capacity of 205,000 ac/ft, covers 3250 acres when full and has a shoreline covering 42 miles.

The South Coast Conduit was the conveyor of Santa Ynez River water from the Tecolote Tunnel through the South Coast water districts. The job of constructing this conveyance was the American Pipe and Construction Company's (AP&C). AP&C began laying the 26-mile, 48-inch diameter, high-pressure reinforced concrete pipeline in June, 1950, from the outlet portal of the Tecolote Tunnel above Goleta, the westernmost area subscribing to the project. The conduit ultimately stretched from this point, across the steep canyons, rolling hills, and highly-developed residential and estate areas of the South Coast, to the Carpinteria Regulating Reservoir in the heart of the Carpinteria County Water District's service area. The 10-mile section of the Goleta reach was the first to be finished, extending from the Tecolote Tunnel portal to the Lauro Regulating Reservoir site. The 16-mile Carpinteria section, completing the conduit, included 36-,

19. Reclamation, *Project History, Cachuma Project, 1956*, 7.

30-, and 27-inch pipeline and terminated at the Carpinteria Reservoir.[20]

The Sheffield Tunnel section of the South Coast Conduit was bored through a high ridge within the city limits of Santa Barbara. It is 6-feet in diameter, with the conduit itself, 30-inches in diameter at this point, being laid through this 6,000 foot tunnel. All facets of the South Coast Conduit were finished by AP&C by 1956.[21]

The Lauro (Santa Barbara), Ortega (Summerland), and Carpinteria Regulating Reservoirs constructed along and integrated with the South Coast Conduit were so located in order to gravitate or "float along the line." Automatic pressure valves controlled the reservoirs' storage so that they supplied additional water during periods of peak demand. The fourth regulating reservoir, the Glen Anne, was located below the outlet portal of the Tecolote Tunnel and serves as overflow storage for the conduit, receiving its water supply by gravity from an outlet near the head of the South Coast Conduit. These regulating reservoirs' varied in capacity: Carpinteria - 40 a-f; Lauro - 640 a-f; Ortega - 60 a-f; and Glen Anne - 470 a-f.[22]

The last phase of the Cachuma Project included three separate, localized water distribution systems constructed by Reclamation for direct delivery to Goleta, Carpinteria, and Summerland County Water District consumers. In these primarily agricultural areas, the landscape called for small pumping plants to serve lateral pipelines. In the case of Carpinteria, a 50,000 gallon elevated water tank ensured delivery to more difficult-to-reach areas. These systems were all operable by early 1956.

So desperate for Cachuma's water were the cities of Santa Barbara and Montecito as early as Summer, 1951, that they, in fact, could not wait any longer. Due to yet another drought, their

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20. *Ibid*., 12.
21. *Ibid*, p.13.
22. Water and Power Resources Service, *Project Data*, (Denver: Government Printing Office, 1981), 103-4; Reclamation, *Project History, Cachuma Project, 1956*, 12.

old municipal reservoirs were literally down to "fire storage," so the SBCWA regional director entered into a contract to use seepage water being discharged at the Tecolote Tunnel. By July, 1951, emergency water was being delivered to the thirsty communities through a 7500-foot-long, 12-inch-wide pipe installed in the tunnel to take the valuable seepage to Lauro Canyon where it was then taken by the requesting districts.[23]

"Cachuma Spills!" read the enthusiastic headlines of the local *Santa Barbara News-Press* on April 13, 1958, as Lake Cachuma finally filled to the brim, signifying to the thirsty South Coast population that the construction of the long-awaited project had come to a successful close. Now residents could reap the anticipated benefits of a long-term, dependable supply of water. As another local observer wrote in the same day's *News-Press*, "As Cachuma's water rose toward the spilling point during recent weeks, the long-range value of every piece of real estate in the Santa Ynez Valley and along the South Coast rose, too."

Post-Construction History

The completion of the Cachuma Project supposedly signaled the end to the South Coast area's long history of water woes. As long as Lake Cachuma, with its 205,000 ac/ft capacity, held the perennial floodwaters of the Santa Ynez River that would have otherwise "wasted to the sea," both the farmers and the populace of the region received the water supply that would satisfy their present needs and make all of their future plans possible.

The Cachuma Project's post-construction history is one of operating and maintaining the water system that ensured the county's economic well-being. If a slight tremor was felt in Santa Barbara, or a deluge rained upon Goleta, or smoke from a distant wildfire was observed in Montecito, many a person's minds would turn to their county's critical body of water sitting back

23. Reclamation, *Project History, Cachuma Project, 1952*, 3.

in the deep folds and craggy rock of the Santa Ynez River Valley - Lake Cachuma - and wonder if that same earthquake, rainstorm, or wildfire had had any ill effects on it.

Minor natural disasters did visit the South Coast area from time to time but failed to do much if any damage to project works. More often than not it was the region's aridity rather than deluges of rain that beset the SBCWA, for the agency discovered early in its data gathering period that they were losing an estimated 16,000 ac-ft of water to evaporation annually. Lake Cachuma was so characteristic of dry climate reservoir sites having the same problem that in 1960 an University of Nevada experimental team selected the lake's surface as its test site for the application of a potential anti-evaporation coating consisting of a variety of chemical sprays. As to the results of this questionable experiment, a Cachuma Project history writes only that "experts considered the experiment successful, with considerable data developed."[24] Notwithstanding the above attempt, evaporation problems continued to beset Lake Cachuma.

Since the Cachuma project works were located in Southern California, the seismicity of the area had to be taken into account. Much testing was done prior to construction to ensure the feasibility of locating the project in a region subject to tremors which could register up to 6 or 7 on the Richter scale. Each dam included in Cachuma, except for Lauro (Santa Barbara), was located at least one mile from known faults and was conservatively designed to withstand quakes of at least a 6. Quakes of a 7 or above were planned to be a possibility, with attendant damage a possibility, but extra liquefaction susceptibility tests concluded such construction to be safe. Cachuma Project dams did, in fact, successfully withstand a 6.4 quake whose epicenter was fifteen miles away in 1971. Even so, the 1980's and '90's brought with them improved seismic technology which Reclamation's Division of Dam and Structural Safety put to use, particularly

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24. Reclamation, *Project History, Cachuma Project, 1961*, x.

on the agency-built dams of Southern California. When the potential of seismic-induced liquefaction of Bradbury's downstream face material was identified in the early 1990's, the reservoir's storage capacity was reduced until the problem was corrected by constructing a series of dewatering wells to dry the downstream face shell material in question. The dam is now graded satisfactorily.[25]

Landslides also occurred in the vicinity of the South Coast Conduit downstream of Ortega Dam in 1975. These slides temporarily jeopardized the conduit but steel piles with support saddles were installed making the situation safe and preventing distribution shutdown.[26]

Wildfires sparked by the hot, dry Santa Ynez summers are common in the area, with one burning over 200 acres above Lake Cachuma in 1980. The fire was extinguished before it could endanger any project works. The area was then reseeded to prevent future mudslides.[27]

The same arid, barren landscape that was so susceptible to natural disaster also lent itself to a another problem causing particular frustration among dam managers in the region - that of sedimentation. The chaparral flora, rainstorms, landslides, and wildfires all resulted in prodigious amounts of silt washing into Lake Cachuma and backing up behind Bradford Dam. Managers have tried a series of mitigating measures, none of which has made much of a dent in silt build-up. Managers are left pondering ways to combat a process that has robbed Cachuma of an estimated ten percent of its capacity.

On the curious side, when the project first made its water supply available, customers on the eastern side of Santa Barbara County reported taste and odor problems in their water. While tests could not confirm the presence of anything harmful, an extensive flushing of the South

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25. Bureau of Reclamation, Division of Dams and Structural Safety, *SEED Report on Bradbury Dam,* (Denver, 1985), 4.
26. Reclamation, *Project History, Cachuma Project, 1975*, 2
27. *Ibid*.

Coast Conduit in 1961 seemed to solve the problem. There were no additional complaints.[28]

Lake Cachuma became a very popular recreation destination, with the 3,250-acre, 42-mile shorelined reservoir being the site of fishing, boating, camping and other activities. In 1980, the Cachuma recreation area, administered by the Santa Barbara County Parks Department, registered over one million visitors.[29]

By 1990, the Santa Ynez River's historic pattern of high variability had begun to frustrate area water managers. Drought cycles in the South Coast area drew the reservoir level down from time to time, but since the Cachuma Project was planned to weather a seven-year drought, and wet cycles always seemed to return to replenish water sources before a deficiency became pressing, such fluctuations only unnerved the planners at the SBCWA. In 1979, the SBCWA went as far as to attempt to augment the county's water supply by contracting for 57,500 ac-ft of water from the State Water Project. They planned to share in the construction costs to bring the supply to the South Coast area but residents overwhelmingly refused to approve bonds to finance the venture, which included an 83-mile long canal connecting the county to the state project. The area's propensity to oppose any inkling of growth manifested itself again by sending a message of "no water, no unwanted development, no growth."[30]

Because of this mindset, the South Coast area, famous for its Spanish architecture and lush gardens and lawns, also had one of the state's slower growth rates. By the mid-1980's, though, the area was in the midst of a drought which did not loosen its grip on the region for seven years. The drought eventually dried up the City of Santa Barbara's Gibraltar Reservoir, which ordinarily supplied thirty percent of municipal water supply, while also draining Lake

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28. Reclamation, *Project History, Cachuma Project, 1963*, 4.
29. *Project Data Book*, 101.
30. Hundley, Norris. *The Great Thirst: Californians and Their Water, 1770's-1990's*. (Berkeley: University of California Press, 1992), p.400.

Cachuma, which provided most of the balance needed by the city and county, down to 20% of total capacity, its lowest level ever. In 1989, the District was forced to install an emergency pumping plant to move what little water was present through the reservoir's outflow tunnel. The plant ended up being employed for two years.[31]

During this time, anxious officials in Santa Barbara and nearby communities hurriedly adopted mandatory conservation measures, some of them quite stringent: banning lawn watering and prohibiting all but the use of hand-held buckets or drip irrigation systems to keep trees and shrubs alive; increasing water rates (rates had averaged about $18 per family; now they would be nearly $76 per month); stepping up groundwater pumping; and even exploring the possibility of bringing in Canadian water by barge and temporarily transporting state water from the Central Valley through a never-used oil pipeline.[32] As the crisis deepened, Santa Barbara approved plans to build an emergency desalination plant and again pondered tying the South Coast area permanently into the State Water Project - a proposal rejected by voters in 1979. The need became so critical by June, 1991, that a special county vote overwhelmingly approved tapping into the State Water Project, with an additional advisory component of the election recommending turning the proposed emergency desalination plant into a permanent facility. "I think voters realized that our local water resources are wholly inadequate to sustain our economy and our quality of life," commented one supporter. "We need a variety of water sources to rely on."[33]

Ironically, after the heavy winter rains of 1994-95, Lake Cachuma was filled to the brim again, the desalination plant was online, and the initial delivery of water from the State Water

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31. *Ibid*., p.401.
32. "Santa Barbara in a Frantic Quest for Water," *Los Angeles Times*, 11 April 1990, 1.
33. "Santa Barbara to Tap State Water," *Los Angeles Times*, 6 June 1991, A25.

project was soon to arrive. There was even talk of selling surplus water to the farmers and residents of nearby Santa Maria Valley.

Settlement of the Project

The Santa Ynez River Basin area was already substantially settled prior to the mid-1950's when the Cachuma Project was finished. The objectives of the project were to provide the area's established agricultural and municipal interests with a reliable water supply, not to spur settlement of the area. Although it was initially thought that the project might double the amount of irrigated land within the water district, urban growth has taken place more than anything else, encroaching on formerly agricultural lands. In fact, the total acreage irrigated by the project has stayed relatively flat since the mid-1970's, fluctuating from 10,000 to 12,000 acres annually. The presence of the project did supposedly solidify the economic future of the South Coast area, however the large anti-growth elements were quick to make sure it did not mean unlimited growth. Consequently, the Cachuma Project did not alter development patterns of the area as much as it ensured agricultural interests that they would have a more dependable supply than just underground springs, while also providing Santa Barbara County's urban environs with the means by which they could hopefully sustain their present and future quality of life.

Uses of Project Water

Bradbury Dam's primary function is to store floodwaters of the Santa Ynez River in order to provide a supplemental supply of irrigation water to the approximately 12,000 acres of land (1990) on which is grown primarily citrus and other fruits, lettuce, tomatoes, and alfalfa; to supply municipal water to approximately 150,000 individual users in the City of Santa Barbara and other urban areas such as Goleta, Montecito, and Carpinteria located in Santa Barbara County on the southern slope of the Santa Ynez Mountains; and to hold back up to 205,000 ac/ft to be used for recreational purposes on the 3,250-acre Lake Cachuma reservoir.

In 1990 the Cachuma Project's years of producing high-value crops gave it membership in Reclamation's "Billionaire's Club," making it one of nineteen reclamation projects nationwide - and next to the neighboring Santa Maria Project, the youngest - that have accumulated over one billion dollars worth of gross crop receipts over the life of the project.[34]

Conclusion

"Every man, woman, and child living on the land to be served by Cachuma will benefit because a mammoth dam and reservoir stood ready to collect the priceless rains of the season," exclaimed the *Santa Barbara News-Press* on April 13, 1958. Apparently somebody forgot to tell Mother Nature to comply, for the "priceless rains" did not always fall. As a result, the Cachuma Project, though successful in its own right, stands as yet another illustration of Southern California's long-standing, problematic quest to solve its water needs. The Reclamation/ SBCWA partnership's dependence on a wildly fluctuating, intermittent stream such as the Santa Ynez has left them in a quandary since the project was built to store the river's floodwaters - floodwaters that because of the vagaries of California's climate may or may not occur. Although planned to deal with droughts up to seven-years long, the area's last prolonged dry period nearly brought the Cachuma Project to its knees, forcing the county water authority to realize that if it was to furnish its district with a reliable water supply, it would have to look to means other than just Cachuma.

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