

A Water District of Our Own

A Celebration of Alameda
County Water District's
First 100 Years



ACWD
ALAMEDA COUNTY WATER DISTRICT

A Water District of Our Own

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Foreword

by Walter L. Wadlow, ACWD General Manager, 2009-2014

Centennials are milestones – opportunities to reflect on where we’ve come from and where we are going.

In the case of Alameda County Water District’s centennial, it is that and more. As is the case throughout California and the western United States, our ability to live, work, attend school, and play depends on a reliable supply of high-quality water at a reasonable price. In the arid West, this doesn’t “just happen.” On the contrary, the water supply for the cities of Fremont, Newark, and Union City is a result of 100 years of foresight and investment by local residents, businesses, public agencies, and leaders. It’s their work we can look to for ensuring the water we sometimes take for granted.



Alameda County Water District’s ability to reliably provide supplies of high-quality water has played, and will continue to play, a foundational role in the daily lives of all who live and work in the Tri-Cities. The District was formed in 1914 amidst an intense struggle for control of local water sources. As this book describes, we had to compete with other entities for water to support southern Alameda County agriculture. After World War II, the District’s challenge became fulfilling the water needs created by our area’s rapid residential, commercial, and industrial development. This struggle for water is key to understanding who we are today as a community.

The present-day challenges of providing water are even more complex. As this book goes to print, California is grappling with a continuing drought of historic proportions. As the state’s population continues to grow, and as the negative impacts of climate change are increasingly felt, we will be faced with difficult decisions about ensuring reliable water for people and the environment. It is critical that community members increase awareness and understanding of water issues so that the Tri-Cities can sustainably grow for our children and grandchildren. At the District, we believe that a shared understanding of our area’s water history provides the basis for selecting local leaders who can successfully confront these challenges.

We celebrate our diverse community, which includes families with a long history in the Tri-City area as well as those who have come here from other parts of the country and from around the world. It is my hope – and the District’s – that this book will contribute to a shared sense of history and understanding of water’s critical role in the development of our community.

It is in this spirit that we offer a glimpse into the first 100 years of water from the Alameda County Water District, “A Water District of Our Own.”



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Alameda Creek near Coyote Hills at dusk

Chapter 1 • Agriculture, Alameda Creek, and Activism

How the people of Washington Township fought powerful interests in San Francisco and the East Bay and won control of their own water

When Washington Township's early residents arrived in the mid-1800s, water was abundant in Southern Alameda County from free-flowing streams and groundwater so close to the surface that even shallow wells would bring in water.

This bode well for the farmers who settled there. They used the water to raise crops such as potatoes, beans, berries, and peas, for these were much in demand during the Gold Rush in the Mother Lode country. Yet only two decades after gold was discovered, the Pony Express had come and gone, Californians had elected their tenth governor, and the gold-seekers had either moved on or made new livelihoods from the fertile soils of Northern California.

Responding to new markets, Washington Township farmers made big changes in what they grew. They planted wheat, barley, and oats. Some residents turned to cattle ranching and dairy farming, and others planted apricot, cherry, pear, and plum orchards. By the end of the nineteenth century, vineyards and wineries were part of the mix. Although the population had grown, the shifts in agriculture had the most significant impact on water use in the area.

But Washington Township farmers were not alone in their interest in Southern Alameda County water. San Francisco was growing and its sources of water would not be adequate for that city's burgeoning population. An engineering survey identified Calaveras Creek, a tributary of Alameda Creek, as an excellent source. Spring Valley Water Works, a private water company, purchased a reservoir site for a future dam there.

Washington Township's economic base was agriculture, primarily grains, vegetables, and other crops. The Alvernaz family, photographed in 1918, grew onions on their Centerville farm.



The water company also purchased riparian rights along the banks of Alameda Creek. The farmers who held these rights sold them relatively cheaply rather than engage in lengthy and expensive court battles with the private water company. In the late 1880s, Spring Valley laid pipes under San Francisco Bay and pumped Washington Township water to the San Mateo peninsula, and from there to San Francisco.

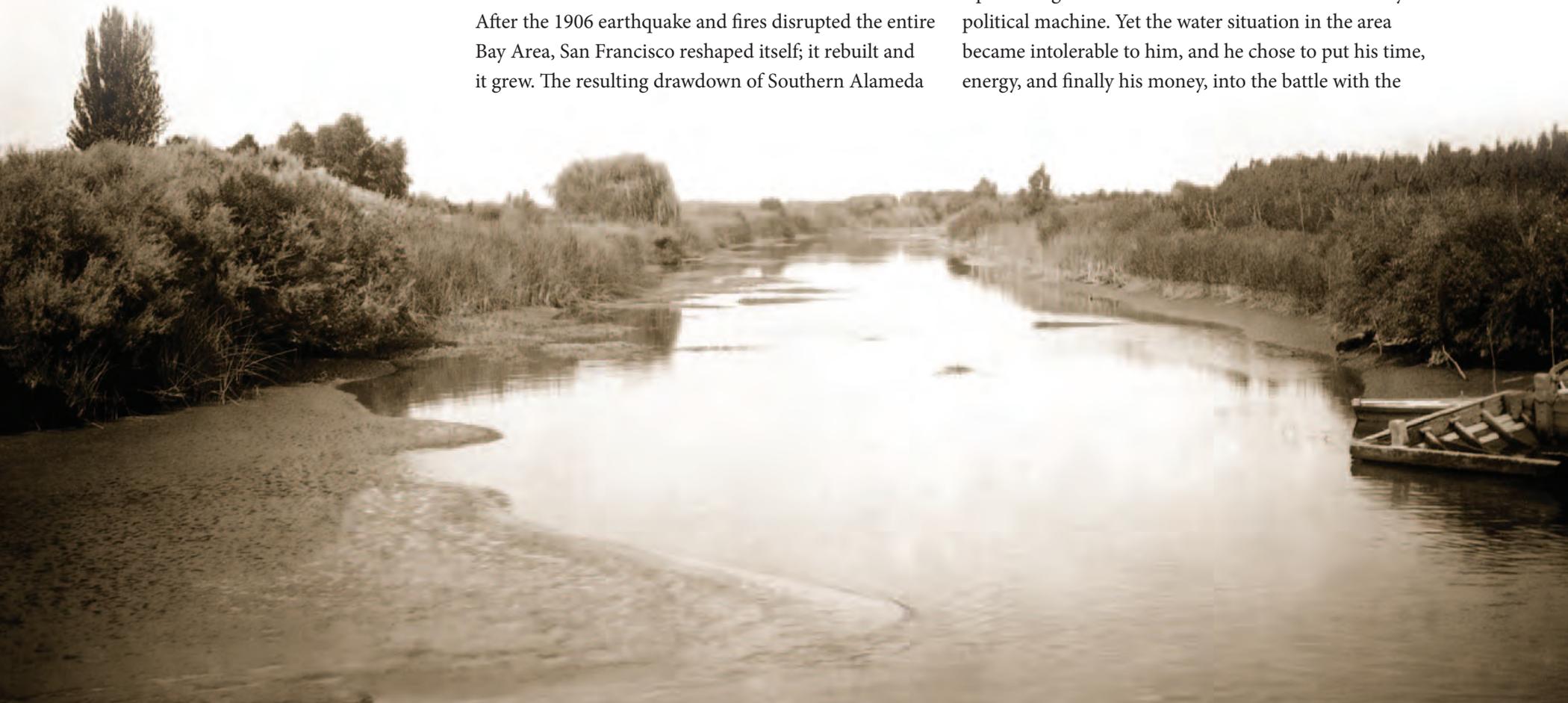
At the same time, another private water company, People's Water Company, began pumping water from artesian wells in the Alvarado area to their customers in Oakland.

After the 1906 earthquake and fires disrupted the entire Bay Area, San Francisco reshaped itself; it rebuilt and it grew. The resulting drawdown of Southern Alameda

County water was enormous. In 1911, 16 million gallons a day were going to San Francisco and another 6 million gallons a day were going to Oakland. Water was taken without any effort to replace the resource or protect the aquifers. Local farmers needed to irrigate their fields. But with the drawdown, residents' wells went dry, orchard trees weren't getting previously available groundwater, and there wasn't enough water for irrigation.

In 1910, Decoto (Union City) educator Christian Runckel began urging the people of Washington Township to regain control of their water. Runckel had a promising career ahead of him thanks to the county political machine. Yet the water situation in the area became intolerable to him, and he chose to put his time, energy, and finally his money, into the battle with the

The mouth of Calaveras Creek at the turn of the century





giant water companies. “As time proceeded,” he said, “the promise to make money seemed to unravel itself to me.”

Seeing the private water monopolies gaining more and more control, Runckel decided “to fight for the agricultural redemption of the fertile farming section.” His weapon in this battle was the *Washington Press*. Runckel was its editor.



Christian Runckel

In August 1911, Runckel published a scathing editorial in the *Washington Press*. Calling attention to the amount of water being taken by outside private companies, he demanded that these entities go to the Sierra Nevada for their water so that “the water now being diverted therefrom, shall be restored to the people of Alameda County.”

The 1906 earthquake greatly affected water use throughout the Bay Area. Many earthquake refugees fled to Oakland, creating increased demand on that area's water supplies. San Francisco not only rebuilt swiftly, its population swelled. It wanted to show off its recovery, and invited “the world” to the Panama Pacific International Exposition in 1915, spurring additional growth. All these earthquake after-effects put a strain on Washington Township's water, because it was being pumped to Oakland and San Francisco.

Washington Township farmers needed water from streams and wells to irrigate their fields, but with the massive drawdown from pumping and diversions, their wells were going dry.

A township meeting was announced for October to rally support for San Francisco's appeal for Congressional approval of the Hetch Hetchy Dam project. If San Francisco got Hetch Hetchy, Runckel reasoned, it wouldn't need Alameda Creek. Yet as residents rallied, the drawdowns continued. A third private water firm suddenly appeared on the scene. Bay City Water Company acquired 2,200 acres in the Newark area and was sinking a well, presenting the threat of more exports of Washington Township water.

In May 1912 residents held another mass meeting and created the Washington Township Water Committee. But there was only so much a committee could do. By the end of 1912 the City of Oakland was planning to create its own water district, which would include northern Alameda County and a narrow strip running down the coast to incorporate the Alvarado wells of the People's Water Company.



In March 1913, Washington Press editor Christian Runckel called for the people of Washington Township to create "A Water District of Our Own."

There were more meetings, more editorials, more activism. However, the stark truth was that Washington Township could not have “A Water District of Our Own,” as Christian Runckel called for in the paper, because only incorporated cities had the right to form public water agencies. Meanwhile, 1912 had been a dry year and by early 1913, the water table had reached its lowest level in history, with water levels falling an inch a day.

ACWD's history illustrates the power that resides in local American communities to conduct their own affairs and to protect their own interests. Its story is distinctly American – in which the “little guy” ultimately triumphs over more powerful vested interests by grit, determination, and political savvy.

Pressure for more water kept growing. Spring Valley Water Company was rushing to complete a dam on Calaveras Creek. San Francisco wanted to show off its earthquake recovery to the world and would be hosting the Panama-Pacific Exposition in 1915, creating an increased water demand.

Washington Township's Water Committee began lobbying state legislators to revive and pass a previously unsuccessful bill by Senator Anthony Caminetti to establish water districts in unincorporated areas of counties. Their efforts paid off in June 1913 when the Caminetti bill – the County Water District Act – was passed.

the technical objections by the end of the year. An election was set for December 30, 1913.

That day, 883 residents voted in favor of forming a water district. Only 18 voted against it.

Alameda County Water District became the first water district in the state to be created under the County Water District Act. It opened the way for other counties to protect and preserve their water as well. Today there are several hundred county water districts in California.

Washington Township wasted no time. It presented a petition to organize a water district to the Alameda County Board of Supervisors in September 1913. There was enormous opposition from large firms such as Morgan Oyster Company, Southern Pacific, Continental Salt, and the People's Water Company. Other companies demanded to be excluded from the district. Water Committee representatives pressed on, negotiated, and resolved all

After the votes of the December 30, 1913, election were counted, the local newspaper declared a “smashing victory” when 98 percent of voters supported creating the Alameda County Water District.



ACWD's First Board of Directors

On May 11, 1914, five newly elected board members convened the first meeting of the Alameda County Water District (ACWD). Reflecting the population of Washington Township in southern Alameda County, counted among the five were nurserymen, orchardists, ranchers, and farmers. Some of them represented families that had been in Washington Township since the Anglo settlement of the area in the mid-1800s.



JOSEPH C. SHINN, *President*

Shinn's family had established the first nursery in the area. He lived near Niles and had large properties bordering Alameda Creek.



WILLIAM TRENOUTH

Trenouth, a fruit-grower, owned orchards near Irvington, the heart of Washington Township.



E.H. STEVENSON, *Vice-President*

Stevenson's property lay near Centerville, where he grew grain, sugar beets, and some fruit.



EMMANUEL GEORGE

Also primarily an orchardist, George lived at the southern end of the District, near Alviso School.



WILLIAM PATTERSON

The youngest board member was William Patterson, whose 3,000-acre ranch lay north of Newark.

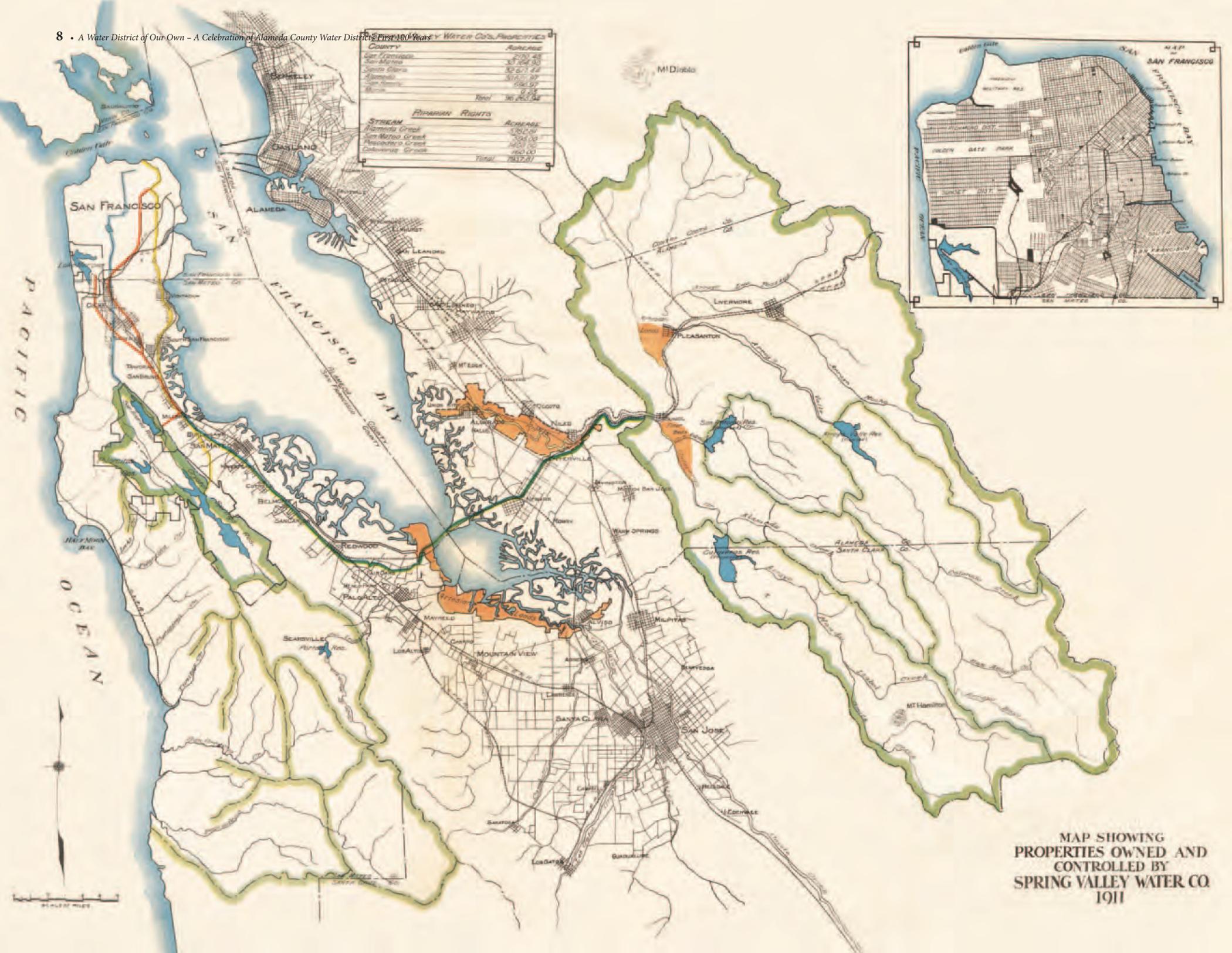
Free-flowing streams brought abundant water to the peoples of Southern Alameda County, first the Ohlone People and later, Spanish colonizers. Mexico claimed the area in 1821, and carved it into ranchos. After the 1840s, the area was farmed by people who came from throughout the United States and

beyond. They called the area Washington Township, and it encompassed the villages of Irvington, Centerville, Mission San Jose, Warm Springs, Niles, Decoto, Newark, and Alvarado. From Washington Township emerged today's cities of Fremont, Newark, and Union City.

Alameda County Map, 1878. Washington Township is shown in green.



SPRING VALLEY WATER CO. PROPERTIES	
CITIES	
San Francisco	37,224.50
San Mateo	32,677.44
Santa Clara	3,157.97
Alameda	5,157.97
Mountain View	1,157.97
San Jose	1,157.97
Total	79,453.84
RIPARIAN RIGHTS	
STREAM	
Alameda Creek	3,200.00
San Mateo Creek	2,000.00
Piedra's Creek	2,000.00
Colvins Creek	1,600.00
Total	8,800.00



MAP SHOWING
 PROPERTIES OWNED AND
 CONTROLLED BY
 SPRING VALLEY WATER CO
 1911

Chapter 2 • Litigation and Protest

The district used every means available to secure and protect water rights in Washington Township

ACWD began its existence embroiled in controversy as soon as Washington Township residents voted “yes” and created their own water district in 1913. Opponents challenged the validity of the election, the constitutionality of the County Water District Act, and the District’s right to levy fees and litigate on behalf of its ratepayers. Even though opponents included private water monopolies and big companies, the District didn’t back down. Directors weren’t just fighting for water, they were fighting for their community.

Spring Valley Water Company, which by ACWD’s founding, owned water rights up and down Alameda Creek, began building Calaveras Dam in the upper watershed. The City of San Francisco, which Spring Valley supplied, wanted a high-capacity reservoir. Washington Township feared Spring Valley would dam up all the water from Calaveras Creek. Water would still flow into the creek from runoff and other sources, but there was a bigger issue – the Niles Cone groundwater basin underlying the newly formed water district. Spring Valley denied that there were deeper layers in the aquifer and would not provide water to recharge the Niles Cone.

The first order of business for the District was to be able to back up claims about the Niles Cone. General Manager/

Engineer Cyril Williams set up monitoring on more than 600 wells and was able to determine a correlation between stream flows and changes in groundwater levels in the aquifers. The District then sued Spring Valley Water Company to protect the Niles Cone.

Eventually, the State Water Commission stepped in. They conducted more studies to determine if and how Spring Valley could store additional surface water and divert it to San Francisco without further depleting the Niles Cone. It took them five years to complete their research and reports.

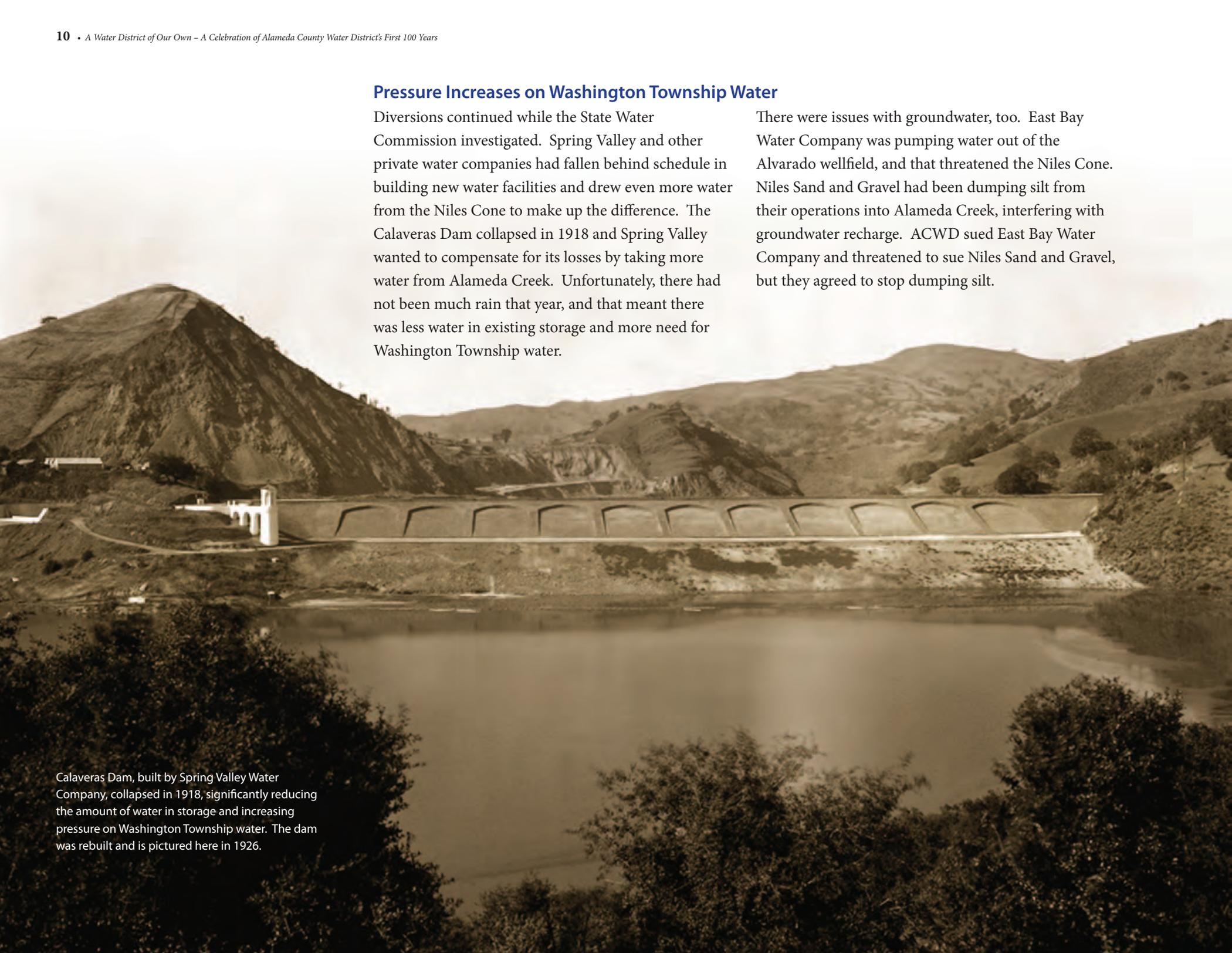
San Francisco Mayor James “Sunny Jim” Rolph, Jr. presided over the 1930 celebration commemorating San Francisco’s purchase of the entire Spring Valley system, marking a new era of water management affecting Washington Township and the entire Bay Area. Rolph would eventually become California’s governor and Washington Township would eventually get back its water rights.



Pressure Increases on Washington Township Water

Diversions continued while the State Water Commission investigated. Spring Valley and other private water companies had fallen behind schedule in building new water facilities and drew even more water from the Niles Cone to make up the difference. The Calaveras Dam collapsed in 1918 and Spring Valley wanted to compensate for its losses by taking more water from Alameda Creek. Unfortunately, there had not been much rain that year, and that meant there was less water in existing storage and more need for Washington Township water.

There were issues with groundwater, too. East Bay Water Company was pumping water out of the Alvarado wellfield, and that threatened the Niles Cone. Niles Sand and Gravel had been dumping silt from their operations into Alameda Creek, interfering with groundwater recharge. ACWD sued East Bay Water Company and threatened to sue Niles Sand and Gravel, but they agreed to stop dumping silt.



Calaveras Dam, built by Spring Valley Water Company, collapsed in 1918, significantly reducing the amount of water in storage and increasing pressure on Washington Township water. The dam was rebuilt and is pictured here in 1926.

Where Does the Water Come From?

Below Fremont, Newark, Union City, and a portion of southern Hayward is a complex underground water system called the Niles Cone Groundwater Basin (Niles Cone). It covers about 100 square miles and is made up of four distinct aquifers. An aquifer is not the water, but rather a geologic formation of sand and gravel in which water is stored and transmitted.

Water percolates into the Niles Cone through the gravel beds in Alameda Creek. ACWD has worked to protect this basin since Day One, and as this chapter shows, the District initially pressured the private water companies to release enough water back to the creek to recharge the Niles Cone. Today the District uses two inflatable dams along

Alameda Creek to slow down the flow to improve the rate of recharge and also to divert water to Quarry Lakes, where water has more opportunity to percolate down into the underlying groundwater basin.

“Percolation” sometimes makes people think of an old-fashioned coffee maker. While it’s the same slow filtering principle, the time it takes for water to seep through all the layers of the Niles Cone is significantly longer. Yet it’s not as long as it is in other aquifers across the country where it may take 100 years to recharge an aquifer. This is why groundwater management is so important.



ACWD uses Quarry Lakes to recharge the Niles Cone Groundwater Basin, a 100-square mile underground water system.

The state finally released its findings on Alameda Creek flows as part of the District’s lawsuit with Spring Valley. The state’s lead engineer, Paul Bailey, developed an elaborate formula to show the relationship between Alameda Creek flows and groundwater recharge rates in the Niles Cone. This became known as the Bailey Formula, and it would be used for years to determine how much additional water Spring Valley should release back to Alameda Creek.

Neither party particularly liked the formula, but the State Water Commission adopted it. They also granted permission for Spring Valley to build additional

storage, but ordered them to install monitoring stations in any facility they would build in the Alameda Creek watershed. The U.S. Geological Survey set up a gauging station on the creek in Niles Canyon to keep an eye on how much water was coming through.

The state’s decision assured some recharge flows to the Niles Cone, but they then reduced the volume of releases by 16.5 percent because Spring Valley held rights to so much land along Alameda Creek. ACWD thought this was unfair and appealed, but was not successful. Private property owners likewise failed in their own lawsuits against Spring Valley.

At one time Alameda and Santa Clara counties produced most of the commercial apricots in the state. Urban development after the 1960s displaced the orchards and growers moved to the Central Valley.

Dried Fruits and Canned Goods Were Big Business

At ACWD's inception 100 years ago, the need for water to irrigate Washington Township's fields and orchards was no small matter. Daniel Bradley, writing about farms, orchards, and vineyards in a 1915 Alameda County pamphlet, noted that the county "produces more dollars' worth of farm products per acre of area than any other county in the state except one."



Monthly crop reports in 1917 from *Western Canner and Packer* show that Alameda County was producing significant amounts of almonds, apples, apricots, berries, cherries, figs, peaches, pears, plums, prunes, and walnuts. To process this, the county had ten fruit and vegetable canning plants, a dozen large wineries, and a large beet sugar factory, according to Bradley.

The issue of water for crops became critical in 1917 for another reason: the U.S. entered World War I in April, creating an immediate need for rations for soldiers overseas. *Western Canner and Packer* reported that government

representatives met with area growers to spur greater production. Growers needed water.

The government particularly wanted tomatoes, and encouraged new planting and canning at record levels. Frank Booth, a sardine canner in Monterey, established the F.E. Booth cannery in Centerville to tin up tomatoes and fruit juices. This operation eventually became the largest business in Centerville.

Other local canneries, drying operations, and packing houses became part of the war effort, because all fruits – canned and dried – were in demand. The Ellsworth Packing Company in Niles became the receiving station for the Prune and Apricot Growers' Association. Later that year, the association recreated itself as Sunsweet, a major brand that still exists today.





In 1915, Alameda County was one of the better-known grape-growing districts in the world. Although most of the notable vineyards were in Livermore, table grapes were still grown in the Mission San Jose and Decoto areas. Washington Township's gravelly soils were very good for grape growing. Shown here in an 1880 photograph is the Thompson Seedless grape, which was introduced into California only eight years before this photo was taken. Initially, these incredibly versatile grapes were grown statewide for wine and raisins as well as for the table. Today Thompson Seedless grapes are grown mostly in the San Joaquin Valley. It is now the most widely planted grape in California.

The Hetch Hetchy System Became a Valuable Source of Imported Water for ACWD

The completion of the Hetch Hetchy system resulted in a significant step forward for Washington Township in attaining water independence. Today, almost ninety years after it was built, it provides water for more than two million people throughout the Bay Area. ACWD purchases a portion of its water from San Francisco, which owns the system.

The Hetchy Hetchy Valley was chosen not only for water storage, but also for its potential for hydroelectric generation. The Moccasin Penstock, shown here in 1925, is a pipeline that delivered water via gravity to the Moccasin power plant where it generated electricity. The Moccasin power plant is one of three in the Hetch Hetchy system.



How the Hetch Hetchy Project Saved the Niles Cone

Since 1911, Washington Township had supported San Francisco's campaign to create a storage system on public lands in the Hetch Hetchy Valley of Yosemite National Park. San Francisco had filed for water appropriations on the Tuolumne River in 1901. The request wasn't approved until two years after the 1906 earthquake revealed just how inadequate the city's water system was. In 1913, the City asked for the rights to the Hetch Hetchy Valley through a special act of Congress. Rep. John E. Raker of Manteca agreed to carry the legislation.

The Raker Act was hotly debated in the House of Representatives in the summer of 1913. Dubbed "The San Francisco Philistines" by the *New York Times*, the California delegation lobbied hard for it. John Muir and the Sierra Club had fought against damming the Hetch Hetchy Valley for years and vigorously opposed the Raker Act. The controversy was covered by the nation's leading newspapers.

By the end of the year, both the House and the Senate passed the Raker Act. The first Hetch Hetchy contract was awarded in 1914. Construction continued for two decades on five dams, a hydroelectric power plant, 150-miles of pipelines, reservoirs in San Francisco – and also on miles of mountain tunnels, a railroad, roads and bridges, sawmills, pumping stations, and a trestle to cross the Dumbarton Straight.

About the time San Francisco was building the Hetch Hetchy project, Oakland also had a project underway:

water storage on the Mokelumne River. Yet even as both cities undertook construction of these huge projects, they still needed Washington Township water.

Finally, relief came. The urban areas in northern Alameda County formed East Bay Municipal Utility District, and they completed their Mokelumne project in 1929. That meant ACWD could take back the Alvarado wells. Residents quickly approved a bond measure to do just that.

The biggest change came in 1930. After a half-century of effort, San Francisco was finally able to buy out Spring Valley Water Company and all of its assets. And in four more years, the Hetch Hetchy system was ready.

The water was piped down the mountains directly into the "gatehouse" at Irvington – and then on to Crystal Springs Reservoir by another pipeline across the bay.

Water from Hetch Hetchy and the Mokelumne River not only took pressure off of ACWD's resources, but also provided additional supplies for cities and water districts throughout the Bay Area. Finally, it seemed as if the water picture was rosy.



This 1926 photo shows construction at O'Shaughnessy Dam. The dam blocks the Tuolumne River as it flows out of Hetch Hetchy Valley, creating Hetch Hetchy Reservoir.



This aerial view of the Glenmoor area in June 1960 shows Fremont in transition from an agricultural to urban region.

Chapter 3 • From Farms to Picket Fences

Rapid growth after World War II changed the Township after a century of agriculture

At the end of World War II, Washington Township began to grow, creating greater demand for a municipal water system. This was a challenging order for a water district that had little more than a decade of experience running a distribution system.

In 1930, ACWD bought the Alvarado wellfields from Oakland. The District tried – and failed – to convince Oakland to keep the small distribution system that came with the wellfields.

“We didn’t want to get drawn into the water distribution problem in this area,” said Will Patterson, one of ACWD’s founding Directors. The facilities were not in good condition. The main water pipe was old and in danger of bursting. The maintenance costs were high, an additional burden during the Great Depression.

By the early 1940s, ACWD had acquired several good-sized systems. The largest of these was the Juan Gallegos Water Works, which operated in the Mission San Jose area. The District purchased the first segment of the Gallegos system in 1940. During negotiations, an area property owner offered a reservoir site on his property, and a local Congressman facilitated the District’s request for Works Progress Administration (W.P.A.)

funding to construct a 100,000-gallon reservoir and a 30-inch pipeline.

New residential areas throughout Washington Township needed service, which the District provided. ACWD also worked with fire districts to add pumps to boost fire protection as the towns were growing. The District replaced old water mains with larger ones in response to complaints about low water pressure from urbanizing towns. In some areas, ACWD leased private wells to keep up with demand.

The problem with providing service using the systems from many different water companies was that they were not connected to each other. ACWD worked through the 1930s and into the 1940s installing new water mains and even building new reservoirs, ultimately integrating mains at Alvarado, Niles, Centerville, Newark, Mission San Jose, and Irvington.

The *Township Register* enthusiastically observed, “When mains are completed between Mission San Jose and Irvington . . . the circle of the township will be finished and a domestic supply of water will be assured for this district for all time.”



District crews were busy in the 1950s and 1960s keeping up with growth. In this photo, a district employee installs a water meter in a new subdivision in 1961.



After spending twenty years acquiring disparate, private water companies in Washington Township, ACWD was faced with a developer in Irvington who wanted to set up his own water company. This led the District to create new, written policies which emphasized that "Growth Pays for Itself."

That equilibrium did not last long. The post-World War II boom soon hit.

During the 1950s, the sound of hammers rang out across the Township. In the first half of 1950 alone, hundreds of homes were under construction or in the planning stages. The Board had to shift its thinking from agricultural toward residential service. The transition was not smooth.

Some developers worked well with the District, but one in particular – Conway and Culligan – did not want to pay what the District felt was fair to connect to the ACWD system. The developer concocted a plan to drill its own wells and create a water company to provide service to new homes it wanted to build in Irvington (part of today's Fremont).

The problem, of course, was that the wells would have tapped into the Niles Cone Groundwater Basin. That would mean the District would be supplying a competitor with water that ACWD had recharged into the aquifers for the benefit of its own customers. If Conway and Culligan had been allowed to set up its own water company, it would have created a potentially chaotic situation within the District's service area. The Alameda County Board of Supervisors heard the District's concerns and agreed with ACWD's point of view. They denied the developer's application for a water company. Fearful of potentially losing approval of their subdivision, the developer agreed "under protest" to ACWD's terms for water.

This battle showed the Board that the District needed new, written policies to deal with the cost of providing service to the new subdivisions. It took six months to create a comprehensive plan, which the Board then enacted. The resolution “was the future format and the bible on how we were going to pay for things: who was going to pay for water mains, whether there was going to be reimbursement . . . and all that,” noted Matthew Whitfield, General Manager/Chief Engineer of ACWD from 1953 until 1977. The plan established a basic policy: “Growth pays for itself.” ACWD still adheres to this policy today.

Although the District would require developers to pay for new connections, the District’s policy was to continue to pay for major facility improvements as well as additional storage and water supplies that the growing area needed. But Directors had conflicting opinions about how to meet future demands, and the increasing urbanization of the area caused discord among the District’s water users as they competed for scarce supplies. This, in turn, complicated ACWD’s ability to create a good plan for domestic and municipal supplies as well as for agricultural irrigation.

This issue came to the forefront in 1954 when the District drilled the Soito well west of Newark to improve domestic service to that city. Farmers complained that pumping from the new well caused a drop in water levels in their own wells – and allowed salt water to intrude into the aquifers. One of the affected farmers, L.J. Milani, grew exasperated. “We’re hiring a lawyer,” he told the *Township Register*. “Beets can’t live on salt water.”



The photos of the corner of Mission Avenue and Stanford Avenue in the Warm Springs area of Fremont show homes under construction during the building boom (above) and again the same location in 2014 (below). Originally this was the approach to Weibel Winery and Hidden Valley Ranch.





ACWD Director John Phil (left) and General Manager Matt Whitfield tested a newly installed fire hydrant in the Warm Springs area in the late 1950s. The District expanded and upgraded service throughout Washington Township as the area's population rapidly grew.

Milani and others followed through on the threat. They sued and obtained an injunction against operation of the Soito well. Their anger and urgency were understandable. The area had experienced droughts throughout the Depression years, and again a decade later in the 1940s. As recently as the summer of 1948, because of drought, water levels in wells had dropped at a rate of one foot a week. Yet as the wells were drying up in those years, more people were moving to Washington Township, exacerbating not just the water supply problem, but also the problem of managing water for agriculture as opposed to municipal uses.

Although the District reached a settlement with the farmers later in 1954, the Board was divided on whether to pump from that well again – another irrigation versus municipal use conflict. Two directors believed the District had gone to considerable expense to drill the well and that the alternative – replacing that supply with Hetch Hetchy water for Newark customers – would cost more than pumping. But the other three directors overruled them and voted to close down the Soito Well and buy Hetch Hetchy water.

That wasn't the end of it. Two weeks later the Board reversed the decision, which, like the housing developer's water company scheme, could have created a precedent that could negatively affect the District in future years: others in the service area with private wells could compel the District to close its wells. The issue was not completely over. The Board waited until November to resume operations at the Soito well. That

The new projects and financing plans came just in time. Applications began coming in not for hundreds, but now for thousands of new homes. Between 1950 and 1960, the area's population grew from 16,000 to 60,000. As the newly incorporated cities of Fremont, Newark, and Union City grew and expressed their own identities, the century-old Washington Township identity faded. Farms and orchards gave way to houses, businesses, and shopping malls. This pace of growth wouldn't let up until the 1980s.

Top left: Groundwater remained an important source of supply for the District. In this photo, crews set a submersible pump and column pipe in the 1960s at Peralta-Tyson Well No. 2.

Below: Trenching in the early '60s for new mains in an section of Washington Township that remained agricultural.



was after the rains came and farmers were not so reliant on their well water for irrigation.

The District created an opportunity out of the incident to develop policies for dealing with the demands of existing and anticipated growth. In 1955, ACWD completed a water supply and distribution study, which focused primarily on distribution storage reservoirs and transmission lines. Recommended projects in the study became the basis of a bond issue to finance necessary capital improvements. Residents understood the issues and needs. In March 1956, voters passed the \$4.3 million general obligation bond measure by 1,914 to 541 votes.





The free-flowing streams of southern Alameda County attracted early residents to the region. Through flood and drought, ACWD manages its water resources today to provide local residents with a reliable supply of high-quality water at a reasonable cost.

Chapter 4 • Every Drop Matters

ACWD searches for new sources of water to meet changing demand created by robust population growth and industrial development

In 1989 the Board formalized a mission statement: “To provide the residents of Fremont, Newark and Union City with a reliable supply of high quality water at a reasonable cost.”

This mission always has been implicit. This is what drove the District from its beginning, whether it was wresting control of water rights from much more powerful entities or collaborating with regional and state agencies to create significant sources of new supply. ACWD’s support of San Francisco’s Hetch Hetchy project is one example of long-term benefits of regional cooperation. The South Bay Aqueduct is another.

Since the 1940s, the State had been working on plans for the Feather River Project, later called the State Water Project. Unlike the Central Valley Project, which was a federal plan to transport water from the north end of the Central Valley to the south end, the idea of the State Water Project was to capture and store water in the northern Sacramento Valley and move it to the Bay Area and Southern California.

The plan was controversial. The North State saw it as a “water grab” by urban areas in Southern California. But there was great potential for the District in the State

Water Project, and ACWD pursued the possibilities. The plan proposed a massive dam near Oroville and a canal to run south along a 750-mile route on the west side of the Central Valley. The District became particularly

Del Valle Reservoir, shown in 1971, was developed as part of the South Bay Aqueduct project.





Once the South Bay Aqueduct project was approved, construction went swiftly, and water was delivered to ACWD within two years. With the machinery pictured here, crews could lay and finish concrete at a rate of approximately 1,000 feet a day.

interested in a proposal to bring some of the water over the coastal range to the South Bay.

The issues were highly political, and the project was not moving forward in the Legislature. This made the District a bit skeptical about the feasibility of a South Bay Aqueduct, and it refocused attention on boosting local supplies. The District filed an application for water from Arroyo del Valle with the state Water Rights Board. The plan to create a reservoir there was complicated by existing water rights, legal issues, and a state analysis that initially did not support a dam at that site. So not only was the State Water Project adrift, the Arroyo del Valle project was barely inching forward. That sluggish pace was about to change.

Edmund G. “Pat” Brown was elected governor in November 1958. This dramatically changed statewide water planning dynamics. The new governor supported the State Water Project and the South Bay Aqueduct idea. He broke the political logjam in Sacramento. In June 1959 the Legislature appropriated funds for the first stage of the South Bay Aqueduct. And in November 1959 Governor Brown was the principal speaker at the project’s dedication ceremony.

But before construction could get underway, voters had to approve the financing. Northern California didn’t like the plan. Even the *San Francisco Chronicle* stood against it. On November 8, 1960, area voters hammered the plan. All but two Northern California counties voted against the bonds. Alameda County voters turned down the measure by a four-to-one margin. Southern California,

however, determined the outcome and the measure was approved by a very slim margin. The South Bay Aqueduct would finally become a reality.

As they say, hindsight is twenty-twenty. It turned out to be a great idea for the Bay Area. Water would be pumped from the Central Valley up and over the hills near Livermore, where it would pass through a reservoir system that included the Del Valle project, and then on to San Jose. The District proposed a short cut in the state route, saving about \$2 million on construction costs.

Even with Del Valle in the plan, it was not time for streamers and confetti at the District office yet. The District had always intended to use the Delta water for groundwater recharge. In the eleventh hour, the California Department of Water Resources suddenly had a problem with that. The State wanted the water to go directly to customers. More negotiations ensued.

An issue for the District was that no one could drink water straight from the aqueduct. By the time the water made its way from Sierra snowmelt to the District, it was full of peat, pesticides, and loads of organic material from the agricultural regions along the route. The District negotiated a fair agreement: ACWD would use part of the water for groundwater recharge and – after building a new plant near Mission San Jose to treat the Delta water – deliver the other part of the water supply directly to customers.

The contract was signed December 27, 1961. Construction was fast and furious. The pumps were activated on

June 7, 1962, and ACWD became the first water district in California to receive water from the State Water Project.

Subtle Changes Bring Big Results

While that was a dramatic addition of a new supply of water, some other big advances came with small improvements. One approach ACWD has always taken is to find

Mission San Jose Water Treatment plant was constructed in 1976 to treat Delta water delivered to the District via the South Bay Aqueduct.



Quarry Lakes

Quarry Lakes Regional Recreation Area is a landmark project in the Tri-Cities area. It is a recreation destination and an impressive water feature from any angle. It is also one of the more innovative and ambitious examples of water stewardship in California. With the development of Quarry Lakes, the District expanded its ability to capture and store runoff from Alameda Creek, releases from Del Valle Reservoir, and the supplies from the State Water Project.

The ultimate goal – groundwater recharge – is possible because land beneath the lakes is a combination of sand and gravel, and the gravel beds are deep as well as wide. This combination creates the aquifers of the Niles Cone groundwater basin. Because gravel, sand, and rock are desirable

construction materials, the area became home to many quarries where these materials were mined. As the decades wore on, the quarries played out and many companies abandoned their gravel pits and moved on.

ACWD saw the quarry pits as an opportunity to enhance groundwater recharge, and bought a pit from Western Pacific Railroad in the 1930s. Then in 1948 the District bought the Pacific Coast Aggregates quarry and also leased former Board President J.C. Shinn's 69-acre pit. In addition, ACWD made agreements with operators of existing pits for stormwater diversion. By the 1960s, especially after obtaining South Bay Aqueduct water for groundwater recharge via Alameda Creek, the District saw the need for more percolation capacity and looked to the abandoned quarries with their large, steep-walled pits and saw opportunities for storage and percolation.

Quarry Lakes is one of the more innovative and ambitious examples of water stewardship in California.



There was even more potential in the pits: recreation. There always has been some form of recreation along Alameda Creek. For instance, Joyland Park had been a favored destination since the late 1800s. District Directors saw an opportunity to use the area to expand water-based recreation, and others in the region were thinking the same thing. ACWD staff started exchanging ideas with the East Bay Regional Park District in the early 1970s, and in 1975 both districts chipped in to buy 70 acres of abandoned quarry pit land from Lone Star Industries. In 1976 ACWD entered into a joint use agreement with the East Bay Regional Park District and the City of Fremont to jointly develop the percolation pits and adjoining properties owned by all agencies. This included the Shinn and Kaiser pits and the Bunting, Ford, and Grau ponds.

It took years to acquire all the pits needed for the project. In fact, all the pieces were not in place until 1992. With input from neighbors, ACWD cleared the land and graded the steep quarry walls, converting them into gentle slopes so the land would be suitable for recreation. The grading process also increased the area available for groundwater recharge.

East Bay Regional Park District then was able to construct the long-planned park facility with swimming, boating, picnicking, hiking, and wildlife viewing. By the time the project was completed in 2002, the park area totaled 471 acres, including 350 acres of lakes.



ACWD and East Bay Regional Park District transformed old quarry pits and ponds into a recreational resource for the entire region.

In the heavy rains of Christmas Eve 1955, Alameda Creek overflowed its banks in the Niles and Alvarado areas, submerging fifteen square miles of residences, businesses, and farmlands. Flood waters broke through a levee at a percolation pond and then flooded Union City. The flood brought about new policies and a turnover on the Board of Directors.

ways to get the most out of existing resources, including maximizing the percolation capacity of Alameda Creek to capture and use as much water as possible to recharge the Niles Cone. In the District's early history, crews cleared debris out of the creek to improve percolation. Later the District used small earthen dikes

to impound water in the dry season, and then took them down during the rainy season.

Yes, the rainy season – the paradox of water planning in Southern Alameda County. At one time, floods were as big a problem as the droughts. The area had its worst



flood in 1955. It was the greatest flood on record in northern and central California. Locally it put at least fifteen square miles under four to five feet of water. That flood brought about a lot of changes. The District raised levees along the creek and around the old quarry percolation pits to provide immediate protection, and then looked for longer-term solutions.

With the help of the Army Corps of Engineers, the Alameda County Public Works Agency, which was responsible for flood control in the area, widened a twelve-mile stretch of Alameda Creek. This was truly a conservation and flood control project, for the widened channel could handle excessive runoff in Alameda Creek. Also, exposing more of the gravel surface area above the Niles Cone vastly enlarged the area that could be used for percolation. It was the same principle used decades before to expand recharge, but this time it was on a big scale.

The District then maximized that capacity by creating a new way to impound water and divert it from Alameda Creek. ACWD moved away from the earthen dike approach and installed its first rubber dam. It was 275 feet long and 13 feet high, the largest of its type in the world at the time. Crews could efficiently inflate it and deflate it according to need and weather. The District used the dam to conserve an additional 4,000 acre-feet of water per year.

The search for new sources of water continues, and it becomes even more urgent in the face of repeating drought cycles. In 2014 the District forged a local water



transfer agreement with Contra Costa Water District, purchasing and storing 5,000 acre-feet of water in their Los Vaqueros Reservoir. During the summer – in one of the worst droughts in the state's history – ACWD withdrew the stored water, which represented about 15 percent of the District's annual water supply. This approach to short-term water storage showed the value of regional cooperation and will be explored further in coming years.

This aerial view shows the Alameda Creek Flood Control Channel after the creek was widened in 1972.



Clean drinking water is a priority for ACWD, which has acted since its inception to protect the Niles Cone Groundwater Basin.

Chapter 5 • Water Quality Challenges

Protecting local water from pollution and salt water intrusion while improving drinking water quality is an ongoing effort

When the Tri-Cities area was growing, so were nearby towns and communities. One of these, the Livermore-Amador Valley, discharged treated wastewater into creeks and streams that fed into Alameda Creek. Runoff diluted the discharge during the rainy season, but the “effluent” became concentrated in the dry, summer months, especially as the area grew during the 1950s. Board members felt the wastewater should be piped to the Bay to avoid contaminating the groundwater basin.

The District raised the issue many times in the 1960s. The Regional Water Quality Control Board weighed in on the issue in 1971 and reiterated ACWD's long-held position that waste dischargers should not degrade groundwater. In 1972 the Board considered legal action to stop the discharges to Alameda Creek's tributaries. “Why should the Valley have a license to pollute?” asked ACWD Assistant Chief Engineer Stan Saylor in a newspaper interview. “This is ridiculous.”

Under threat of lawsuits from the Regional Board and ACWD, the cities of Pleasanton and Livermore, plus the Valley Community Services District, formed a joint powers agency and proposed a regional solution to the sewage discharge problem: a pipeline that would

transport treated wastewater over the East Bay hills and ultimately to the deep water outfall in San Francisco Bay. The only problem with the plan was that residents there didn't want to pay for it and rejected a financing proposal.

The joint powers agency ultimately put together a non-voter approved \$3 million debt package to pay for their share that was not covered by approximately \$20 million in federal and state grants to fix the problem. Cautious and realistic, the District stood by with a lawsuit ready to file until the 16-mile pipeline went into operation in 1979, bringing to an end nearly thirty years of effort to curtail waste discharge into Alameda Creek.



Upstream discharge of wastewater resulted in pollution and foam in Alameda Creek. This photo shows the view downstream from Vallejo Mill Diversion Dam in March 1963.



ACWD director Harry Brumbaugh and community activist Irene Vincent celebrated ACWD's purchase of Citizens Utility Company at a community event.

Dirty Water and Drama

One of the most dramatic water quality issues in ACWD's 100-year history unfolded in the 1960s. At that time, the last private water company in the area distributed water to about 3,000 residents in the Niles district of Fremont and the Decoto area of Union City. Residents there had long complained about their water.

ACWD wanted to acquire the firm's water distribution system before the company expanded in Niles and Decoto and became too costly. That idea didn't move forward right away. In 1968, customers of the water distributor, Citizens Utility Company, gave the Board a petition signed by more than 1,500 Union City residents asking ACWD to provide them with water. Residents complained about fluctuations in water pressure, issues related to the antiquated distribution system, and the poor quality of water from Citizens' wells.

The Board made an offer to Citizens, but the company set a price almost \$2 million higher than the valuation. That cost, plus the expense of upgrading the private company's system, led the Board to table the issue. But local residents didn't give up, and they used their grassroots organization, People for Better Water Committee, to press for change.

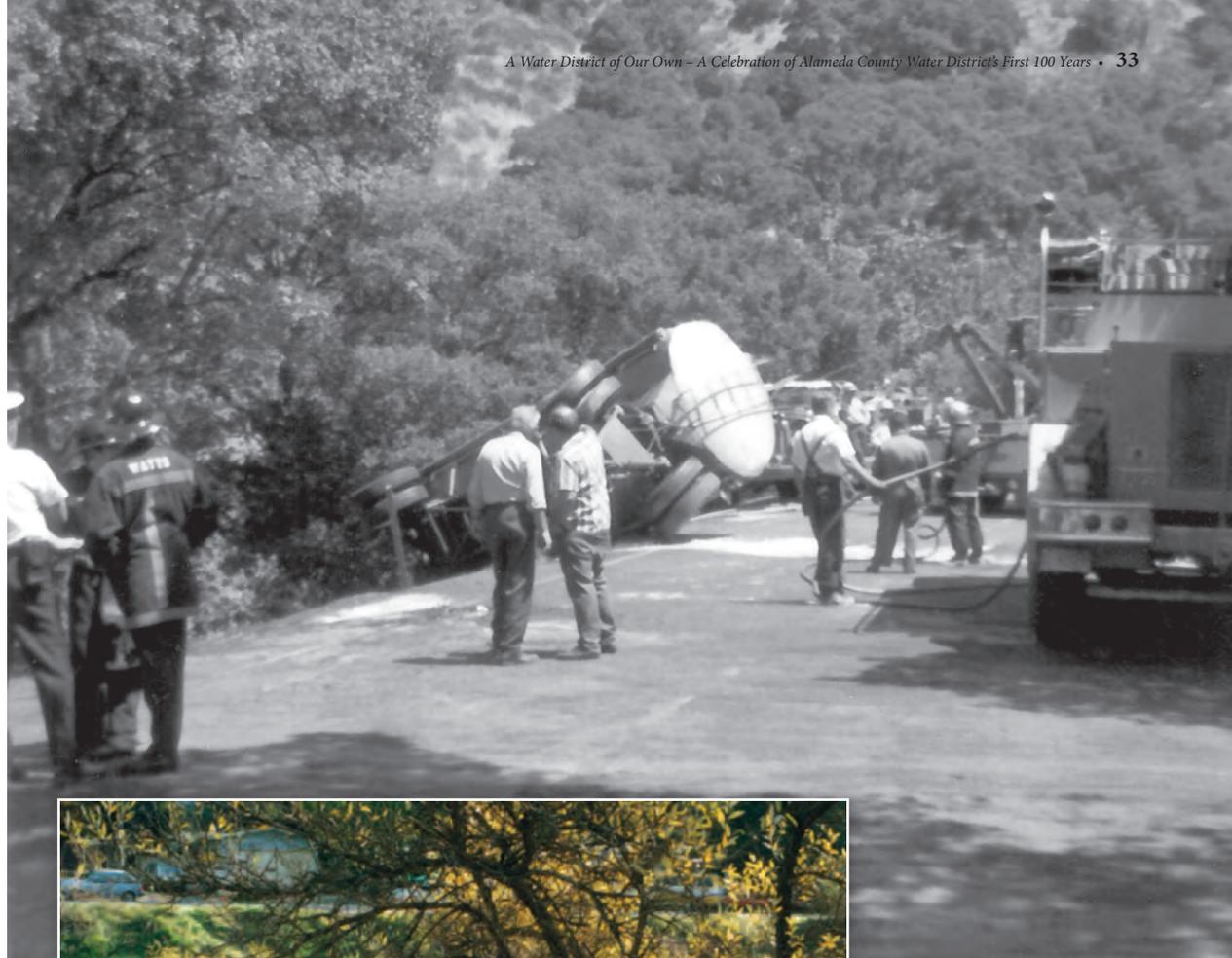
In the 1970s, the group staged media events that garnered quite a bit of attention and made their case. At one of the public hearings, group president Irene Vincent showed up with liquid evidence – a container of brown water coming from one of the Union City customer's homes. Another time she brought two glasses containing clear

and brown water and poured one into the other, mocking a politician's proposed solution of blending better water with Citizens supply, calling it "homogenized filth."

The water wasn't getting any cleaner, and at one point, Citizens directed their customers to boil their water because of contaminants. Adding insult to injury, Citizens raised rates 67 percent and was asking for another rate hike. People for Better Water tried unsuccessfully to get Citizens' water supply permit revoked.

ACWD still wanted to buy the system and already had annexed the Niles and Decoto areas. The Board commissioned another study to reassess the value of the private system. The company continued resisting a sale, and the Board initiated condemnation proceedings against Citizens, stating it was in the public's interest to acquire the company's system. In November 1973, the District held an election and asked residents in Citizens' service area to take on \$2.85 million in debt to purchase and improve the water system. The measure passed with 85 percent in favor.

In June 1975 the condemnation proceedings concluded with a reasonable jury award – which the judge then set aside and revised to \$5 million – nearly twice the assessed valuation for the system. Meanwhile, the California Public Utility Commission wanted ACWD to sell water to Citizens. That not only violated the laws that governed the Hetch Hetchy water ACWD received, it also would have increased the value of the private water company, making it even more expensive to purchase. The District refused.



Alameda Creek (left) flows beside Route 84 along a narrow seven-mile stretch through Niles Canyon. Accidents and spills in this area pose a threat to local water supplies. In 1971 a Phillips 66 tanker tipped over (above), but fortunately did not release chemicals into Alameda Creek. This was one of the incidents that spurred the District to advocate for a ban on hazardous chemical transport on Route 84, Niles Canyon Road.

ACWD's water quality laboratory tests water for many substances.

The matter came to a head at a 1976 Board meeting that was attended by heavy-hitters from the offices of the state Public Utility Commission, State Attorney General, and Department of Health. That meeting provided clarity and

direction. In short order, a price was set and the Board asked ratepayers to approve bonds to raise the additional money for the purchase. The proposal passed easily and the transfer of the Citizens Utility Company system took place in October. The District finally was able to update the substandard system and deliver significantly improved water to the new customers in Niles and Decoto.

Leaks and Creeks

Spills of toxic and hazardous materials in the 1970s made headlines across the country and in the Tri-Cities area as well: a failure at the Amchem plant in Niles in 1978 resulted in a chemical discharge into Alameda Creek. The District was able to quickly respond, lower the inflatable dams across the creek, and flush the polluted water into the Bay to prevent seepage of contaminants into the aquifers.

The leak highlighted the potential vulnerability of local supplies. The District responded with a realistic assessment of possibilities and identified all potential dischargers of pollutants within the entire watershed. Then staff developed contingency plans to deal with spills from any of those sources to protect the water supply.

ACWD also took steps to protect Alameda Creek through Niles Canyon. This seven-mile stretch flows very close to Route 84 – Niles Canyon Road. The area historically had been the site of automobile and truck accidents and spills that fortunately had not contaminated the creek, but the potential was there. The District worked with state legislators and was able to restrict the transportation of hazardous materials through Niles Canyon.

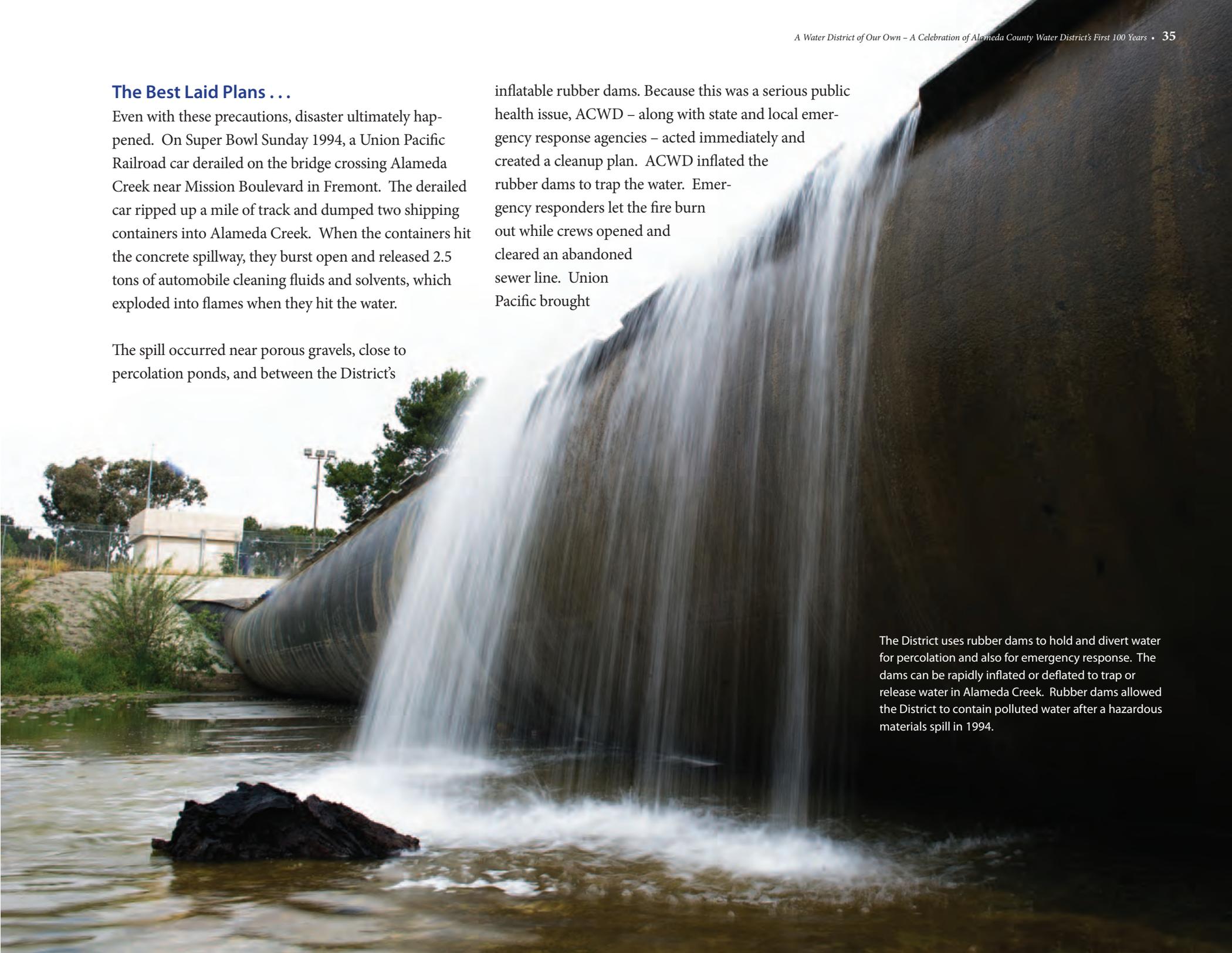


The Best Laid Plans . . .

Even with these precautions, disaster ultimately happened. On Super Bowl Sunday 1994, a Union Pacific Railroad car derailed on the bridge crossing Alameda Creek near Mission Boulevard in Fremont. The derailed car ripped up a mile of track and dumped two shipping containers into Alameda Creek. When the containers hit the concrete spillway, they burst open and released 2.5 tons of automobile cleaning fluids and solvents, which exploded into flames when they hit the water.

The spill occurred near porous gravels, close to percolation ponds, and between the District's

inflatable rubber dams. Because this was a serious public health issue, ACWD – along with state and local emergency response agencies – acted immediately and created a cleanup plan. ACWD inflated the rubber dams to trap the water. Emergency responders let the fire burn out while crews opened and cleared an abandoned sewer line. Union Pacific brought

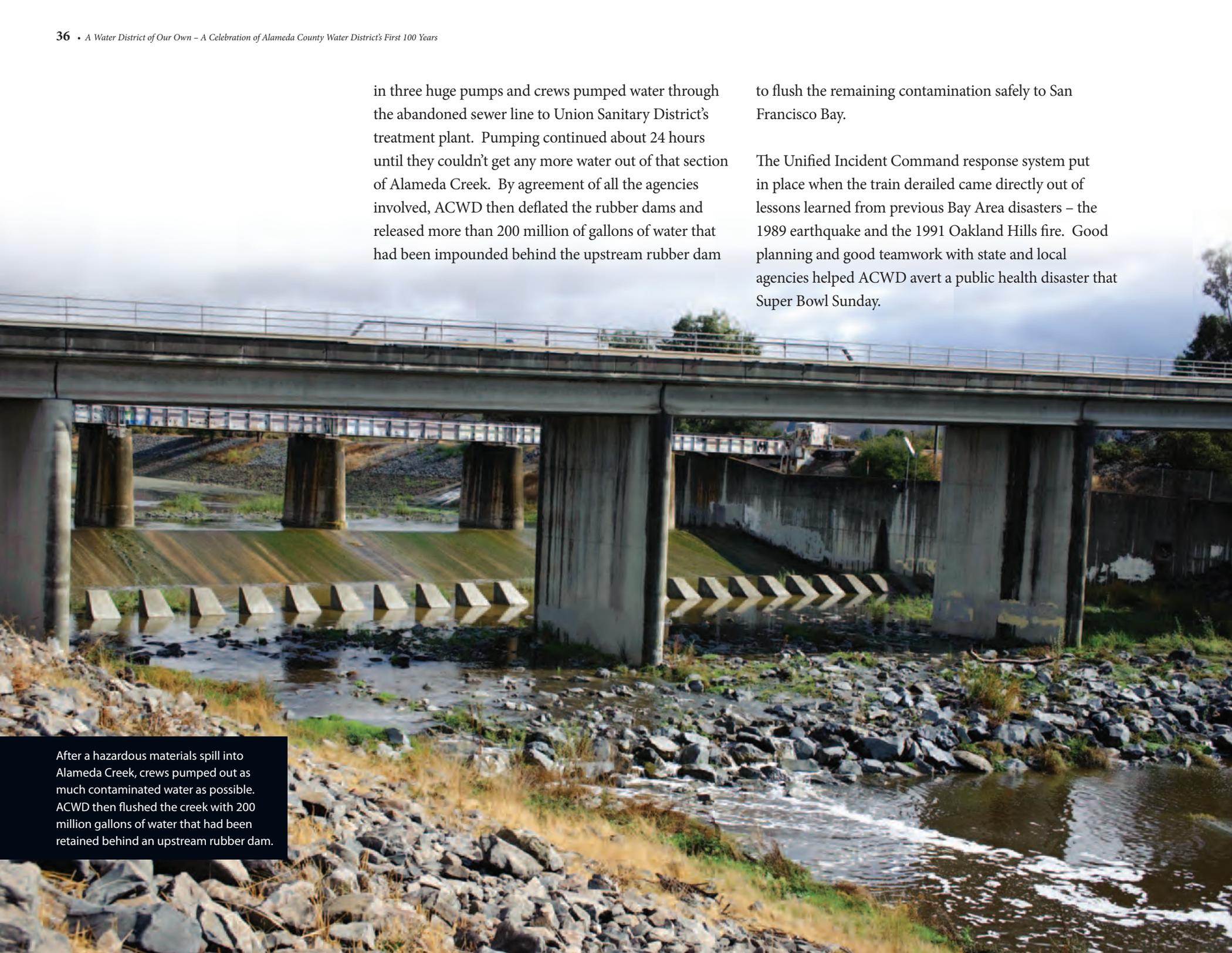


The District uses rubber dams to hold and divert water for percolation and also for emergency response. The dams can be rapidly inflated or deflated to trap or release water in Alameda Creek. Rubber dams allowed the District to contain polluted water after a hazardous materials spill in 1994.

in three huge pumps and crews pumped water through the abandoned sewer line to Union Sanitary District's treatment plant. Pumping continued about 24 hours until they couldn't get any more water out of that section of Alameda Creek. By agreement of all the agencies involved, ACWD then deflated the rubber dams and released more than 200 million of gallons of water that had been impounded behind the upstream rubber dam

to flush the remaining contamination safely to San Francisco Bay.

The Unified Incident Command response system put in place when the train derailed came directly out of lessons learned from previous Bay Area disasters – the 1989 earthquake and the 1991 Oakland Hills fire. Good planning and good teamwork with state and local agencies helped ACWD avert a public health disaster that Super Bowl Sunday.

A photograph showing a concrete bridge with multiple pillars spanning over a creek. In the background, there is a dam structure with a series of concrete blocks. The foreground is filled with rocks and some dry grass. The sky is overcast.

After a hazardous materials spill into Alameda Creek, crews pumped out as much contaminated water as possible. ACWD then flushed the creek with 200 million gallons of water that had been retained behind an upstream rubber dam.

Salt Water Intrusion – A Supply and Demand Seesaw

One of the most persistent water quality problems in the region is the intrusion of salt water into the aquifers and wells. When the water level in an aquifer drops because of inadequate recharge or because too much water is pumped out, salty water from the Bay infiltrates the aquifers. It has been a problem for 100 years and one that requires continuous monitoring.

When Washington Township water came solely from the Niles Cone and Alameda Creek, droughts often resulted in the infiltration of salt water into the water supply. This was a significant problem in the 1920s when private water companies exported water from Alameda Creek to other cities around the Bay. That problem was not alleviated until after San Francisco began importing water from Hetch Hetchy. That meant San Francisco would take less water from the Alameda Creek watershed and could bypass extra water to Alameda Creek.

Exporting water was not always the cause of salt water infiltration. As the District grew, demand grew. The Soito Well issue discussed in Chapter Three was a prime example of growth and very different needs. Not only did a drought exacerbate the supply problem and conflicts between agricultural and municipal users, the water level

dropped and salt water infiltrated some of the wells used for irrigation. That led some farmers to abandon irrigation entirely (and imperil their crops), not just because water was scarce, but also because the salty water would kill the crops and ruin the soil.

At the time, the ways of dealing with salt water in the aquifer included purchasing extra water from Spring Valley Water Company (in the early days) or later from San Francisco. During drought, however, water was scarce. Later, the District was able to purchase extra Hetch Hetchy water, and also worked to increase percolation capabilities in the Niles Cone gravel areas by impounding water behind small dams, clearing debris out of Alameda Creek's gravel beds, and flooding old quarry pits.

In the 1960s research found that abandoned, defective, and improperly constructed wells contributed to additional salt water intrusion in the aquifers. The District adopted – and enforced – standards for well construction and sealing abandoned wells. This effort continues today.



ACWD has been monitoring wells throughout the area since the District was founded. Today crews drill monitoring wells (above) to assess the intrusion of salt water into area water supplies.



Lake Del Valle sits in the hills in Alameda Creek's upper watershed.

Chapter 6 • Drought and Water Conservation

Modern droughts changed water use and unreliable supply changed the District's focus

Southern Alameda County has always experienced cycles of flood and drought. One of the most severe droughts in the state's history lasted, in some parts of California, from 1928 to 1937. Another serious drought occurred just ten years later. These were challenging, but the 1976-77 drought hit so hard it set records statewide. In fact, 1977 turned out to be the driest year in California since records were started more than 100 years earlier.

State Water Project allotments were reduced, and San Francisco reduced its water allocations as well. In May 1977, ACWD declared a water shortage emergency and implemented a plan to achieve a reduction in water use 25 percent below 1976 levels, a move which qualified ACWD for additional emergency State Water Project supplies.

The District encouraged conservation by imposing excess use charges and also by distributing water conservation kits, which consisted of bottles to displace toilet tank water and showerhead flow restrictors. The measures don't sound terribly sophisticated compared to today's tools and techniques, yet customers responded so well that in less than one month, they'd slashed their water use by 45 percent. This huge reduction put

ACWD in the uncomfortable position of either raising rates by 25 percent or ending the mandatory rationing program less than three weeks after starting it. The District decided to end mandatory rationing. This decision was so controversial that ACWD briefly was in

The 1976-77 drought set new records, leaving California with dangerously overdrawn groundwater basins and record low storage in its reservoirs. In the Central Valley, water levels in Folsom Dam (below) were so low that islands appeared as water receded.



the national media spotlight. The Department of Water Resources threatened to revoke the District's agreement for additional water.

Ending mandatory rationing did not mean the end to conservation and customers understood that. It took quite a while to convince other districts, the media, and the state, but ultimately the District was able to prove that ACWD customers' water consumption was at least 25 percent below the previous year. In fact, it was 34 percent lower, and it was all voluntary.

In 1991 ACWD joined 120 water agencies and public interest groups in a statewide effort to conserve water. The District offered ways for ratepayers to save water such as low-flow fixtures and leak-detection kits for toilets.



During the winter of 1977-78, normal rainfall resumed. The drought had been severe but mercifully short-lived. The next big statewide drought, however, lasted from 1987 to 1993 – the longest drought in modern California history.

Although having multiple sources of supply made ACWD's water situation somewhat more favorable than that of other Bay Area water agencies, the District still needed to conserve and asked customers to cut back use by 10 percent. Area customers exceeded the conservation goals once again. The following year, customers reduced their water use by more than 10 percent below 1987 numbers.

At the end of 1990, statewide reservoir storage was at 54 percent of average. If dry conditions persisted for the next sixty days, ACWD's supplies from the state and San Francisco's Hetch Hetchy system would be cutback by as much as 50 percent. The District developed scenarios for how much short-term groundwater pumping could make up the anticipated worst case supply shortfall, and what level of increased customer conservation would be needed to make up the remainder of the projected shortage. Then the District held public meetings in February 1991 to brief customers on the water supply situation and hear their input on potentially stringent demand-reduction programs that included pricing disincentives and measures to limit waste and unreasonable use. District staff estimated that customers would need to reduce consumption by 35 percent.

By early 1991 it appeared that ACWD would receive only 20 percent of its imported State Water Project

supply. Worse, San Francisco authorities projected delivery of only 50 percent of requested supplies of Hetch Hetchy water. A dry February passed and then came March – with record rainfall. It was a temporary respite, but the Department of Water Resources was able to deliver 30 percent instead of 20 percent of ACWD's allotment, and San Francisco cut its Hetch Hetchy deliveries by only 25 percent rather than the feared 50 percent.

The drought still was not over. Three-fourths of California's population remained under mandatory rationing. The state established an Emergency Drought Water Bank, purchasing water allocations from water rights holders (such as farmers who would not plant part or all of their lands) and selling the water primarily to municipal water agencies. ACWD ultimately was able to purchase 14,000 acre-feet of water from the Emergency Drought Water Bank.

A condition for this emergency supply was that purchasers implement drought management programs aimed at reducing local water demand below normally projected 1991 water demand. After holding public meetings and incorporating community concerns, the District launched its conservation program May 1. Staff conducted consultations with customers who applied for higher allocations and also with customers who wanted help in using water more efficiently. The District even let customers who used less than their base allowance "bank" their unused water. In July 1991, after the District's drought management program had been in operation for two months, customers were using nearly 30 percent below their 1987 usage.



From prior droughts, ACWD had learned that buying extra water during dry years was expensive. The District previously had set up a Dry Year Contingency Reserve, and was able to apply that in Fiscal Year 1991-92 to keep costs for customers as low as possible. The reserve helped the District pay for the water purchased from the Drought Water Bank and helped make up the shortfall in revenues caused by decreased water use.

A near-normal amount of rain and snow fell in March 1992. By April, water supply conditions statewide and locally had improved to the point where the District opted not to participate in a second year purchase from

In 2014 California experienced an extreme drought. In January, Folsom Lake was so low that the water resembled a creek rather than a lake in some places.

Coping with Drought . . . Again

On January 17, 2014, Governor Jerry Brown declared a drought emergency in California. Two weeks later the state Department of Water Resources announced that ACWD and the other State Water contractors would receive no allocations – for the first time in the State Water Project's fifty-four year history. That day, the District asked customers to reduce their consumption by 20 percent.

Now, in the District's centennial year, California is experiencing the third year of a historic drought, which continues to break records. After 2013, reservoirs were at half capacity or less and groundwater basins and ecosystems were stressed state-wide. Following a summer of devastating fires in the state in 2014, wildfire risk remains high. In ACWD's service area, runoff is less than a third of its normal rate.

In October 2014, the National Drought Mitigation Center calculated that the entire state (even the wettest counties) was experiencing drought conditions and more than 80 percent of the state was in extreme to exceptional drought.

Because ACWD has learned from past droughts, the District can better anticipate supply and act accordingly. ACWD was able to carry over a

portion of its 2013 State Water Project allocation for use in 2014. As important, over many decades, the District has built a diverse water supply portfolio, which includes local groundwater, desalinated brackish groundwater, water set aside in a "groundwater storage bank" in the Central Valley (read more about that in the final chapter), San Francisco's Hetch Hetchy water supplies, and water transfer arrangements with Contra Costa Water District. State Water Project allocations for 2014 were revised later in the year and ACWD is receiving 5 percent of the annual allocation, but this supply is clearly the least reliable in the District's portfolio.

Out of previous responses to drought, ACWD now has tools to better estimate and manage demand. The District has quite a bit of experience with best practices in conservation and can quickly implement strategies to limit water use. ACWD also has excellent tools and advice for customers to meet conservation goals – and rebates for saving water. Whereas once all customers could do to make their households more efficient was put bricks and bottles in the toilet tank, they now can install ultra-low-flow toilets and showerheads, better aerators for faucets, efficient clothes washers and dishwashers, smart irrigation systems, and a variety of devices to capture and safely reuse water. ACWD offers free leak detection and water conservation kits. The District set a conservation example by planting drought-tolerant landscaping at its facility on Grimmer

Boulevard in 1985 and continues to demonstrate – through the use of xeriscaping – the responsible water use it is encouraging customers to adopt.

A continuing problem is the cost of drought. Despite the Dry Year Reserve, a severe drought will inevitably result in a shortfall in revenue because of reduced use as well as increased costs for water. In July 2014, the Board held a public hearing to discuss approaches needed to make up for the revenue losses. The Directors decided that by reducing operating expenses, deferring capital projects, and utilizing a \$10 million emergency/rate stabilization reserve to make up part

of the revenue shortfall, ACWD could substantially close the gap between revenues and expenses. The Board adopted a temporary drought surcharge that would make up the remaining difference between revenues and costs.

The current drought is rewriting the history of modern droughts in California. ACWD's Board, staff, and customers have met the challenge. During the summer of 2014, the conservation savings rate in the District was 24 percent, exceeding the targets once again because of the commitment of the residents and businesses in the Tri-Cities area.

Lake Oroville is the headwaters for the State Water Project, a valuable source of supply for ACWD. As of August 2014 it held only about 30 percent of its capacity.



the Emergency Water Bank. The District-wide conservation goal was reduced from 25 percent to 15 percent.

Some customers did not ease up on their conservation efforts and continued to work toward greater water use efficiency. New United Motors Manufacturing, Inc. (NUMMI), ACWD's largest single water user at that time, and Borden Chemical set new standards. By the end of 1992, NUMMI had achieved a 300,000 gallon-per-day permanent reduction in its water use, a savings of almost one-third of its total daily usage, and Borden Chemical had successfully reduced its consumption by 50 percent. The companies were among three California companies lauded by the state Local Government Commission for their efforts to permanently reduce the amount of water required in their production processes.

Despite the public's continued good conservation, plus better runoff during the preceding winter, water supply conditions by the fall of 1992 remained precarious. As of October 1992, State Water Project reservoirs held less than 50 percent of capacity. The state projected reduced allocations at 50 percent of the amounts requested by contractors unless winter conditions improved significantly. While the District braced for a possible seventh dry season, December arrived with a gift – the wettest winter month since 1986. The precipitation that fell that one month was enough to wash away six years of drought. By February 1993, the water content of Sierra snowpack was 175 percent of normal and state reservoirs had risen to 80 percent of normal or more. The drought was finally over.

Regional cooperation is a priority for ACWD. In 2014 the District forged a water transfer agreement with Contra Costa Water District, purchasing and storing water in their Los Vaqueros Reservoir (below). In the summer of 2014, ACWD withdrew the stored water, which comprised about 15 percent of the District's annual water supply.



The Drought Served as a Major Wake-up Call

While there were certainly negative economic and environmental outcomes from the droughts of the last one hundred years, drought also has brought about improvements and innovations in state and federal water project operations, water transfers, water banking, recycling, and the ability to purchase supplemental supplies.

Californians have learned about the vulnerability of their water supply and the need to conserve. A report from the Bay Area Water Agency Coalition in 2003 showed that residents in the San Francisco Bay Area's five most populous counties were using less water in the early 2000s than they did in 1986.

Something that helped bring this about was the development and implementation of a set of urban water conservation Best Management Practices (BMPs). These BMPs provided water savings estimates that urban water agencies could employ to realistically evaluate their conservation measures and pick the strategies that would work for them. At the end of 1991, a Memorandum of Understanding Regarding Urban Water Conservation was signed by representatives of more than 120 water agencies and public interest groups in the state.



ACWD was one of the original signers of the MOU, pledging to implement the BMPs that were locally cost-effective. Programs included public information; low-flow showerhead distribution; enactment of water-efficient landscape ordinances; large landscape, industrial, and residential water audits; and more. Water agencies can choose to implement the BMPs that have been proven to be cost-effective in areas with similar water supply costs and conditions.

In 2010 the District created a "Stop That Running Toilet" program to teach water conservation to students. The musical duo ZunZun (above) uses fun songs, unusual instruments, and audience participation to educate and inform. This program won the prestigious Clair A. Hill Water Agency Award for Excellence.



Before ACWD built its Water Treatment Plant #2 at Mission Boulevard and Interstate 680 in Fremont, they met with neighbors for more than a year to develop a plant that would be compatible with the neighborhood, addressing the facility's appearance, truck traffic, noise, types of processes, and use of chemicals. The District chose ozone to disinfect the water, reducing the use of chlorine by 75 percent.

Chapter 7 • Technology, Adaptation, and the Future

Water supply and water quality require even more creativity, innovation, and persistence in 2014 than in 1914 when the District was founded

When it comes to technology and innovation, ACWD always has been an “early adopter.” This approach has paid off in big benefits and often savings for customers.

ACWD has been making the case with science since its first engineer, Cyril Williams, mapped and studied more than 600 wells in Washington Township to establish a hydrological connection between Alameda Creek flows and the Niles Cone Groundwater Basin. That effort helped the District get back rights to local water in the 1920s.

The District has had many “firsts” with modern applications of science and technology. When it was built in 1969, the Manuel J. Bernardo Water Softening Plant was the world’s largest continuous countercurrent ion-exchange water softening plant. Used to “soften” the mineral-rich water from the Peralta-Tyson and Mowry wellfields, the plant reached the end of its useful life in the 1990s. The District then built a new facility that would achieve an even larger objective – water that had uniform aesthetic qualities.

The District’s water at that time came from three different sources: groundwater, which was softened; surface water, which was treated at the Mission San Jose Water

Treatment Plant; and water from San Francisco’s Hetch Hetchy system. Each one of those “products” had a different taste. Customers received water from each source at different times of the day, and they didn’t like the variation.

The solution was to blend groundwater with Hetch Hetchy water to match the hardness of the water from the

The ozone used at Water Treatment Plant #2 requires electricity. The District constructed a hydroelectric facility at the plant, which generates enough energy for the entire plant.



shallow aquifer could be flushed out during wet years, the water in the deeper aquifers was trapped. ACWD began pumping out the salty water and sending it back into the Bay in the 1970s.

After much study, ACWD decided to use reverse osmosis technology to desalinate the brackish water, which has about 10 percent of the salt content of sea water. The desalination facility was the first plant of its kind to be constructed in Northern California.

To save money on the plant, the District built it in Newark close to one of the flood control channels where the District already had permits to discharge salty water that was being pumped out of the aquifers. By siting the facility near both the source of supply and the point of discharge, ACWD didn't need to install a lot of expensive pipeline to move the water. To further reduce costs, ACWD built energy recovery facilities into the plant's operations. In 2014 the desalination plant produced water at approximately half the cost per acre-foot than the District paid for supplies purchased from the San Francisco Regional Water System. Best of all, it's a reliable source of supply, even during droughts – unless groundwater levels drop too low. If that happened, desalination operations would be limited.

ACWD expanded the plant in 2010 so that now it has a capacity of more than 12 million gallons a day. Because the water produced is completely under local control, the expanded desalination facility plays a critical role in guaranteeing a dependable water supply for the Tri-City area.



Even better – the reverse osmosis technology produces very high-quality water. And the leftover brine? State and federal fish and wildlife agencies determined that the Bay's habitat would actually be enhanced by the discharge.

Not all of the District's innovative ideas were as successful as the Newark Desalination Facility. ACWD still struggles with an upgrade to the Mission San Jose Water Treatment Plant, which treats water from the Central Valley via the South Bay Aqueduct. When ACWD

Snowmelt from the Sierra Nevada travels down the mountains and through the Delta river system, where it picks up agricultural pesticides and organic materials. Chemicals commonly used to treat water react with the organic materials and require the District to find more sophisticated ways to treat Delta water at the Mission San Jose Water Treatment Plant.

Innovation Boosts Steelhead Trout Recovery

Alameda Creek once supported a run of steelhead trout. Even as ACWD was starting, the steelhead fishery was declining, in part because of impassible barriers (such as low, concrete dams) that had been placed in the creeks and streams throughout the watershed. These

barriers prevented the steelhead from migrating from freshwater streams to the ocean – and then back again to lay eggs. In the 1950s, the California Department of Fish and Game concluded that a viable steelhead fishery no longer existed in Alameda Creek.

In the late 1980s, however, a variety of groups wanted to reestablish steelhead here. The District already had a rainbow trout program in Alameda Creek and was interested in helping. Restoration efforts, however, would require coordination among multiple

agencies and no one stepped forward to take the lead. The idea drifted.

A decade later three things happened:

1. Steelhead were named a threatened species in Northern California,
2. During the heavy winter rains of 1996-97, steelhead began to appear in Alameda Creek, and

3. A coalition of fishermen, environmentalists, biologists, and recreationists formed the Alameda Creek Alliance to help restore the steelhead fishery.

Restoration efforts picked up in 1999. ACWD was realistic about the project: good science needed to be the foundation of resource decisions. The District wanted to balance environmental concerns with its mission to provide area residents with a reliable supply of high-quality water at a reasonable cost.

In short order, six state and federal agencies, three stakeholder groups, and several public agencies and local companies teamed up in the effort. Just as important, seventeen public agencies and nonprofit organizations agreed to collaborate on a study of stream flows and fish habitat needed for the restoration effort.

After extensive research determined that restoration of a steelhead trout population in Alameda Creek was feasible, the project partners (including the East Bay Regional Park District, with whom ACWD had developed Quarry Lakes Regional Recreational Area) removed barriers in the upper watershed. The District did the same in Alameda Creek below Niles Canyon.

The District sought grants to help defray costs because the project had an impact far beyond the boundaries of its service area, addressing statewide and national concerns. ACWD received two separate grants to

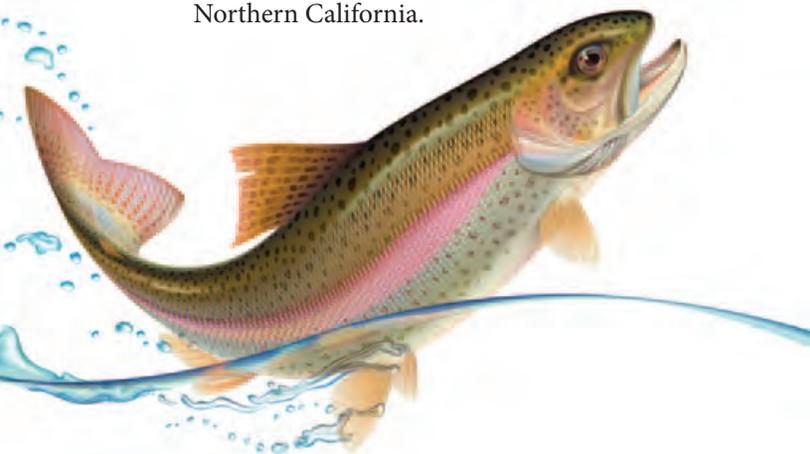


The District won grants to help defray costs of the steelhead trout restoration efforts. One grant helped pay for fish screens on Alameda Creek to keep juvenile steelhead from being carried into groundwater recharge ponds.



install fish screens to keep juvenile steelhead from being carried into groundwater recharge ponds. As part of the project, ACWD decommissioned Rubber Dam No. 2 (in operation since the 1970s) and didn't replace it. Instead, the District created a fish passage in the rubber dam's concrete foundation. ACWD is also working with Alameda County Flood Control District to create a fish passage over the concrete erosion control structure located beneath the BART bridge over Alameda Creek, and another over Rubber Dam No. 3. ACWD even worked out a plan to rescue any migrating steelhead trapped below the BART weir.

This project has been a win-win-win. ACWD not only has made and continues to make decisions to ensure that the water flows protect customers' interests, the District also has extended the practice of regional cooperation into multi-stakeholder cooperation. ACWD secured grants to defray costs to customers. And the District is helping a threatened species regain some of its historic territory in Northern California.



upgraded the old plant, it chose to use ultrafiltration treatment membranes. The plan was that these filters would remove organic and inorganic matter, and that meant fewer chemicals would be added to the water, resulting in fewer byproducts from disinfection. The plant was designed to be operated remotely to bring down costs even more.

Small-scale pilot testing was successful, but when brought online, the plant's filters plugged up rapidly. Cleaning the filters was time consuming, and the cleaning process accelerated filter breakdown. Instead of minimizing operator involvement, the plant increased it. Zone 7 Water Agency in Livermore also tried ultrafiltration based on the same pilot test results, and they experienced similar problems. This was the first time ultrafiltration was attempted on Delta water.

Delta water picks up farming chemicals and organic materials as it flows from the Sierra through the Central Valley. Cleaning up this water has become more complicated in the last few decades, and while treatment meets or surpasses all state and federal health standards, ACWD still has not been able to run the plant at its designed capacity. The District continues to work on ways to boost production at this plant. The plant, however, has achieved a national Director's Award from the Partnership for Safe Water for fifteen straight years for not only surpassing federal standards, but also for constantly working toward improved water quality.



Ultrafiltration at Mission San Jose Water Treatment Plant is one of many ways the District works to improve water quality. For fifteen years the plant has achieved a national award from the Partnership for Safe Water for surpassing federal standards.



Quarry Lakes has expanded ACWD's ability to recharge its groundwater basin. The District continues to look for additional approaches and new arrangements to expand its "water portfolio."

Chapter 8 • Where do we go from here?

Increasing water supply and the reliability of the delivery system take on greater meaning and importance going forward

ACWD successfully weathered its first one hundred years because members of the community stepped forward and contributed their remarkable foresight, leadership, and innovation to this water district. Over the course of ten decades, these community leaders – the District's Directors – proved themselves to be excellent stewards of the District's water resources by focusing continuously on their desire and duty to serve this community.

The next one hundred years will be no less challenging. One of the ways the District intends to meet the challenge is through careful planning. In 1995 ACWD instituted a new type of planning system because of increasingly complex issues facing water providers: new risks, regulations, supply uncertainties, changing land use, growth in population and demand, and many other factors. Called "Integrated Resources Planning," the approach accounts for these changing variables.

This type of planning helped the District make good choices to meet demand, contain costs, and improve water supply reliability while maintaining water quality standards. Below are some accomplishments stemming from the Integrated Resource Planning.

Demand management: ACWD implemented cost-effective conservation measures focused on reducing outdoor water use. The target was 2,900 acre-feet a year savings by 2020, yet by 2012, the District estimated that active conservation (achieved as a direct result of the District's conservation programs) had permanently reduced demand by 3,600 acre-feet per year. The District anticipates additional permanent reductions in demand from conservation program activity initiated during the 2014 drought.

Increase supply: The impact of the desalination effort cannot be understated. The District converted the salty water it had previously pumped out of the aquifers into high-quality water. The planning goal was to reclaim 8 million gallons a day by 2010. Yet by 2010, the plant was producing 10 million gallons a day, and now has a total blended capacity of 12.5 million gallons a day. Desalination has increased ACWD's water



ACWD's General Manager Robert Shaver and board member Jim Gunther tour the Newark Desalination Facility. The plant has a capacity of 12.5 million gallons a day.

supply reliability by reducing dependence on water imported from the Delta.

Another big step forward in the efforts to increase supply was creating dry-year storage, a way to store water that could later be tapped and used to stretch supplies in dry years. It took a change in state water policy in the 1990s to allow ACWD to store water outside the service area. After much research, the District determined that groundwater “banking” was a great

alternative and that Semitropic Groundwater Banking Program in Kern County best met ACWD’s needs. ACWD delivers wet year and surplus State Water Project allocations to the “bank” and then is able to receive a pre-determined amount of Semitropic’s state allocation in dry years. In 1997 the District purchased 50,000 acre-feet of storage capacity and was later able to increase that to 150,000 acre-feet. That is enough water for the entire service area for three years. By 2014, ACWD had moved more than 110,000 acre-feet

Quarry Lakes Regional Recreation Area in Fremont is one of the more recognizable features of the area that once was called Washington Township.



of water to Semitropic through the California Aqueduct and is withdrawing approximately 14,000 acre-feet of that reserve this year.

Groundwater management: To protect the aquifers from more salt water intrusion, the goal was to keep the local water table from never dropping lower than five feet below sea level, even during a drought. Now, because of Quarry Lakes groundwater recharging operations, the District has been able to maintain the water table above sea level.

Ensure water quality: This effort has included treatment plant upgrades, such as capacity expansion at Treatment Plant No. 2 (at Mission Blvd. and Interstate 680) to 23 million gallons a day. Through blending water, the District also has met another water quality goal of avoiding large fluctuations in water hardness.

Contain costs and maintain low average customer bills: ACWD avoided having to spend tens of millions of dollars in capital costs through such choices as the blending facility (its success meant the District did not have to build a new treatment plant) and the desalination facility (which means ACWD needs to purchase less of the more costly Hetch Hetchy water).

Looking Forward

ACWD is taking steps to make the Tri-City area's water future more secure. This includes preparing for crises, upgrading the system, and looking for ways to improve reliability and reduce reliance on imported water supplies.

A potential next step is a project with Union Sanitary District to produce new water for landscaping and industrial use by treating and reusing wastewater produced locally. Presently the District is installing new, separate pipelines to deliver the recycled water to customers such as industrial parks for watering medians and other non-drinking water uses.

ACWD is looking to engage in more regional cooperation to maximize resources and increase water supply reliability. For example, seismic upgrades throughout the region, not just within the District, will create significantly more protection in a major earthquake. Another example (discussed earlier) is water transfers with other water districts in the region. ACWD also intends to increase conservation efforts beyond the current drought, and will continue to identify more ways to increase water savings.

An ongoing effort is to explore more cost-savings as water becomes more expensive to purchase and produce. Some examples of how the District is doing that include refinancing old debt at lower interest rates, employing technology that reduces costs and/or eliminates the need to build expensive treatment facilities, teaming up with Union Sanitary District to get the best possible rate on bonds, and securing grants for conservation or environmental projects of regional significance – such as the steelhead restoration project.



Seismic upgrades at the Alameda Siphons, part of San Francisco's suburban water system, increases the region's protection from a major earthquake.

Preparing for Emergencies and Disaster

The Hayward Fault bisects ACWD's entire service area. In a major earthquake, customers in the service area could be without water for months. The District established a goal to significantly reduce the time it would take to return to normal service after a catastrophe, then set about making that possible.

ACWD began a long-term program to strengthen the entire system in the late 1990s. Efforts included installing emergency electric generation at well-fields, seismically upgrading reservoirs and tanks as well as the Mission San Jose Water Treatment Plant and the water quality laboratory at the District headquarters building. The Newark Desalination Facility was part of this program, for it can provide a source of supply for residents and businesses to the west of the Hayward Fault. Most of the District's water production facilities

are east of the fault, and delivery could be affected in an earthquake.

ACWD worked with the California Department of Water Resources and the Santa Clara Valley Water District to install a 48-inch isolation valve on the South Bay Aqueduct just below the Mission San Jose Water Treatment Plant. If there

is a break in the pipeline downstream from the plant, crews now can shut off the flow so that the region does not lose massive quantities of water.

In 2012, the District accelerated a planned \$18.5 million seismic strengthening project. The first projects undertaken improved the reliability of fifteen large pipelines (ranging from 12 to 48 inches in diameter) which cross an 8.5-mile section of the Hayward Fault in Fremont and Union City. This project should improve ACWD's ability to move water across the fault after a major seismic event and also restore service to customers more quickly.

The seismic upgrades dovetail with a long-term water main replacement program. A large portion of the District's 900-mile system was built during the period of very rapid growth in the 1950s to 1970s. This "mid-century" system is reaching the end of its useful life, and failures are anticipated beginning around 2025 if nothing is done to upgrade them. Without action, the District projects it could have about 2,000 leaks a year by 2040. Emergency response because of those leaks would cost \$15 million a year in today's dollars. By 2050 the estimate is nearly 5,000 leaks per year with a \$38 million annual repair cost.

ACWD cataloged the system by age and location. Staff identified the areas that would be severely affected by water main failures (for instance, older water mains



ACWD seismically strengthened the large mains that cross the Hayward Fault so that they will be more reliable in an earthquake. In areas where earth movement may be significant, the District is installing special valves and flexible tubing (shown above) at the fault crossing to provide ready-made bypasses around sections of pipe that may be damaged.

that crossed major fault lines). Then the District started systematically replacing pipelines to avoid the disruption to customers and the significant costs of emergency response to breaks and failures. The District is replacing 5 to 7 miles of water mains each year. This program will extend through 2090.

Together, the seismic strengthening and water main replacement programs will significantly increase ACWD's ability to return customers to normal service after an earthquake or other disaster. The 2008 seismic vulnerability analysis projected that 70 percent of customers could be returned to service within 50 days of a major earthquake on the Hayward Fault and 100 percent within 220 days. ACWD already has more than halved that. With the projects scheduled to be completed by the end of 2014, the District now estimates that 70 percent of customers will be returned to service within 10 to 20 days, and 100 percent within 40 to 100 days.



Seismic upgrades go hand-in-hand with maintenance and a systematic replacement of aging water mains.

Another challenge is to adapt to changes in the District's operating, regulatory, and financial environment. In 2011 ACWD asked employees for ideas to reduce costs and improve the quality of service. The District implemented the best of those suggestions and by mid-2014 has seen \$500,000 in combined savings and revenue increases. Over the next ten years, ACWD anticipates \$8 million in savings and revenue increases stemming from these new approaches.

As ACWD makes its entire system more reliable for current customers and future generations, it also needs to find ways to pay for ongoing and new projects. ACWD will not rely on increased water consumption to pay the bills. Per capita water consumption dropped 32 percent between 1997 and 2010, and that's a trend that will continue.

Today, the District's water commodity rate is in the bottom half of thirty Bay Area water agencies, and ACWD will find ways to streamline operations, employ new technologies, and take advantage of opportunities that arise to not only provide reliable, high-quality water to customers, but to do so at a reasonable cost.

The future is filled with challenges, but also opportunities – producing more usable water through desalination and recycling, sharing resources with other agencies in the region, and advancing environmental



For almost 100 years, the Alameda County Water District has supplied water to the residents and businesses of southern Alameda County. Today, ACWD brings drinking water to more than 339,000 people living in Fremont, Newark, and Union City.

goals while protecting water quality and supply. ACWD is strategically replacing or strengthening pipelines and plants so that they provide more reliability as they age, and perhaps as they experience seismic activity.

Whatever the future brings, the District and its Board will embrace it and find the best solutions for all customers and the area's water future as did those who guided this District through its first one hundred years.

The development of Quarry Lakes expanded the District's ability to store and percolate water, which is essential not only to meet local demand, but also for drought preparedness.



A Thank You to ACWD's Directors

Dedicated community leaders have taken the helm of the Alameda County Water District since it was formed in 1914. They fought for water and secured water rights for the District and its residents. They had the foresight to anticipate changing demands and the courage to make some tough choices along the way. They tried new approaches to old problems, insisted on doing more with the District's existing resources, and guided ACWD's course through flood, drought, and continuous change in water use and policy. Working with a dedicated and committed staff, their service to the community has benefitted all the cities of historic Washington Township, and all the water users in this complex system.

Joseph C. Shinn, 1914 - 1942

E.H. Stevenson, 1914 - 1930

William Trenouth, 1914 - 1932

Emmanuel George, 1914 - 1941

William D. Patterson, 1914 - 1958

George P. Lowrie, 1930 - 1938

E.M. Grimmer, 1932 - 1956

Frank T. Dusterberry, 1938 - 1944

Louis S. Amaral, 1941- 1956; 1958 - 1964

Manuel Bernardo, 1942 - 1966

Jack Prouty, 1944 - 1957

John G. Pihl, 1956 - 1960

Keith Whipple, 1956 - 1958

George D. Latham, 1957 - 1962

Bernie R. Joseph, 1958 - 1959

Ralph Logan, 1959 - 1962

William F. Humpert, Jr. 1960 - 1966

Tony Alameda, 1962 - 1969

Frank Borgi, 1962 - 1992

Clark W. Redeker, 1964 - 1995

Harry Brumbaugh, 1966 - 1990

John Gomes, 1966 - 1979

Carl H. Strandberg, 1969 - 1995

Joseph Damas, 1979 - 2001

Tim Rollisson, 1990 - 2000

Philip J. Utic, 1992 - 1998

Jim Gunther, 1995 -

John Weed, 1995 -

Arthur Lampert, 1998 - 2009

Marty Koller, 2000 -

Judy Huang, 2002 -

Glenn Reynolds, 2009 - 2010

Paul Sethy, 2010 -

General Managers

1914 - 1933 Cyril Williams, Jr.

1933 - 1953 E.A. Richmond

1953 - 1977 Matthew P. Whitfield

1977 - 1982 Stanley R. Saylor

1982 - 1987 Roy E. Coverdale

1987 - 1997 James D. Beard

1997 - 2009 Paul A. Piraino

2009 - 2014 Walt Wadlow

2014 - Robert Shaver

Acknowledgments and Photo Credits

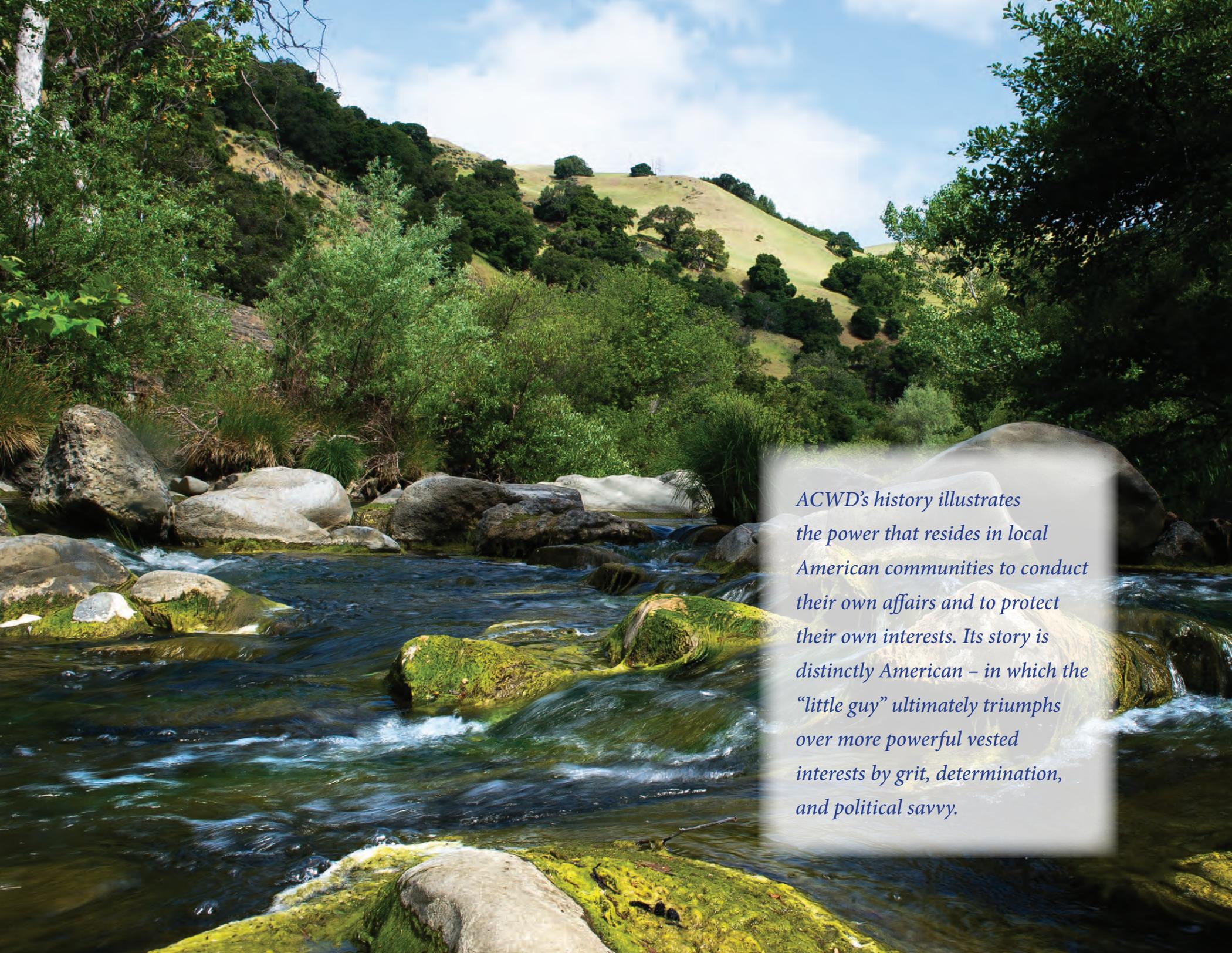
This book's author, Penny Hill, collaborated Paul Piraino to tell ACWD's centennial story. Paul was ACWD's General Manager from 1997 to 2009, and portions of this book are based on his book, *Our First 100 Years, A Comprehensive History of the Alameda County Water District*.

Many people contributed to this book, especially Patricia Schaffarczyk of the Museum of Local History in Fremont, who went the extra mile to locate and suggest photographs and other materials to illustrate the District's history. Janet Cronbach at the Maurice Marks Center for Local and California History at the Fremont Main Library uncovered valuable background materials for this book. ACWD's Sharene Gonzales, Stephanie Penn, and Frank Jahn contributed their time and creativity to collect and provide photography for this book. In addition to photos from Alameda County Water District's historical files, additional photography was provided courtesy of the following organizations:

Cover: Quarry Lakes by Stephanie Penn

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| 3: U.S. Geological Survey. Inset, <i>Western Journal of Education</i> | 30: Alameda County Water District, Stephanie Penn |
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| 10: San Francisco Public Utility Commission | 36: Alameda County Water District, Stephanie Penn |
| 11: Alameda County Water District, Frank Jahn | 37: Alameda County Water District, Stephanie Penn |
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| 14: San Francisco Public Utility Commission | 40: Alameda County Water District |
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| 17: Alameda County Water District | 44: Contra Costa Water District |
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| 19: Top, Museum of Local History in Fremont; bottom, Alameda County Water District, Stephanie Penn | 46: Alameda County Water District |
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| 21: Alameda County Water District | 48: Alameda County Water District |
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| 24: Alameda County Water District | 51: Alameda County Water District, Frank Jahn |
| 25: Alameda County Water District, Frank Jahn | 52: Alameda County Water District |
| 26: Alameda County Water District | 53: California Department of Water Resources |
| 27: Alameda County Water District | 54: Alameda County Water District |
| | 55: San Francisco Water, Power and Sewer |
| | 56: Alameda County Water District |
| | 57: Alameda County Water District |
| | 58: Alameda County Water District |
| | 60: Alameda County Water District, Stephanie Penn |



ACWD's history illustrates the power that resides in local American communities to conduct their own affairs and to protect their own interests. Its story is distinctly American – in which the “little guy” ultimately triumphs over more powerful vested interests by grit, determination, and political savvy.