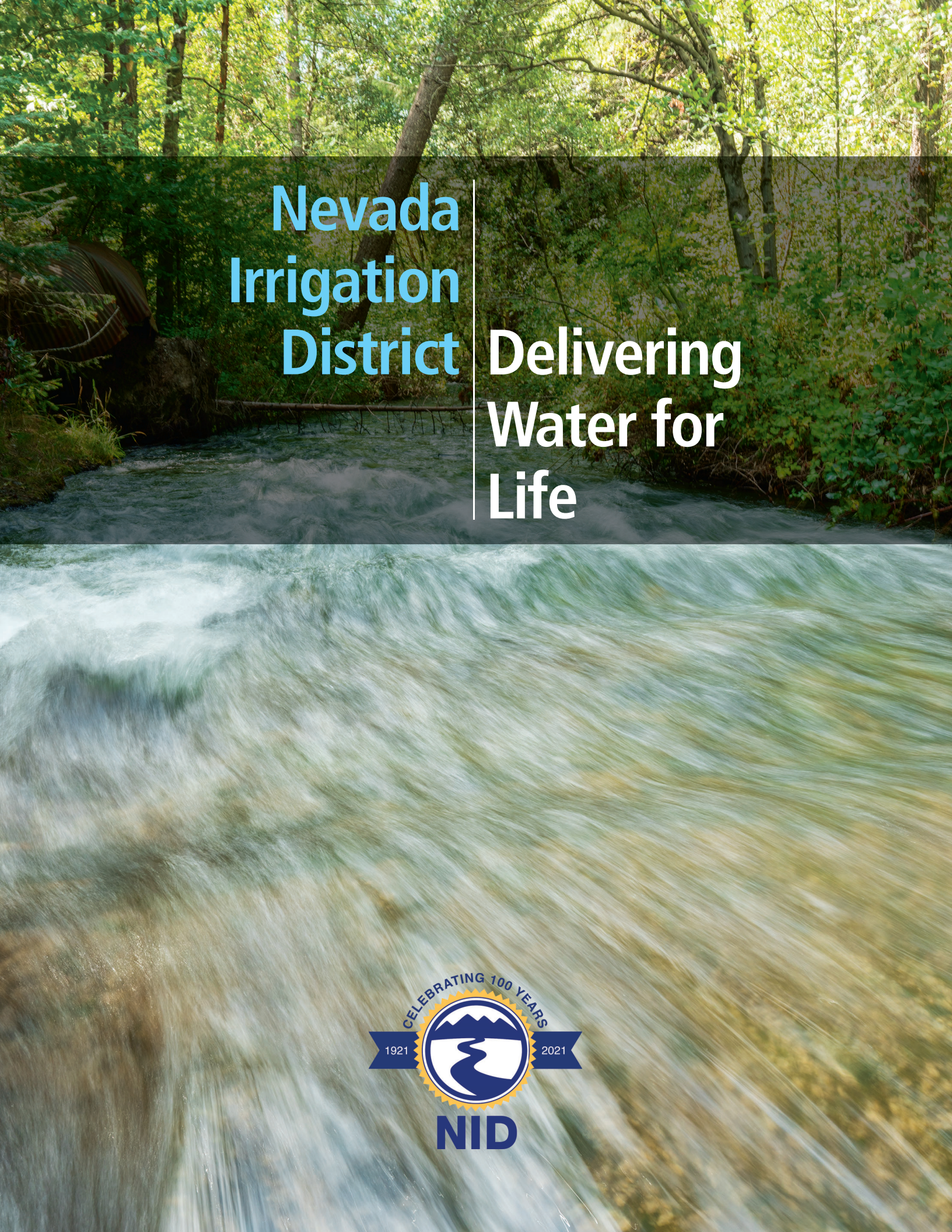

Nevada Irrigation District

Delivering Water for Life

CELEBRATING 100 YEARS
1921 2021
NID

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Preface

Jennifer Hanson
NID General Manager

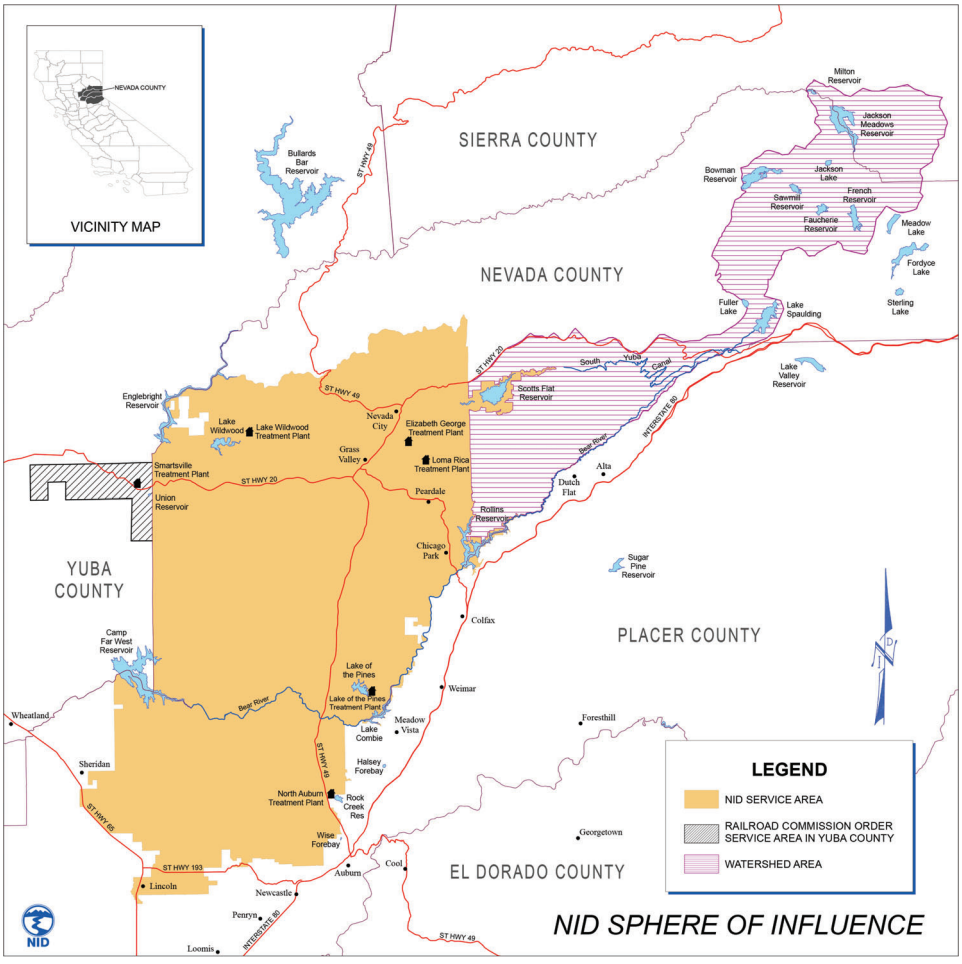
The Nevada Irrigation District (NID) is a prime example of how vision and resolve by a community – local farmers, ranchers and average citizens – to secure a dependable water source manifested in the creation of California's second largest irrigation district (by geographical area). NID has served the community for 100 years and will continue to provide high quality Sierra Nevada water for generations to come.

This book celebrates NID's history and the innovative, bold steps it took throughout a century to ensure the communities of the Sierra foothills are guaranteed a reliable supply of water for farms, fields, households and businesses.

The story of NID is a chronicle of foresight, grit and responsiveness. It's been a fascinating journey that will continue to play out for decades to come. Throughout the District's history, the intention has been constant: provide fresh, clean water and reliable water to the Sierra foothill communities in Nevada, Placer and Yuba counties. That has been NID's mantra, and will continue to be well into the future.

Enjoy the story of the District's first 100 years.

Board of Directors



Chris Bierwagen
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Director

Introduction

French Lake

It was a dream come true for local farmers and community visionaries to tap the pure snowmelt of the high Sierra Nevada mountain range to water their lands in the drier foothills. Since its formation 100 years ago, the Nevada Irrigation District, known as NID, has had one mission: to provide the people of the Sierra foothills with high-quality water for their farms and fields and, later, their homes and businesses.

Today, more than 200 NID employees work hard to meet the District's commitment to deliver water to the communities in Nevada, Placer and Yuba counties. The District owns and operates an extensive reservoir and canal system and a network of water treatment plants. It also generates renewable hydroelectric energy and provides public recreation at campgrounds and reservoirs.

The California Gold Rush in 1849 put the Sierra foothills on the map around the world, as the hope of striking it rich drew more than a hundred thousand prospectors to stake their claims. The new towns of Grass Valley and Nevada City grew quickly to support the influx of miners, and Penn Valley was established, thanks to its location on a wagon route between mining regions and Sacramento to the west. To the south, towns in Placer County served as important passageways to the Gold Country.

Agriculture thrived, initially to provide food to the miners, and later as many decided to settle in the area to farm and ranch. In addition, the large and very lucrative hard-rock mining operations around Nevada City and Grass Valley provided jobs, boosted the local economy and established permanent communities. This created an increased need for a reliable water supply. Depending on groundwater from early wells or purchasing water from private companies established after the Gold Rush was not a viable long-term solution for foothill residents.

The idea for forming a local, publicly operated irrigation district was established in 1917, when

NID provides water to irrigate pastures.

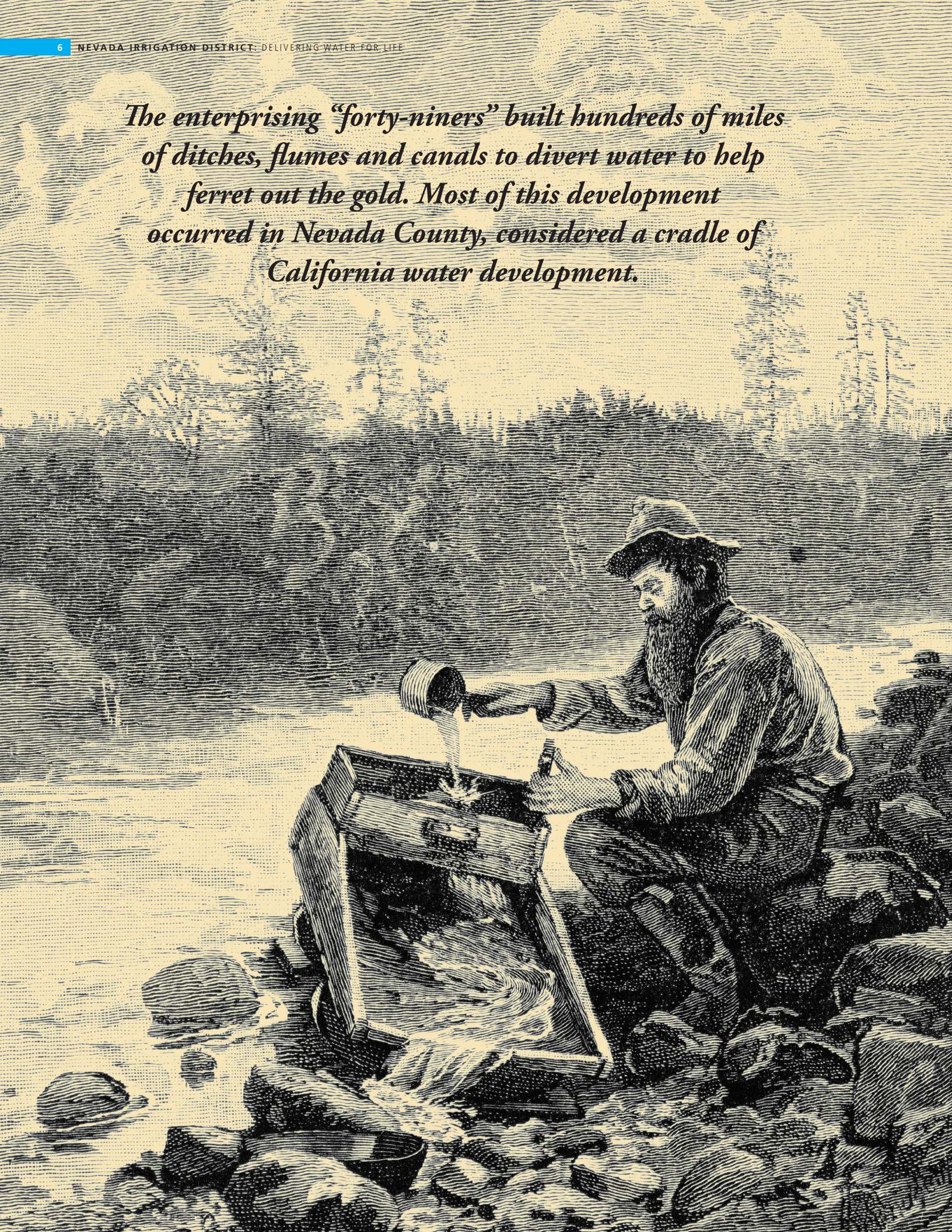
Bert and Kate Church drove their cattle from parched dry pasture in western Nevada County up to the green mountain meadows of the Sierra Nevada. They envisioned a water system where the abundant waters of the mountains could be carried to the fertile but dry farms and ranches at the lower elevations. In 1921, the dream became a reality when Nevada County voters overwhelmingly approved the foundation of an irrigation district. Five years later, in 1926, residents of Placer County chose to join the District, and the boundaries expanded to include nearly 270,000 acres. NID began to deliver irrigation water to local farms in 1927, using many of the existing reservoirs and old canal systems built during the Gold Rush. The cost to customers at the time was about 10 cents a day.

Today, the District still depends on the snowpack on 70,000 acres of mountain watershed as the source for both treated drinking water and irrigation water to supply nearly 25,000 customers in Nevada, Placer and Yuba counties. Also, NID has been a leader in the state in using water flows to produce clean hydroelectric energy since the 1960s. The District's seven power plants generate enough electricity to supply the equivalent of more than 60,000 homes.

NID operates reservoirs that store the precious water and offer outstanding outdoor recreational opportunities. In the Sierra foothills, Rollins and Scotts Flat reservoirs feature campgrounds, day-use beaches and facilities where guests can enjoy fishing, water skiing, sailing, kayaking and swimming. In the higher elevation mountains, Jackson Meadows features several campgrounds, picnic day-use sites and boat ramps. Other campgrounds are located at Bowman, Canyon Creek, Sawmill and Faucherie reservoirs in the Bowman corridor.

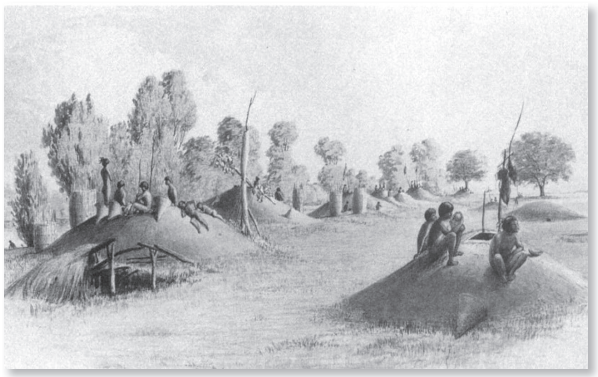
For 100 years, the men and woman of NID have dedicated themselves to keep high quality water flowing to farms and fields, households and businesses; and the foothill communities have prospered and quality of life enhanced. Leading into the future, the mission remains the same: NID stays committed to putting the community water needs first. We pledge to carry on our legacy to deliver water for life. ■

The enterprising "forty-niners" built hundreds of miles of ditches, flumes and canals to divert water to help ferret out the gold. Most of this development occurred in Nevada County, considered a cradle of California water development.



CHAPTER 1

The Gold Rush Brings Early Water Development



The Nisenan people lived alongside the natural waterways of the foothills long before the Gold Rush.

The Sierra Nevada foothills have prospered under the sun's warmth in summer and the grace of mild snow in the winter. Pine and fir trees reach down from the higher mountains to mix with woodland blue oaks, gray pines and the chaparral in the lower elevations. During spring, the meadows burst with color from native flowers. And black bear, bobcat, mule deer and skunk romp in their native habitat in the temperate climate.

More than a thousand years ago, Native Americans lived harmoniously beside the flowing rivers and abundant streams and creeks in the region. These waters, fed by snowmelt higher up in the Sierra, provided the local Hill Nisenan – the name derived from the meaning "from among us" – with ample supplies throughout the year. The climate was mild; the land was green and fresh, and waters bountiful. These people lived simply, and nature provided.

The office of Coyote and Deer Creek Water Company in the early 1850s was located in Nevada County. This was one of the earliest of the 520 corporations that later became part of PG&E.

The earliest known California water systems can be traced to indigenous tribes as far back as A.D. 800. The Hill Nisenan people were drawn to the Yuba River, Bear River and tributary streams for their life supply; and they carved ditches and waterways to nourish their settlements. These native people built their small communities along waterways, depending on acorns, seeds and wild game for their food source. Before the California Gold Rush, an estimated 7,000 Nisenan lived in natural harmony with the watershed.

The 1848 discovery of gold by James Marshall at Sutter's Mill, located on a bank of the South Fork American River in Coloma, changed everything. When the second major gold strike occurred in the Auburn Ravine five months later on May 16, 1848, the rush was on. California didn't become a state until September 9, 1850, yet once gold was scooped from the riverbeds, instantly people rushed in from all over the world headed for the California foothills to strike it rich. By 1849, an estimated 100,000 newcomers had arrived, permanently transforming the territory. For the Nisenan, it meant decimation of a culture, and the population declined rapidly. For the gold miners, known as "forty-niners," the foothills of the Sierra Nevada promised a prosperous future.

Settling the foothills with the lure of gold

The Auburn Ravine discovery, and subsequent settlement by miners, eventually became the city of Auburn. To the north, Nevada City (known as Caldwell's Upper Store, Coyoteville and Deer Creek Dry Diggings before simply Nevada in the 1850s) was originally a mining camp founded along Deer Creek, where the first gold was found in the area. The settlement rapidly became a proper town, at one point boasting of being the third largest city in California with a population of 10,000. A few miles away, near today's Grass Valley, gold was first found in Wolf Creek in 1848 shortly after Marshall's discovery. The settlement was initially known as Boston Ravine and then Centerville, before the town of "Grass Valley" was incorporated on March 13, 1893.

Prior to 1850, there were no engineered water systems in the Sierra foothills. In the beginning of the Gold Rush, prospectors collected gold using simple panning techniques in the natural flows of the creeks, streams and rivers. The easy pickings were soon gone, however, and miners graduated to placer mining, using extended wooden boxes called "cradles," "rockers" and "long-toms" to filter out the gold from larger

volumes of gravel using water diverted from the waterways. Water was valuable because it was the means to separate gold from the earth.

The enterprising "forty-niners" built hundreds of miles of ditches, flumes and canals to divert water to help ferret out the gold. Most of this development occurred in Nevada County, considered a cradle of California water development.

The importance of these man-made conduits cannot be overstated: "One of the most important agents in developing the resources of (Nevada County) has been the water introduced from natural streams by means of ditches," wrote W.B. Lardner in his 1924 *A History of Placer and Nevada Counties California*. "During a large part of the year the business of the region must utterly fail were it not for these artificial streams that compensate in a great measure for the drought of the summer season, and enable the miner to pursue his calling. The ditching operations have been generally so profitable to the projectors, and so indispensable to the mining interest, that they now net nearly the whole county. Where good diggings are opened, some enterprising men cast about for a supply of water, and spare no labor to conquer the many obstacles which are presented by a rough, thinly settled country."

For example, in 1850 a determined man only known in history archives as "Moore" began construction of the Rough and Ready Ditch, from Deer Creek above Nevada City to the boom town of Rough and Ready, with a peak population of 3,000 in the 1850s. Deemed a "lunatic" by the locals for attempting such a feat, Moore wasn't daunted, got to work and dug for a mile. In the spring of 1851, A.L. Williams and B.O. Williams took up the quest and finished the 13-mile long conduit, which became the state's first large-scale mining ditch. Interestingly, the Nevada Irrigation District still uses part of the ditch today.

Also in 1850, four Nevada City miners – Charles Marsh, Thomas and John Dunn and William Crawford – dug the Rock Creek Ditch that conveyed water nine miles from Rock Creek, above Nevada City, to the mining camp known as Coyote Hills, or Coyote Diggings, near Sugar Loaf. The ditch took four months to build at a cost of $10,000, and was bringing water to miners by December of that year. "This was the first large ditch in successful operation in the county, and produced great results," Lardner wrote. "Before that time the pay dirt taken from the Coyote lead had all to be hauled in cars to Deer Creek, at the foot of the town, at great expense: and piles of dirt had been left near the shafts on the hills, as useless, because it would

What is a miner's inch of water?

A legacy of the Gold Rush, a miner's inch is a simple, efficient way to measure the amount of water received from a ditch or canal.

The backstory is that gold miners needed water to work their claims. Many companies arose to build ditches, flumes and canals to tap the Sierra water and transport it to the thousands of mining claims and sites. The question was how to fairly distribute and charge for the water?

This elementary solution measured an allotment of ditch water using a fixed hole size with a fixed amount of "head" pressure to give a constant and easily verifiable measure.

One miner's inch is delivered from a ditch or watercourse by making a hole or orifice in a board weir that equals 1 square inch with the water in the ditch 6 inches above the center of the orifice.

There were some variations in the early days, but the one method recognized to this day in the California Water Code will deliver 1.5 cubic feet per minute, which equals 11.22 gallons per minute. Six miner's inches would be an orifice that measures 6 square inches (2x3 inches or 1x6 inches).

It was simple and accurate; and a shining example of how an innovation from a bygone era can endure the test of time to be standard practice for the past 170 years.

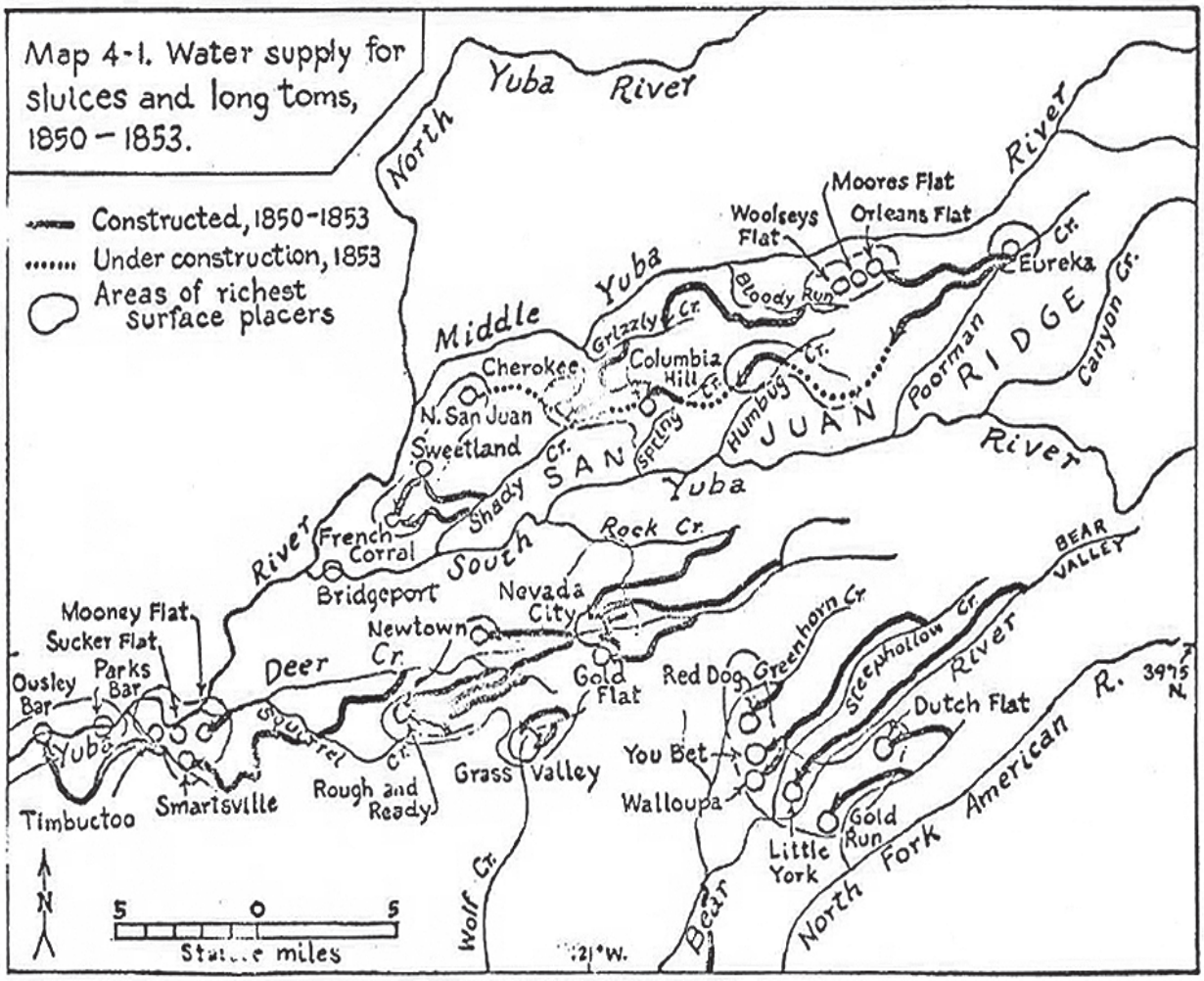
not pay to be hauled for washing. These piles of dirt now became valuable, as the water flowed by them, and thousands of dollars were washed out of them."

Construction began in 1854 on an even-larger conduit, the Snow Mountain Ditch, with a capacity of 150 miner's inches, for a cost of $360,000. Water was sold to miners for $1 per miner's inch. Thanks to the water-hungry forty-niners, business was so brisk that construction costs were recovered within six weeks.

At the same time, William Harrison Folsom, who hailed from Portsmith, New Hampshire, where he was an architect and contractor, traveled in 1849 to the Sacramento area and then to the town of Rough and Ready where he worked on water projects for the gold miners. As an architect he designed a 9-mile-long canal from Deer Creek to a hydraulic mine near what today is Scotts Flat Reservoir and downstream to Coyote Diggings. Folsom got financing from a group of powerful San Francisco businessmen who became associated with the Spring Valley Water Company, which went on to hold a monopoly on water rights and became the major water supplier to San Francisco from 1860 to 1930.

Folsom wrote in his diary: "I went to Rough and Ready and went to mining and from there I went to Coyote Diggings. And in the spring of 1851, I organized the Deer Creek Water Company and we built a ditch nine miles long, one of the first enterprises of that kind in the section. I was one of the proprietors and superintendent of the work."

Flumes were the primary ways to move water through the District.



Water Map 1850-1853

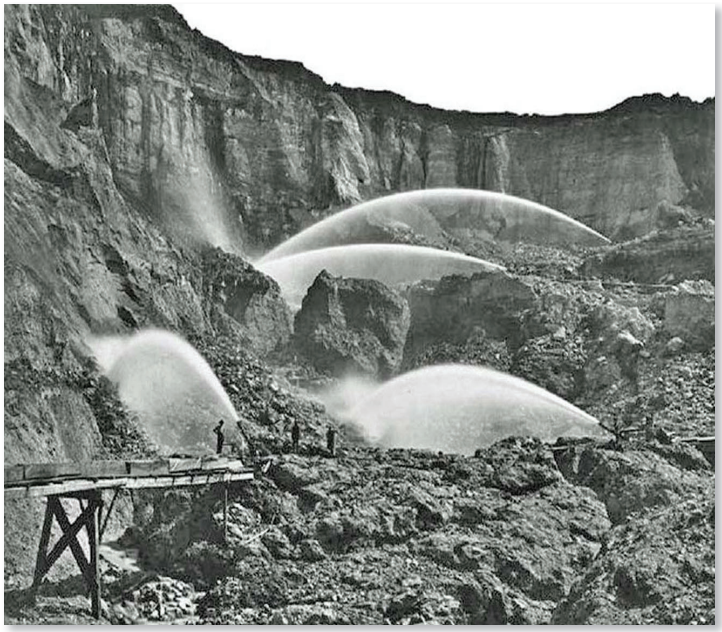
Claiming the right to use the water

The right to use water quickly became an issue as miners and mining companies vied for the same source, and as more miners needed to tap and divert water from natural waterways to work their claims. The water itself could not be owned, but an individual could declare the right to take and transport water simply by posting a notice at the diversion point in a waterway. This was known as "first in time, first in right," and granted permission to the initial person to claim the water source. This principal became an important feature of modern water rights law, establishing the rules by which it is determined who can tap the water, as well as how much is allocated for given uses.

In November 1850, two rival companies began to construct ditches to convey the water of Deer Creek to Nevada City. The Deer Creek Water Company began its ditch at the upper end of the creek, while the Coyote Water Company began at the other end of town. Unfortunately, after the completion of the ditches, the companies were involved in continual lawsuits as to the priority of rights. To avoid prolonged lawsuits, they consolidated in the fall of 1851.

The Deer Creek Water Company continued to be embroiled in controversy. Charles Marsh, owner of the Rock Creek Ditch Company, was furious over Folsom's new canal company bringing water to Coyote Diggings. Marsh felt that the mining law provided the greatest protection for his company serving the diggings, both the first to claim the water rights and for overall beneficial use. Marsh sued the Deer Creek Water Company, but the court battle lasted for only one year. As a result of negotiations, the two companies agreed to merge. The consolidated enterprise became prominent, using combined resources to provide more water to and further the mining interests in the region.

By 1853, primary water companies had emerged. Within a year, rivals Rock Creek and Deer Creek



Hydraulic mining used high pressure streams of water to blast away mountainsides at Malakoff Diggins in North Bloomfield.

companies consolidated to the South Yuba Canal Company, which became a primary supplier of water for hydraulic mining. The company built an 18-mile-long segment of the vital South Yuba Canal from 1853-1857. Even today, the canal is important infrastructure that carries water from the high mountain watershed into the Nevada City and Grass Valley area.

In addition, ditches, canals and wooden flumes snaked down from the higher elevations of the Sierra, conveying water by gravity to the mining sites. Flumes were built where no common ditch could be dug, such as alongside granite peaks or within steep ravines: "Among the wonders which strike a visitor on first seeing the mining regions of California, are the lofty aqueducts, constructed on trestle-work, for the purpose of carrying the water across deep ravines," noted Prof. B. Silliman and George Black in *Prospectus – Eureka and Yuba Canal Company.*

By 1867, the mining ditches, canals and flumes spread over 850 miles; the cost of construction was $4.5 million. In 1869 there were 120 canals in Nevada County, and by 1880 there were five large reservoirs and 1,000 miles of man-made waterways. The early basic ditches and flumes were augmented by a complex network of canals, pipelines and interconnections for hundreds upon hundreds of miles. Across deep canyons and hugging precipitous mountainsides, they brought billions of gallons of water to the mines. Reservoirs of all sizes that collected the snowmelt and conveyed it downstream provided the source water. Among these were the Bowman Dam; three dams owned by the Milton Mining and Water Company, forming the English Reservoir; the Fordyce of the South Yuba Canal Company; and the Eureka Lake Dam of the Eureka Lake and Yuba Canal Company.

Hydraulic mining is highly effective – and destructive

This water infrastructure provided billions of gallons of water integral to supply the eerily effective technique of hydraulic mining that depended on high-pressured jets to blast rock and dislodge gold deposits. The technique was first used in 1853, after placer miners realized the more gravel they could process, the more gold they were likely to find. Hydraulic mining became the largest-scale and most lucrative form of placer mining of the day. It also was the most devastating.

Here's how it worked: Snowmelt from the higher Sierra elevations was diverted from dammed reservoirs into wooden flumes and ditches, and gravity did the rest. Cascading down the conduits, the water would reach a mining site, where it was channeled through heavy iron pipes to explode from a nozzle, known as a monitor. Appropriately resembling a cannon, a monitor could blast a mountainside with such ferocity it left huge craters. The technique was very efficient at getting to the gold. Although the first monitors were small and used canvas hoses, at the height of hydraulic mining in the 1860s an iron monitor could be 16- to 18-feet long and capable of blasting a stream of water to wash away the mountainside target. Once the rock, dirt and debris fell to the ground, miners washed the gravel through sluices laden with mercury, and the heavy gold settled behind what was known as riffle boards. While the gold separated nicely, the amount of leftover dirt and debris was immense. That "waste" washed into rivers and streams, where it eventually ended up downstream with catastrophic results to the environment and farmers' fields.

The rise of hydraulic mining secured more than 1.5 billion cubic yards of gold-bearing gravels from the 1850s to 1880s in the northern Sierra

Nevada region, according to the U.S. Geological Survey, and estimates indicate 11 million ounces of gold were recovered.

The technique required an incredible amount of water. For example, the largest hydraulic mine was Malakoff Diggins on the San Juan Ridge, which used 100 million gallons of water per day during the height of its production in the mid-1870s. The system required to get the water to the site was impressive. Snowmelt collected in Bowman Dam in the higher Sierra was directed into the North Bloomfield main ditch. The water then flowed 55 miles down a steep grade to the mining site, where it was contained in a storage reservoir. When needed, the water was directed down a penstock into an ever-narrowing channel through a canvas hose and forced through an iron monitor. The resulting high-pressure water jets scoured dirt and gravel from the mountain face, and the water-sediment slurry would flow into a sluicing system, extracting the maximum amount of gold before releasing the remaining muddy material into a natural waterway. Regrettably, the sediment would wash downstream, choking the rivers and creating devastating damage to farmlands and riparian ecosystems.

Hydraulic mining came to an abrupt stop after one of the first environmental legal decisions in the United States in 1884. Two years prior, wheat farmer Edward Woodruff filed a suit against North Bloomfield Mining and Gravel Company on behalf of local farmers in the Central Valley. The lawsuit claimed the hydraulic mining operations resulted in the disposal of excess sediment and debris in local rivers and had destroyed a large portion of the valley's agriculture. Ninth Circuit Judge Lorenzo Sawyer ruled in favor of the farmers. The decision shut down the practice of dumping mining tailings into the Yuba River, which had destroyed farmland as far as 75 miles west to Sacramento. By 1900, the hydraulic mining operations had fallen silent.

Remaining was the vast infrastructure that had brought water to the mines. That infrastructure was the backbone of a water delivery system that would provide irrigation water to tens of thousands of acres of farmland and fields, as well as water for domestic use and drinking once the Nevada Irrigation District was formed. ■

"Fruit growing in Nevada County has proved successful in the past few years, and with irrigation will be one of the greatest resources of our county."

NEVADA COUNTY WATER CONSUMERS' ASSOCIATION, 1913

CHAPTER 2

The Birth of Local Agriculture

A Nevada County ranch in the late 1860s.

Agriculture in the Sierra foothills began during the Gold Rush and expanded afterward as the land was settled and communities were established. Initially, the influx of miners created a need for food. As an added benefit to farmers, the miners were willing to pay premium prices, making it enticing to raise crops, ranging from fruits and vegetables to wine grapes. During this time, ranches formed to raise sheep and cattle. In a short time, as agriculture developed, local farmers boasted of their quality crops and advertised their properties as the best grazing land in the state.

The most important horticulturist in Nevada County was Felix Gillet. Born in France, Gillet settled in Nevada City in 1859. By 1866 he had established the Barren Hill Nursery, one of the first fruit and nut nurseries on the West Coast of the United States. He began importing select fruit, nut and grape varieties from France and expanded to eventually include plants from more than 30 nations. Gillet has been referred to as the most important California nurseryman of his

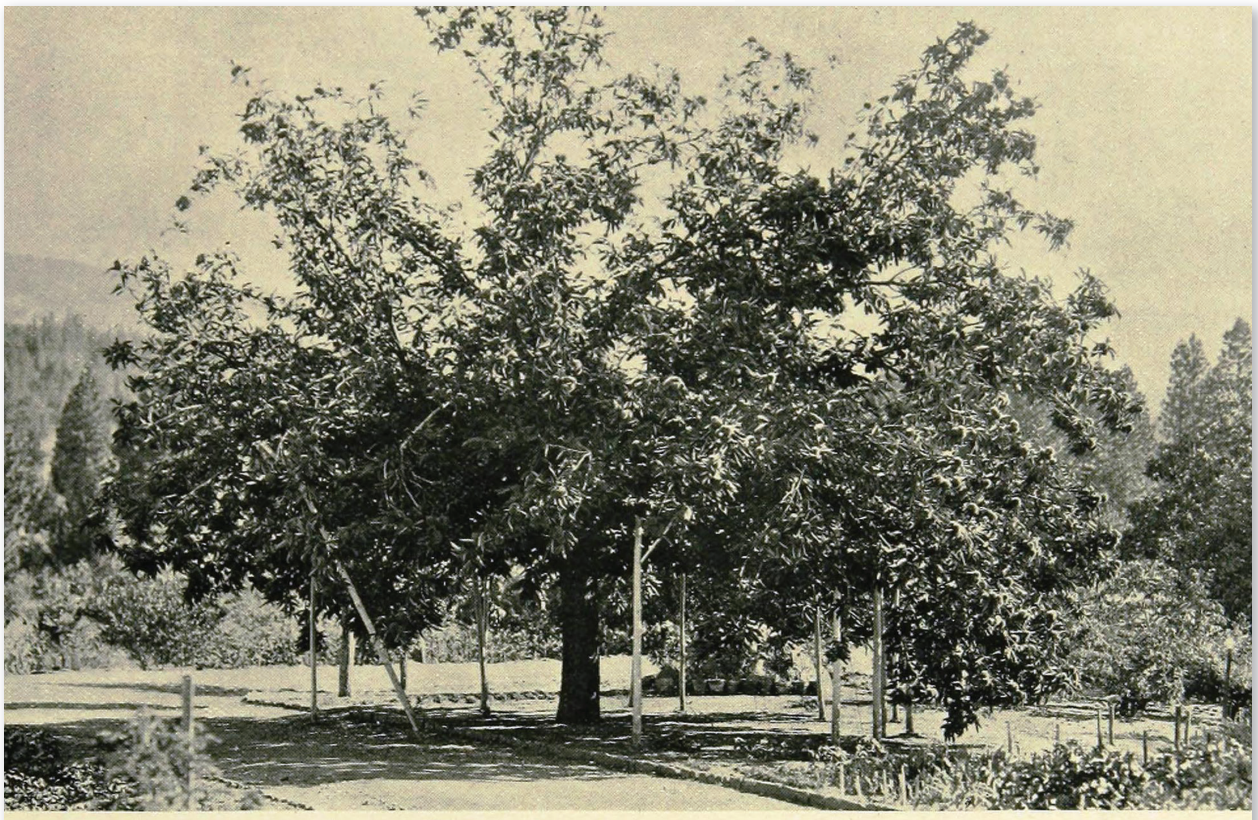
This 1884 photograph, below, shows one of Felix Gillet's chestnut trees in full bearing at Barren Hill Nursery in Nevada City.

generation, and his introductions provided primary varieties for Western agriculture, including almonds, walnuts, hazelnuts and chestnuts. He also introduced the primary varieties of prunes, cherries, pears, apricots, wine and table grapes, figs and strawberries.

Cattle, dairy cow and sheep ranches also thrived during this time. By 1880 Nevada County boasted of 206 registered ranches with 93,000 acres cultivated in western Nevada County. Besides their foothill properties, many ranchers leased land in the mountains. A common practice was to winter the livestock at the lower elevations, and then drive the herds up into the mountains for cooler summer grazing.

However, local agriculture took a hit with the rise of hydraulic mining, which saw the number of miners dwindle from several thousand to a few hundred. As a result many farms that supplied food to the miners were abandoned.

"The magical but feverish and short-lived prosperity of the passing period, the days of old,



MARRON COMBALE CHESTNUT.

A 32-year old tree, in full bearing, in Barren Hill Nursery, Nevada City, California.

the days of gold, the days of '49, had left its acutely depressing reaction," Lardner wrote in his 1924 history of the county. "Then, little by little, the initial stages of what is now California's giant industry, horticulture, began to influence agricultural expansion in this county, particularly in the development of the fruit-shipping industry opened the markets of the East and even of Europe to fresh fruits grown in the Sierra foothills. Truly speaking, they are 'fruithills.'"

Basically, local agriculture re-invented itself. Besides the quality crops and orchards being cultivated, a little public relations effort helped put Nevada County back on the map. The newly formed Nevada County Land and Improvement Association printed and distributed pamphlets throughout the United States, as well as Canada and Europe. For example, in 1888, a 96-page booklet promoted "The Famous Bartlett Pear Belt of California," claiming there was no superior place for growing conditions, and that every variety of fruit would grow and flourish in the county.

To the south, Placer County was also bustling with agricultural activity. The town of Lincoln was established in 1859 along the proposed line of the California Central Railroad. The new track reached Lincoln in early 1861, but further construction stalled due to lack of funds. However, the seed literally had been planted by those relocating in search of productive farmland. Agriculture thrived. Thomas S. Myrick wrote in February of 1881: "Thirty years ago the veteran pioneer in fruit culture in Placer County, Mr. James R. Nickerson, planted an orchard and vineyard on Doty's Ravine, three miles north of the thriving village of Lincoln. He sold his fruits at fabulous prices in the mining camps of Yuba, Nevada and Placer counties. In the process of time he extended his grounds until he had over one hundred acres in fruit and vineyard cultivation."

As the Gold Rush waned, agriculture quickly became the region's biggest consumer of water. Ranchers and farmers depended on groundwater wells, creeks and springs, as well as limited flows of water from the old privately owned ditch systems dominated by mining companies and companies that established themselves later to sell water. Still these sources could not provide adequate and dependable water supplies to meet the growing needs.

Johann Ludwig and Anna Elizabeth Bierwagen were advocates of forming an irrigation district. As an adult, Ernst Bierwagen (with his mother) went on to serve 25 years as a District director once NID was formed.

"The most limiting feature for agriculture in the county was the lack of irrigation water," noted the Nevada County General Plan 2012.

The California Legislature gave a nod to agriculture when it passed the Wright Act in 1887, allowing farming regions to form irrigation districts funded by bonds that were then payable from the proceeds of assessments levied upon the land. The Act permitted owners of small farms to band together and build water systems to store water for use during the irrigation season. It was a good idea, but new districts encountered problems in selling their bonds, filling their reservoirs and fairly allocating water. The state also realized there was insufficient state supervision to prevent the organization of wholly speculative districts and a failure to give the state any control of district finances. In 1897, the Legislature amended the Wright Act, which effectively stopped new irrigation districts from being formed. The Sierra foothill farmers and ranchers would have to wait for a solution to their irrigation needs.

Before organized irrigation, ranchers would take their livestock to higher elevations during the summer to graze and drink from the natural waterways.

As the new century dawned, farmers and ranchers were thriving in the foothills. However, they still had not secured a reliable long-term irrigation water source, even though there had been serious attempts.

To bolster Nevada County's name recognition, the Nevada County Board of Supervisors established the Nevada County Promotion Committee to disseminate information about the diversified resources of the entire county in 1902. Bayliss Rector was elected the first chairman to the committee (Rector and his brother, John, owned the National Exchange Hotel in Nevada City). Also elected to the commission was William Fellows Englebright, who acted as secretary. Englebright was a mining engineer who during the Gold Rush was the principal of the South Yuba Canal Company and owned two gold mines. In 1906, he was elected to fill an unexpired term in the U.S. Congress and was elected to the seat two more times to serve California's 1st District.

Nevada County farmers had grown restless and were more than ready for a permanent solution to their water needs. In May 1912, they gathered to protest high water rates charged by the privately held Excelsior Water and Power Company, which diverted water from the South Yuba River. According to The Sacramento Union newspaper, farmers were enraged when the company raised the price of water from $5 per acre to $7.50 per acre after the year's plantings had been completed.

Talks continued about a desire for a public water supplier. As the Nevada County Water Consumers' Association, formed in 1913, reported, "There is an abundance of water in the county for all purposes to which it may be applied, but it is held by large corporations which, for reasons of their own, are not developing it for irrigation. Fruit growing in Nevada County has proved successful in the past few years, and with irrigation will be one of the greatest resources of our county."

The association tried unsuccessfully to reach an agreement for the formation of an irrigation district and a partnership with Pacific, Gas & Electric Company (PG&E) to build new dams and canals. In February 1913, PG&E was also trying to secure water rights for the Yuba River and Bear River. PG&E Superintendent George Scarfe called it a scheme to secure funds through PG&E to build a new district's dam and canal systems. Later in the year, Scarfe met again with the water committee to give PG&E's side of the argument that the utility was in no position to enter negotiations for financing any large scheme to secure funds to build or form a new water district. He favored the farmers forming an irrigation district under the Wright Act. Such efforts were underway, and The Morning Union newspaper ran with the headline on November 1, 1914: "Eight local districts will organize to vote for an irrigation district formation." This new water district was to be formed under the California Irrigation District Laws of 1913, the revised Wright Act. The eight districts were Chicago Park, Forest Springs, Lime Kiln, Indian Springs, Cottage Hill, Pleasant Ridge, Clear Creek and Markwell. Despite prominent local farmers and ranchers supporting the effort, ultimately the proposal failed.

Meanwhile, local farmers became organized. The Bierwagen family, which in 1902 settled in Chicago Park, nine miles southeast of Grass Valley, became leaders in bringing together Nevada County farmers. Pioneers Johann Ludwig and Anna Elizabeth Bierwagen emigrated from Russia in 1881, farmed in South Dakota, then settled in Chicago Park. Their son, Christian, bought adjoining farmland next to the original homestead and worked alongside his father. In 1914, Christian invited landowners, their families and friends to a picnic, during which they formed a farm club to discuss issues and problems facing their community. A key focus was on the old ditches that conveyed water to pastures and farmland,

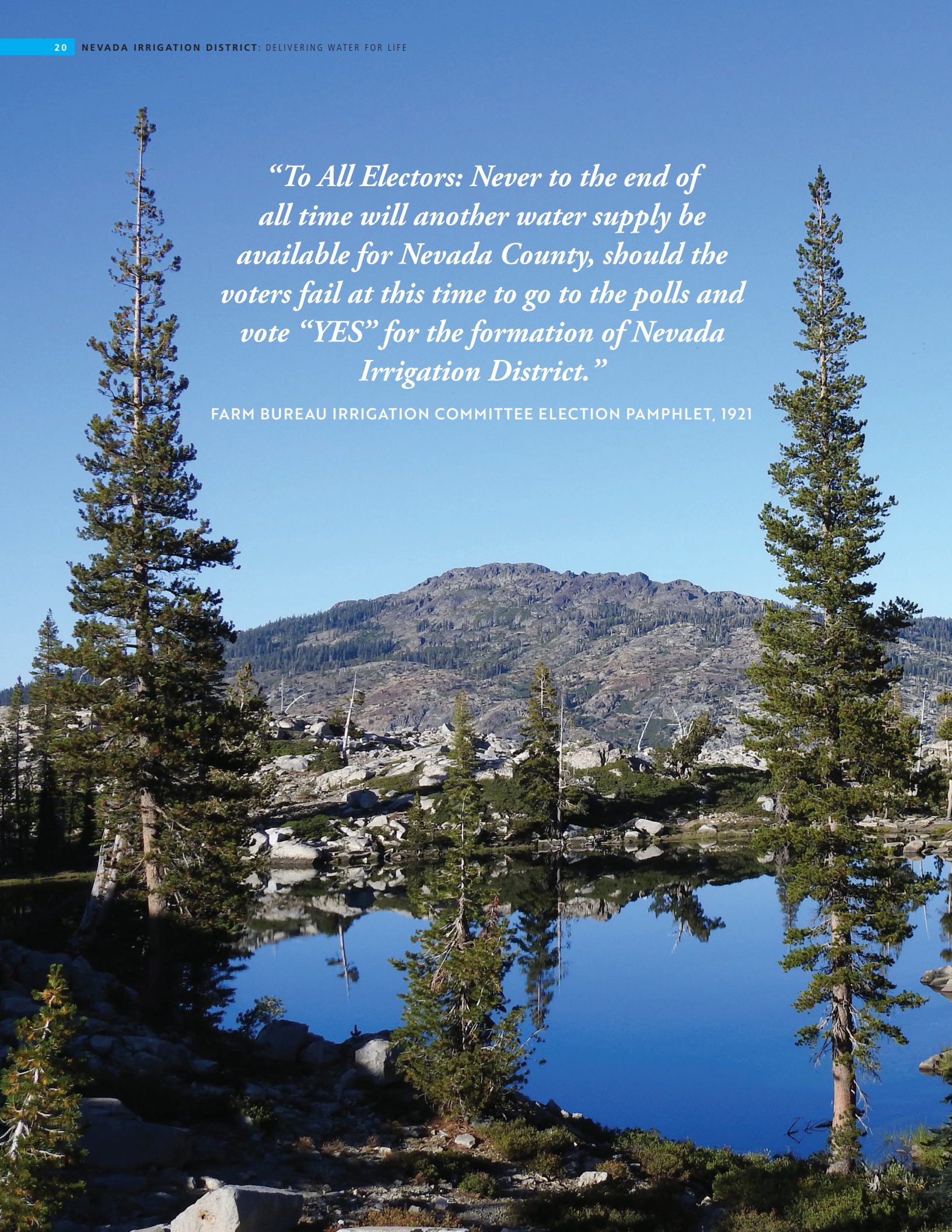
which were falling into disrepair at a time when agriculture was ramping up.

As the years progressed through World War I, Nevada County farmers toiled to meet demand for more food production needed during the war, and farming and ranching had become staples of the Nevada County economy.

On the governmental front, the Nevada County Promotion Committee was working to advance the recognition of agriculture. The group organized displays at state fairs and even at the Panama-Pacific International Exposition (the World's Fair) in San Francisco in 1915, when Nevada County won the Grand Prize for Bartlett pears, beating out fierce competition from many states and every pear-producing county in California.

"The publicity work of the Promotion Committee was far-reaching in its effect, and among the notable accomplishments of the publicity was the revival of the fruit industry. Many hundreds of acres of fruit were planted in the county as the direct result of the committee's activities," Lardner wrote in 1924.

Thirteen farm centers had organized in 1917, including Penn Valley, Chicago Park, Peardale, Gold Flat, Rough and Ready, Clear Creek, Forest Springs, Indian Flat, Lime Kiln, Grass Valley, Pleasant Valley, Birchville and North San Juan. Irrigation activists were motivated and were among the primary organizers in forming the Nevada County Farm Bureau. Community leaders had realized mining would no longer sustain the economy; private companies controlled water supplies – an increasingly expensive situation – and they feared that if they did not ensure a long-term water supply for their community, valuable water resources would be claimed by downstream interests. They became committed to finding a local solution that could sustain their agricultural industry, give them a voice in the operations and, above all, secure a reliable water source for the region under an organization that could maintain and manage a quality supply of water for many generations. The next few years of hard work helped realize the dream. ■



"To All Electors: Never to the end of all time will another water supply be available for Nevada County, should the voters fail at this time to go to the polls and vote "YES" for the formation of Nevada Irrigation District."

FARM BUREAU IRRIGATION COMMITTEE ELECTION PAMPHLET, 1921

CHAPTER 3

Dreams of Water Lead to the Formation of Nevada Irrigation District

KATE AND BERT CHURCH, two of the dedicated promoters of Nevada Irrigation District in the late twenties. "Ma Church" was given the honor of dedicating the rebuilt and enlarged Bowman dam 29 years ago. This picture was taken on their 50th wedding anniversary in 1940.

Bert and Kate Church

Western Nevada County cattle ranchers Munson Bernard "Bert" Church and his wife, Kate, were among Nevada County's strongest irrigation advocates. Like many ranching families, they had access to grazing land in the mountains, near the present site of Jackson Meadows Reservoir. During those early summers when foothill pastures would turn brown, the couple would drive their cattle to the green pastures of the Sierra. There, they crystallized dreams of a water system where the tumbling and abundant clear waters of the high mountains could be carried to the fertile but dry farms and ranches of the foothills.

Doyle Thomas, who headed the District's public relations outreach, wrote the following account in 1956 as part of Nevada Irrigation District's Founders Day Picnic and 35th Anniversary: "Nearly 49 years ago, Kate Church, astride her horse high on a mountain top, looked upon rushing, tumbling Sierran streams far below. It was not a new sight. For many years she and Bert Church, her husband, had driven their cattle to lush mountain meadows from parched unwatered

Alfonso A. Tregidgo, mining expert (left), and Eugene J. de Sabla, Jr., in 1895, while constructing a flume for the Nevada plant of the Nevada County Power Company.

Alfonso Tregidgo (left) and Eugene de Sabla in 1895, while constructing a flume for the Nevada County Power Company.

pastures miles away. This day, she saw the wasted waters as if for the first time. Her mind envisioned a great irrigation system transporting life-giving water to dry, but fertile acres, bringing growth and prosperity. A dream was born. Far into the early summer night this pioneer woman and her husband made plans. As the last red embers of the campfire died away, Kate Church knew of a certainty that she must do and more important, how she could accomplish her purpose."

The Churches worked with Nevada County Farm Adviser Herman Graser, who spent several days in 1919 with Bert Church surveying the high mountain watersheds, including around Jackson Meadows, English Meadows and Bowman Reservoir: "He was greatly impressed with the potentialities of these great sheds, lying unused, as a future source of irrigation waters," Lardner wrote.

Other important figures soon joined Graser in exploring a viable irrigation alternative. J.E. Taylor, president of the Grass Valley Chamber of Commerce; A.L Mooser of the Nevada County Bank; and Joseph O'Connor, a Nevada County engineer, accompanied Graser on a trip to Canyon Creek and the South Yuba River on May 4, 1919. The prospect was so enticing that afterward several applications were filed with the State Division of Water Rights in the name of J.F. O'Connor. These filings were later turned over when the Nevada Irrigation District formed, and they became the District's first and basic applications.

As an organized movement mounted to secure reliable irrigation, the local chambers of commerce called a year-end meeting among representatives of neighboring Yuba and Sutter counties, as well as state officials, including from the State Board of Control and the State Water Commission. The idea of a tri-county association was established. The efforts went so far as circulating petitions for the organization of an irrigation district. "Then came a period of reverses. It became evident that farmers in the neighboring counties had lost interest. Coupled with this fact, it was discovered that the petitions which had been widely circulated and signed were not legally drawn," Lardner wrote.

The Nevada County contingent was undaunted, however. E.O. Gassaway, president of the Nevada County Farm Bureau, formed a committee to organize a district under the California Irrigation Act of 1897. The Act, an amendment to the state's original 1887 Wright Act, allowed farming regions to form and bond irrigation districts. By late 1920, the campaign was in full swing. On December 30, The Sacramento Union, in an article datelined from Nevada City, reported, "The petition to the supervisors asking for permission to form an irrigation district is being liberally signed in this city and Grass Valley."

The irrigation movement was centered mainly in the farming and ranching areas of Nevada County as the cities of Grass Valley and Nevada City had their own small water systems. Even so, residents and business leaders of the cities were quick to recognize the value of a better community water supply. Water rights for the proposed irrigation district drew formal protests in quarters where there were competing interests, including from the city of San Francisco.

The local campaign continued, however, and on March 15, 1921, the committee presented petitions carrying 797 signatures of residents in favor of forming an irrigation district to the Nevada County Board of Supervisors. The documents were declared good and sufficient, and a copy was filed in the State Engineer's office.

Leading up to the public vote, much work needed to be done. The State Engineer required all lands to be included in the District to be surveyed, mapped and defined. The San Francisco firm of Fred H. Tibbetts was hired to make the survey, estimated to cost $17,500 with the total expenses up to $22,500. To cover organizational costs,

the committee turned to the community, asking for pledges from landowners, with the caveat that if the District's formation was successful at the polls they would be repaid, but if the District failed their pledges would be lost.

Landowners with 100 acres or fewer were asked for loans of $10; those who owned 100 to 500 acres would loan 10 cents per acre; and those with more than 500 acres would loan an additional 5 cents per acre. Other citizens were invited to participate to a maximum contribution of $100.

The plan called for a Board of Directors to be seated as part of the District's formation. Among the board's first actions would be to impose a land tax that would repay the landowners who had put up money to back the new District.

The survey results soon reported that the total acreage of the proposed district was 208,360, all in Nevada County. Of this area, 125,307 acres were reported as tillable and irrigable by gravity; 29,624 acres as arable but irrigable only by pumping; and the balance was classified as grazing and timberland.

Upon receiving the survey, the State Engineer made a favorable report, and the Nevada County Board of Supervisors called an election on August 4, 1921, to put the proposition of a locally controlled irrigation district before voters.

The timing was right, especially as families were continually losing their farms and ranches due to a failing water source. Still, an aggressive campaign in favor of a new district ensued.

A 1921 election pamphlet, produced by the Farm Bureau Irrigation Committee, declared: "To All Electors: Never to the end of all time, will another water supply be available for Nevada County, should the voters fail at this time to go to the polls and vote "YES" for the formation of Nevada Irrigation District. You know how inadequate has been the water supply afforded us for years past, and the reasons why hardly a season passes without a water shortage. If you permit private corporations to seize the only remaining water sources in this county, YOUR LAST OPPORTUNITY for cheap and abundant water WILL BE GONE FOREVER!"

Rome Powerhouse on the South Yuba River was the first hydroelectric plant in Nevada County.

Leading up to the election, regional water was in the hands of nine main companies, which had secured the rights to use most of the water. These were the North Bloomfield Mining and Gravel Company; Eureka Lake; Yuba Canal Company; Excelsior Water and Power Company; the South Yuba Canal Company; the Omega Ditch Company; Blue Tent Mining and Water Company; Liberty Hill; and Consolidated Mining. These companies, finding it difficult to operate and manage the ditches and canals alone, had begun to incorporate.

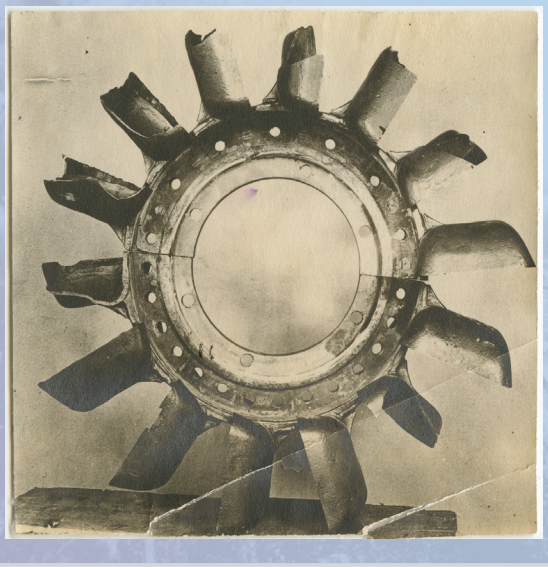
Many landowners feared the loss of the ditches to private water companies would lead to the loss of the historic water rights that went with them, putting them completely at the mercy of the private companies. Some even warned that local communities would become ghost towns as a result. An election pamphlet noted: "If these (rights to use water) should lapse NEVADA COUNTY WOULD BE DOOMED to eternal water shortage, because private corporations, hostile to the interests of the people, are watching our sources of water supply with greedy eyes, ready to initiate adverse rights if our rights should lapse for ONE INSTANT."

Hydroelectric energy is necessary to afford a water district

Campaign leaders agreed that a future Nevada Irrigation District could not succeed if funded solely through water sales. The key to formation, committee members said, was a contract with the Pacific Gas & Electric Company (PG&E) that would ensure the district revenue through hydroelectric power earnings.

What is a Pelton Wheel?

The Pelton Wheel is a local innovation. The wheel is an impulse type water turbine that extracts energy from moving water. Invented by Lester Allan Pelton in the 1870s and manufactured at the Miners Foundry in Nevada City, the wheel featured split buckets side by side that would harness the kinetic energy of flowing water. The invention revolutionized the generation of hydroelectricity. By directing water into dual buckets, the efficiency doubled over a standard water wheel, ranging from around 30 to 90 percent increase in efficiency.



Hydroelectric power is generated by transforming the energy created by flowing water into electricity. The Greeks were first to use water wheels for grinding wheat into flour more than 2,000 years ago. In Nevada County, water diversions central to early mining endeavors expanded for hydroelectric power use. The technology had advanced since the time of the Greeks, of course, but the concept remained the same: Energy from moving water turned a turbine connected to a generator to produce electricity.

An NID election pamphlet from 1921 stressed the importance of hydroelectric generation: "No person in Nevada County or elsewhere considers it either possible or safe to finance Nevada Irrigation District except by aid of power earnings, and a contract which assures an absolutely safe income from power earnings must be entered into before the people would be safe in approving a bond issue. Furthermore, such a contract should run at least as long as the bonds."

The legacy of regional hydroelectricity and actually the formation of PG&E can be traced to Nevada County. The first electric power in Nevada County was generated at a small water-driven plant installed at the Charomat Mine, near Nevada City, in 1887. "In the evening of the 5th of August of that year arc lights were seen for the first time in Nevada City. Fire bells rang, and the population of the mining town assembled. Everybody wanted to see the wonderful new illumination. … The system was soon extended to Grass Valley, three miles over the ridge, and on Saturday night, August 22, Grass Valley had its first electric lights. Again, curious crowds thronged the streets and proudly eyed the dazzling arcs, as the people of Nevada City had done three weeks earlier," Lardner wrote.

Hydroelectric generation ramped up in 1892, when Alfonso Tregidgo acquired water rights on the South Yuba River for the development of hydroelectric power that would be transmitted to area mines. That year, Tregidgo and Eugene J. de Sabla formed the Nevada County Electric Power Company to construct an electric powerhouse to provide inexpensive power to the more than 60 mines clustered in the area, including their own Peabody Mine in Grass Valley. In late 1894 de Sabla was introduced to John Martin, who would provide and install the electrical equipment in the new plant and also build and equip the transmission line from the plant to Nevada City and Grass Valley.

As the story goes, the men forged the agreement for the powerhouse project at the National Exchange Hotel in Nevada City in the hotel bar and later in de Sabla's office in the hotel's Suite 74. The three men were joined by investor Romulus Riggs Colgate (the grandson of the founder of the soap and perfume manufacturer Colgate and Company), who had ventured west to acquire gold-mining properties in Grass Valley and Nevada City. Colgate became a $40,000 investor for one-fifth interest in the Nevada County Electric Power Company.

The first powerhouse was the Rome Powerhouse, located in a steep river canyon, downstream

from today's Purdon Crossing on the South Yuba River near the confluence of Rock Creek. Rushing water directed through a penstock powered two large Pelton wheels connected to two Stanley Electrical generators that Martin provided.

The challenging engineering feat was a success; hydro-generation began, and the power was first turned on February 5, 1896. The Daily Transcript reported: "The electric lights of the Nevada County Electric Power Company were turned on at 6 o'clock last evening for the first time and attracted considerable attention. The lights were quite brilliant and the office of the company on Pine St. received many visitors. The lights were burned in Lane's livery stable, the Morgan House at Grass Valley and the company's office, these being the only places wired and connected thus far, but in a few days many other business places and residences will be connected and lights furnished them. The officials of the company felt very much pleased over the excellent beginning made and promise that it will not be long that power, as well as lights can be furnished to all who desire it."

The plant proved so successful Martin and de Sabla decided to expand to the market for electrical power in Sacramento and San Francisco. In a short time, they created the largest network of electric power lines in the world. The local Nevada County Electric Power Company evolved into Bay Counties Power Company, which became the California Electric Company, then California Gas & Electric Company and finally PG&E, incorporated on October 10, 1905. Martin and de Sabla are known to this day as the "fathers of PG&E."

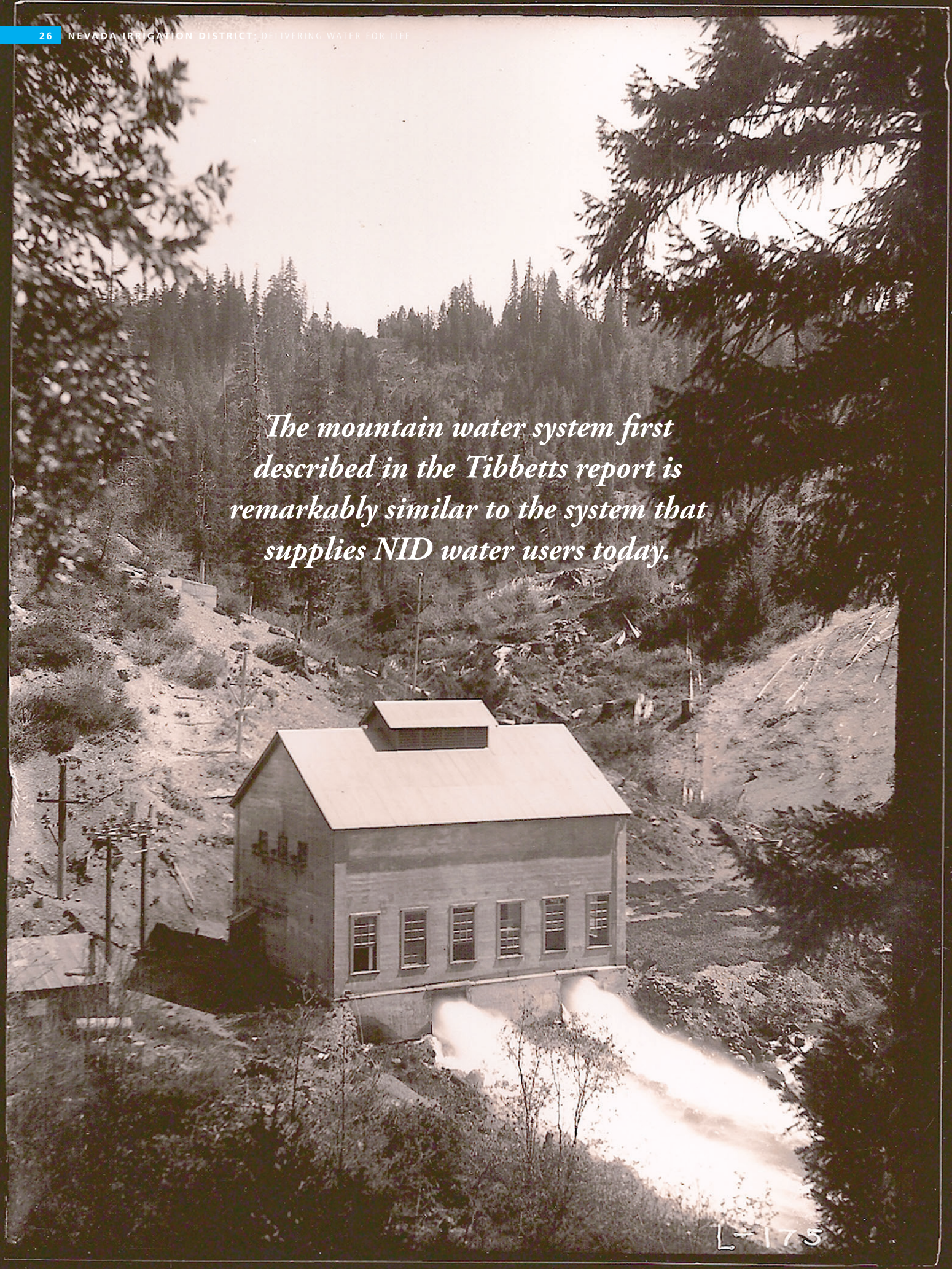
With PG&E's initial support and agreement to negotiate a water and power contract – and a needed bond issue still a few years down the road – the committee felt comfortable in estimating future costs to ratepayers. Irrigation water would cost 10 cents per miner's inch (11.22 gallons per minute) for a 24-hour flow, or $2 per acre-foot, for an average cost of $6 per acre irrigated. "In time this rate could be reduced," noted a pamphlet sent to voters. "Finally, when all the bonds are paid off, the power income would more than pay all district expenses and the land would have free water forever."

The first NID Board of Directors

Election Day – an overwhelming affirmation

During a public election on August 5, 1921, voters recommended formation of the District by a margin of 636-163. Nevada County Supervisors authorized the new District, and 10 days following the election, on August 15, 1921, the NID officially formed. The District's first board meeting occurred that day in Grass Valley's Bret Harte Hotel. The newly elected directors included Willis Green, First Division; William B. Ullrich, Second Division; M.B. Church, Third Division; Guy Robinson, Fourth Division; and Theodore Schwartz, Fifth Division. E.C. Morgan was named Assessor; W.G. Robinson became Tax Collector, and Herbert J. Nile was Treasurer.

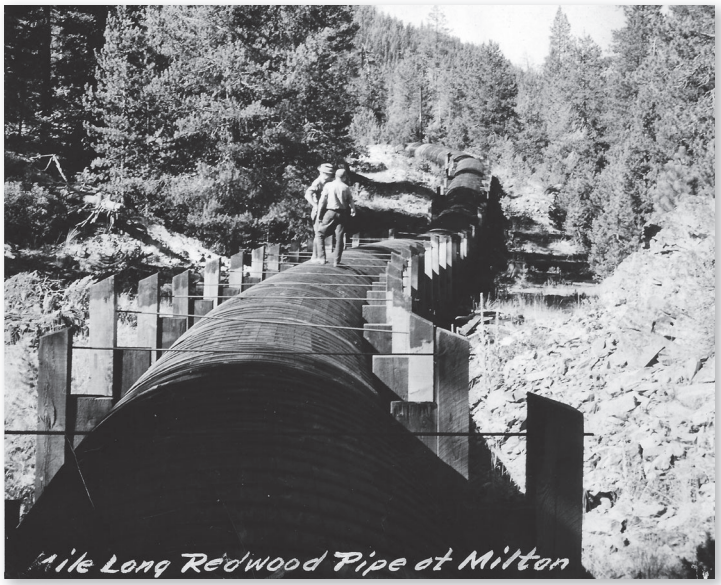
It would take six years before water would flow to farms and fields as the new District found its footing. The focus during the first several years was on acquiring water rights and the infrastructure built during the Gold Rush to deliver water supplies to the foothills. ■



The mountain water system first described in the Tibbetts report is remarkably similar to the system that supplies NID water users today.

CHAPTER 4

The New District Takes Shape



NID workers inspect the wooden pipe at Milton Reservoir.

Facing a Herculean task, NID's founding Board of Directors hit the ground running to launch the new District and get irrigation water flowing to ranches and farms. The Board set out to develop a water supply and secure water rights, as well as to establish a long-term contract for the sale of water that could pay for the full cost of tapping high-country mountain works. On the agenda was to establish an organizational structure, commission engineering studies, prepare for a bond election and begin negotiations for the purchases of property and water systems.

One of the Board's first actions was the hiring of a District Manager, a move complicated by a lack of funding. The fledgling District had no budget; its only money in the bank was that pledged by local landowners. The Board found their man in Aubrey L. Wisker, a local irrigation advocate and promoter who accepted the Manager position for a starting salary of $1 per month. From 1921 to 1928, Wisker guided the District through key water right acquisitions, land acquisitions and policy decisions. A visionary who was early

Aubrey Wisker, NID's first manager

in recognizing NID's potential for developing hydroelectric energy, he led the new District with wisdom and leadership that earned him respect as the "Father of NID."

Educated in San Francisco, Wisker was a mining engineer and had many wealthy friends and acquaintances in New York and Boston. After moving west he bought what is now known as the Loma Rica Horse Ranch. In addition to his mining skills, he was a land developer and had worked for the Empire, New Brunswick and North Star mines. Leading up to NID formation, he had been growing pears near the Bear River in an area known as the Chicago Park Colony. The colony, established by people of German heritage who had moved from Chicago, featured growers who pursued dry land farming because they had no irrigation system in place.

Since 1915, Wisker had been a vocal supporter of a Nevada County irrigation district. He formed a group of 68 supporters, worked with Kate and Bert Church, Nevada County Farm Adviser Herman Graser and others in forming the Nevada County Farm Bureau in 1917, and later served as secretary of the short-lived Yuba-Nevada-Sutter Water & Power Association.

As NID's founding manager, Wisker worked quickly to acquire water rights and water systems, the key to being able to access and divert the water needed to supply the District's irrigation customers. Beginning with its first water rights application and through its formative years, NID aggressively worked to acquire necessary water rights, though many of the applications remained under state review for months and years as the District moved forward.

Among his duties were monumental start-up actions, including District organization, engineering studies, a bond election, property negotiations, as well as the purchase of water systems from the private companies. He also negotiated important acquisitions, including portions of the historic South Yuba Canal from PG&E, allowing NID to supply water through the Cascade and Snow Mountain water systems. In addition, the District was able to acquire assets of the Excelsior Water and Power Company and the New Blue Point Mine's Tarr Ditch.

Wisker also was instrumental in the acquisition of Bowman Reservoir and in securing the North Bloomfield Water and Power Co. from the William Bourn interests in San Francisco, which had interest in Malakoff Diggins, the enormous placer mine on the San Juan Ridge. In a savvy business move, Wisker allowed Bourn to retain the rights to the Bloomfield Canal, which the magnate wanted to preserve future supplies for his enormous hydraulic placer mining deposits on the San Juan Ridge. In return for deeding the Bloomfield Canal back to Bourn, Wisker was able to acquire properties near Bowman, including French, Faucherie and smaller reservoirs that stand near the headwaters of the modern NID water supply. Property at English Mountain was included.

Fred H. Tibbetts – a visionary guide in a new frontier

Fred H. Tibbetts

San Francisco-based civil engineer Fred H. Tibbetts was named NID's first District Engineer after conducting engineering studies of its boundaries in April 1921. Few engineers in the history of California have contributed so extensively to the development of its agricultural lands and the control and conservation of its waters. His resumé was sterling. In addition to being a principal in a San Francisco engineering firm,

Bowman Lake

Tibbetts served as chief engineer of four large reclamation districts, two water conservation districts, seven irrigation districts, two land development companies and a hydroelectric power company in Anchorage.

Within a year of NID's formation, on February 10, 1922, he submitted his final engineering report, which identified mountain water sources and the infrastructure needed to carry the water to the farms and ranches of Nevada County.

"If satisfactory arrangements can be made to sell the power (this would be accomplished in a 1924 agreement with PG&E), the district should immediately bond itself to pay for capital changes and secure every possible water right," Tibbetts wrote in the introduction to his 97-page report.

The report also described the elevations, topography, geography, and irrigable and non-irrigable lands of the District. "Because of the favorable climate conditions this district should ultimately develop into one of the best fruit districts in the state," he predicted.

Tibbetts outlined the framework of an irrigation district that would collect water from two primary mountain watersheds and include sources for Bowman Reservoir, Jackson Meadows, the Bear River, Deer Creek and South Wolf Creek. He envisioned the District would collect most of its water from a 71-square-mile watershed, ranging in elevation from 5,400 feet to 8,500 feet. Central to the system would be the existing Bowman Reservoir, which had been built on Canyon Creek in 1872-1876 to supply hydraulic gold mines on the San Juan Ridge. Tibbetts described the original builder of Bowman Reservoir, Hamilton Smith Jr., as "one of the best-known hydraulic engineers of the last generation."

The mountain water system first described in the Tibbetts report is remarkably similar to the system that supplies NID water users today. Near the top of the system, northwest of Truckee, Jackson Meadows Reservoir was plotted, but would not be built until the 1960s.

Water from Jackson Meadows flows through Milton Diversion Dam, and then to Bowman through the Milton-Bowman Tunnel. Additional supply flows to Bowman from French, Faucherie and Sawmill upstream of Bowman on Canyon Creek. Below Bowman, the Bowman-Spaulding Canal carries water to PG&E's Spaulding Reservoir on the South Yuba River watershed.

This critical link would be 11 miles long, with 9.7 miles of open canal and 6,970 feet of conduit encased in three tunnels.

At Lake Spaulding, it would mix with PG&E water and pass through turbines on its way to either the PG&E Drum System (which parallels today's Interstate 80 along the Bear River) or down the north side of Bear Valley into the PG&E South Yuba Canal, which supplies Deer Creek, NID's Cascade system and the greater Grass Valley-Nevada City area.

The NID Board of Directors approved Tibbett's report and set out to acquire water rights, secure properties, negotiate a contract with PG&E and issue a bond to generate revenue.

PG&E water contract – "A new day is dawning. ... At long last the District is launched"

At the onset of District formation, Directors and the General Manager opened negotiations with PG&E to seek a contract regarding use of District water for PG&E power purposes. PG&E had not been viewed as cooperative during the formation process, but now the relationship of the two organizations would take on a much friendlier flavor. The fruition of this was a lucrative contract in 1924 that would permit NID to progress.

During its then-brief history, PG&E had amassed reservoirs and infrastructure, as well as water rights, to ensure hydroelectric power for its growing electric service in Northern California. Tapping water from the South Yuba and Bear rivers, the utility in 1912 began to construct six power plants with a capacity of 190,750 horsepower, and strung a 110-mile transmission line to carry 100,000 volts to PG&E's switching station at Cordelia, California. Starting in the Bowman Lake corridor, PG&E began to build its empire by impounding water in Fordyce, Meadow and Sterling reservoirs for hydroelectric operations via a complex network of canals and creeks downstream at Lake Spaulding. Notably, the utility company owned and operated Lake Spaulding Dam, completed in 1913, using the water of the south fork of the Yuba River, which originates near Donner Pass. At the time of construction, it was the highest dam in California.

On March 5, 1924, after three years of negotiations, a telegram announced: "Mutual concessions proposed by (NID) District and (Pacific Gas & Electric) Company in conference before Railroad Commission this afternoon provide basis which Commission approves for contract with Company that will safely finance District," as reported in The Morning Union in Grass Valley.

NID Engineer Fred Tibbets at Faucherie Lake in the 1920s.

The terms of the contract spelled out the details, which included how to route NID water through the PG&E powerhouses. PG&E agreed to use the water developed by NID for the development of power in a portion of the Drum-Spaulding system, a complex array of mining canals, reservoirs and hydroelectric facilities that had been in operation since the late 1800s. A new powerhouse would be built on the rim of Lake Spaulding; those waters would be later released through the Deer Creek powerhouse and an outlet leading into Bear River near the Narrow Gauge railroad bridge. After PG&E used the water, it would be returned to NID. PG&E agreed to pay between $375,000 and $400,000 per year, assuring the District a solid income to develop its operations.

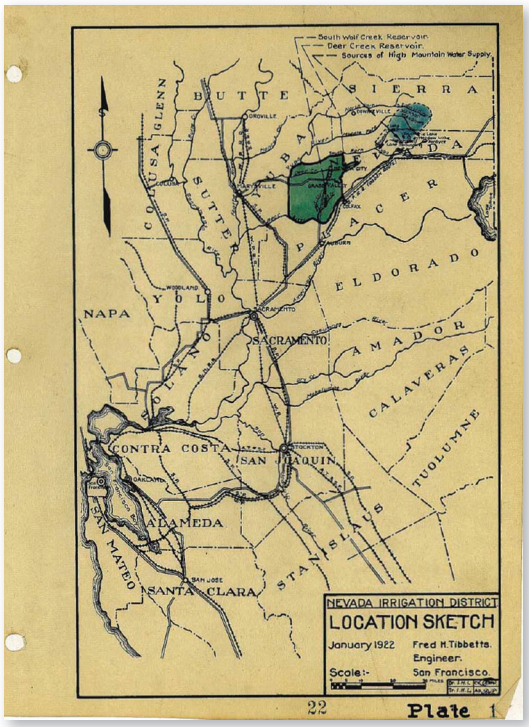
This contract was important: With the backing of PG&E, NID turned to efforts to issue a bond. The money would be used to raise Bowman Dam, construct the Bowman-Spaulding Canal and construct the Milton-Bowman Tunnel.

Bond issue supplies money to get the water flowing

In 1922, NID applied to the State Bond Commission for the authority to conduct a bond issue, as leaders desired financing to acquire water rights, as well as purchase and construct the basic facilities that would become the District's water storage and delivery system. Established with a little more than $2,500 in pledges from local farming and business communities, the District got a boost by its landmark 1924 agreement to supply water to PG&E power plants. The wait was over in 1925 when the State Commission authorized an election for a $7.25 million bond issue.

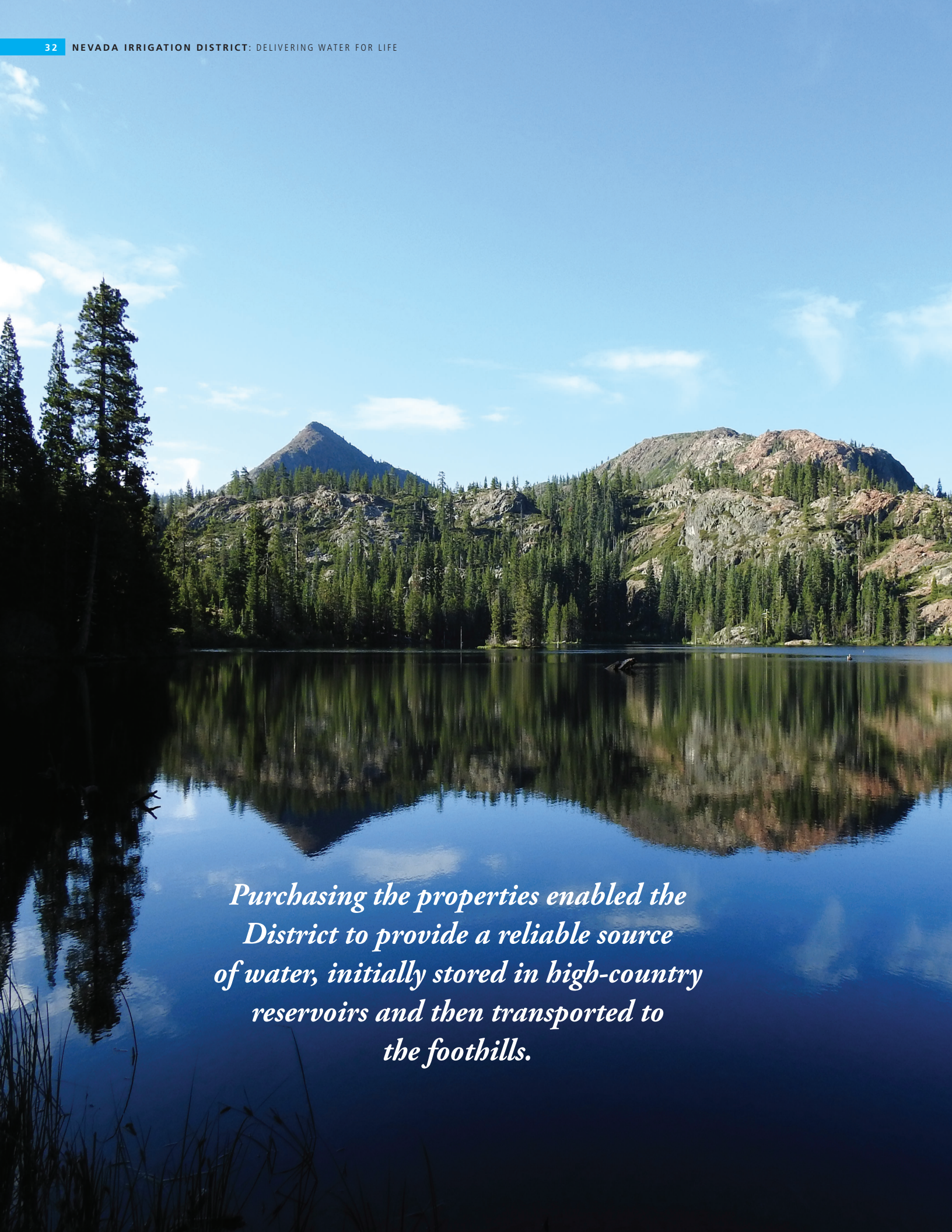
A campaign commenced with farming and business interests lining up on the pro side and landowner groups concerned about debt and taxes coming out in opposition. Local business leaders saw the value of a stable and reliable water supply for their communities. A major opponent of the bond issue was the Interstate Land Holding Co. of Smartsville, backed by Excelsior Water and Power Company, which had been selling water on a private basis. Other opponents listed in campaign materials of the time were the Nevada County Tax Payers League and the Landowners Protective Association. Before the election, on February 28, 1925, The Sacramento Bee reported it to be "an exciting campaign in progress for several months and increasing in intensity in the past few weeks."

When the ballots were counted, NID had achieved its second victory at the ballot box. Now it had $7.25 million in the bank to build a water system. And it was time for Wisker, "the father of NID," to work his magic. Over the next three years, he negotiated the acquisition of several properties that remain today as the backbone of the NID water collection and distribution system. ■



Tibbetts' map of the District – 1922

NID's first Board of Directors met at the Holbrooke Hotel in 1921.



Purchasing the properties enabled the District to provide a reliable source of water, initially stored in high-country reservoirs and then transported to the foothills.

CHAPTER 5

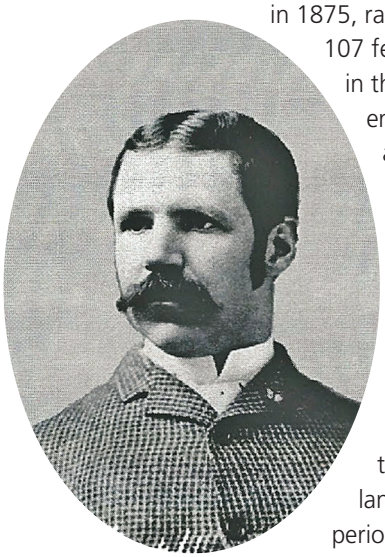
Securing a Water Supply from the High Sierra

Local families enjoy the natural surroundings at Bowman in 1897.

It didn't take long to put the financing to good use. The central focus was on securing a water supply in the high Sierra Nevada. But the new District had competition for the vital source of mountain snowmelt and the infrastructure needed to transport the water to the lower elevations. For example, Wisker and the NID Board were well aware that PG&E was making offers to buy Sierra holdings. The utility had hoped to control the market on hydroelectricity, and then sell the water to the San Francisco Spring Valley Water Company, a private company that held a monopoly on water rights in San Francisco from 1860 to 1930.

The series of many lakes in what's known as the Bowman corridor today was especially enticing to NID. French Lake, at an elevation of 6,835 feet, is part of that series of lakes, including Bowman Lake, Sawmill Lake, and Faucherie Lake to the northwest. French Lake was a natural montane lake of great depth that was harnessed by a rock-filled dam first constructed in 1859 at the headwaters of Canyon Creek. Not far away, as the crow flies, the Faucherie Reservoir, also originally a natural lake, was raised by a dam to an area of 90 acres and of 8.8 million cubic feet (202 acre-feet) by the Eureka Lake Company.

Bowman Reservoir, at an elevation of 5,500 feet, is located about 23 miles northeast of Nevada City. The reservoir was named for James. F. Bowman, a native of Scotland. The dam was 65 feet high in 1875, raised to 85 feet in 1876 and then 107 feet, making it the highest dam in the world until 1888. In 1880, an engineering camp was established at Bowman Lake "with a large crew engaged in surveying the big water and power project it has undertaken. The company, a subsidiary of the Ayer interests, plans an immense hydroelectric development in this region and also the distribution of water to a large area of agricultural land," noted the Electrical West periodical, Volume 47, published in July 1921.



William Bourn II owned the Empire Mine in Grass Valley.

Spaulding Dam, owned and operated by PG&E, featured a 275-foot-high dam, which was designed by John Ripley Freeman and completed in 1913 to impound the South Fork of the Yuba River, which originates near Donner Pass. At the time of construction, it was the highest dam in California, and one of 10 PG&E hydroelectric facilities.

In 1924, Lardner noted: "Nevada County in pioneer days boasted the largest and most expensive ditch system in California; today, with the Excelsior Water and Power Company, the Pacific Gas & Electric Company and the Nevada Irrigation District in the field for control of all the unharnessed water for power and irrigation, it looks as if Nevada County is coming back to its own and may claim to be the greatest county for power and water in the State."

The early English Reservoir featured a wooden dam face.

With a bright future, the District was about to make some bold moves. At the time, the private mining companies' activities were dwindling, and many were going bankrupt. Yet PG&E and NID understood the new "gold" in the Sierra was water supply. PG&E's intention was to bring water from the Middle Yuba River to the South Yuba River through Spaulding Reservoir and then down the Bear River to the massive powerhouses the utility had planned. PG&E wanted control of most, if not all, water going to Nevada and Placer counties, according to Les Nicholson, former NID Hydroelectric Manager: "Some of the arguments between NID and PG&E were pretty ruthless, because both were seeking equal footing."

For years Bowman Reservoir was valued as a prominent site for a substantial storage reservoir. At one time it had been the property of W.B. Bourn interests of San Francisco. William Bowers Bourn II was one of the San Francisco elite, who had inherited and operated the Empire Mine in Grass Valley, one of the oldest, deepest, and richest gold mines in California. The mine extracted 5.8 million ounces of gold before it closed in 1956. Bourn also controlled the San Francisco Gas Company, and was an investor in Spring Valley Water Company, which later merged into PG&E.

Importantly to NID, Bourn owned the water rights to reservoirs and ditches that were part of the Northern Water and Power Company. This included the Bowman Reservoir built in 1876, at less than one-third the size it is today, and the North Bloomfield Canal, the artery that conveyed water to Malakoff Diggins.

In the early 1920s, PG&E offered $1 million in stocks and bonds to purchase these high Sierra water properties, infrastructure and water rights from Bourn. However, the magnate felt that someday hydraulic mining would come back, and he would need the canal to supply water to his mining operations. As a result, he declined the $1 million offer from PG&E.

When Wisker, who knew and had worked for the Bourn empire, learned that PG&E had made an offer, he sensed an opportunity. The NID manager traveled to San Francisco to meet personally with Bourn to discuss the properties and infrastructure that were key to securing a water supply for the foothill farmers and ranchers, the new NID customers.

In a 1956 interview, Wisker recalled the conversation with Bourn. Wisker said, "I understand you may want to rid yourself of the upper properties." Bourn replied, "I've been made a very lucrative offer, but the North Bloomfield Canal … what would you do with the North Bloomfield ditch?"

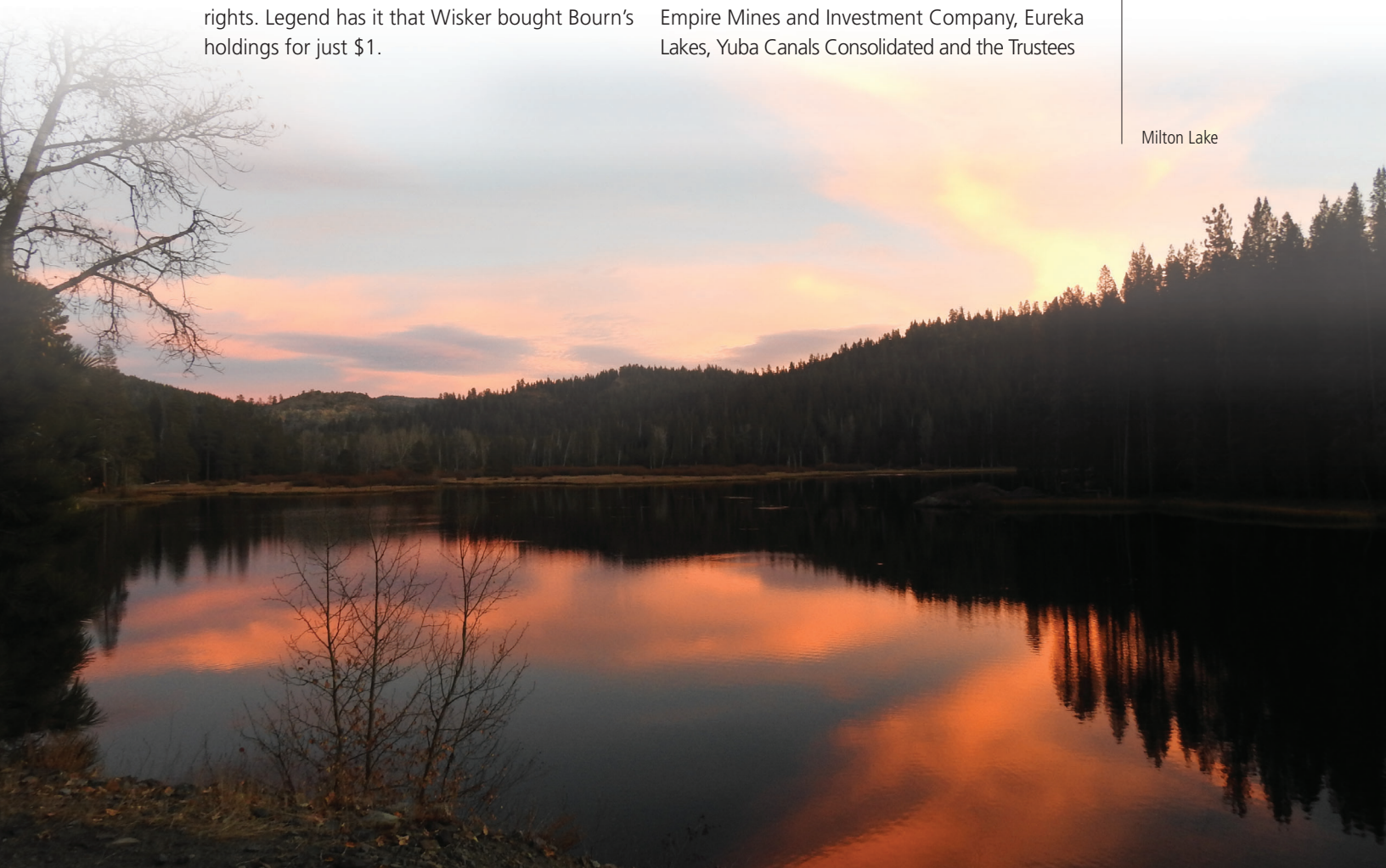
Wisker replied with a twinkle in his eye, "Why, I'd give it to you. The canal, pit and mining would be yours. All I want is the water rights and the reservoirs upstream. I'll sign whatever documents to ensure that forever you will have water for that gravel operation."

It was an offer that Bourn couldn't refuse. On behalf of NID, Wisker purchased the holdings that included all of the North Bloomfield dams, reservoirs and canals with all the pre-1914 water rights. Legend has it that Wisker bought Bourn's holdings for just $1.

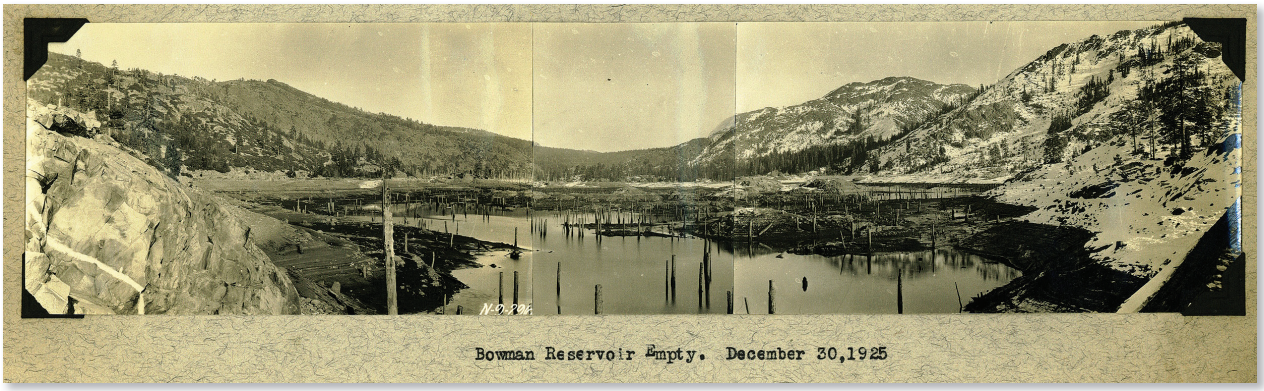
In the 1956 interview, Wisker expressed special pride in having acquired numerous valuable properties that would later become a key part of a water supply agreement between NID and PG&E that would finance development of much of the District's public water system.

As he looked back, Wisker recalled a conversation with Sam Eastman, who served for years as William Bourn's business manager: "That's the only time in my life that I ever knew Bill Bourn to make a business blunder," Wisker recalled Eastman as saying. "Bill should have accepted that million dollars, because he has never done anything with the hydraulic mining properties."

With the acquisition of the Bloomfield ditch by NID, Bourn could not get water to his mining interests on the San Juan Ridge. Bourn negotiated with NID to acquire the Bloomfield Ditch and terms for a water supply to the ditch for his mining interests and agreed to transfer to NID all rights to French, Faucherie and his interest in mountain lakes that fed them along with real estate relative to English (Rudyard) reservoir. From the Board of Directors meeting on December 17, 1925, the minutes read: "NID signs contract with Empire Mines and Investment Company, Eureka Lakes, Yuba Canals Consolidated and the Trustees



Milton Lake



Bowman Reservoir was drained during construction, December 1925.

of Summit Water and Irrigation Company. District offers to furnish to said Empire Mines and Investment Company 'free of charge for the years 1926, 1927 and 1928, water through the Bloomfield Canal for mining purposes.'" On February 13, 1926, the District acquired the deed to French, Sawmill and Faucherie reservoirs and the English properties from Empire Mines and Investment Company.

In 1925 NID also acquired the Excelsior Water and Power Company system, a vital link to bring water from the High Sierra to customers in the foothills. Originally a small ditch company that began operations in the mid-1850s as the Excelsior Canal Company in Smartsville, it expanded via mergers to become a powerful mining and water company. Excelsior had incorporated all water claims and ditch companies south of the South Yuba River, except those of the South Yuba Canal Company. Excelsior Water and Mining Company (name change in 1877) supplied the entire mining district from Nevada City to the edge of the Sacramento Valley "bountifully" with water, "the great secret underlying the profit" of these mines, according to the U.S. Mining Commissioner.

An additional purchase in 1925 included the Deer Creek water system from PG&E, consisting of water rights on Deer Creek and water distribution infrastructure in the form or canals, ditches, flumes and siphons.

The series of purchases of high-country reservoirs and delivery conduits, as well as securing vital water rights, gave NID control of some of the most valuable water storage infrastructure of the time. Purchasing the properties enabled the District to provide a reliable source of water, initially stored in high country reservoirs and then transported to the foothills.

Starting at French Lake, water flows 1.2 miles northwest below the dam via Canyon Creek, where it enters Faucherie Lake. Then, 1.4 miles further northwest, it enters Sawmill Lake before continuing another mile to the northwest and entering the largest of the four reservoirs, Bowman Lake. Canyon Creek then proceeds to plunge nearly 3,000 feet in elevation in just 9.1 miles through a steep canyon before its mouth at the South Yuba River at an elevation of 2,800 feet, just 2.6 miles due east of the town of Washington.

In order to transport the water from these newly acquired assets to NID's service area and to PG&E's Drum-Spaulding facilities, the Milton Diversion Dam, Milton-Bowman Tunnel and the Bowman-Spaulding Canal needed to be constructed. 1926 was a busy year: Construction began on the Bowman-Spaulding Canal; NID purchased the Parker Reservoir site on the Bear River and also the Tarr Ditch and its water rights. Construction projects were under way at Bowman, Milton, Lower Scotts Flat and Combie.

Bowman Dam is raised

Bowman Dam (elevation 5,500 feet) is located about 40 miles northeast of Nevada City. The dam was California's second rockfill dam, built in 1872 to supply water for hydraulic mining, including to Malakoff Diggins. The dam's upstream face was constructed with rock-filled timber cribs and sloped 60 degrees for the first 30 feet, and then 45 degrees on both the upstream and downstream faces. Originally built at 86 feet high, when the dam was raised to 107 feet, it became the highest dam in the world between 1880 and 1888.

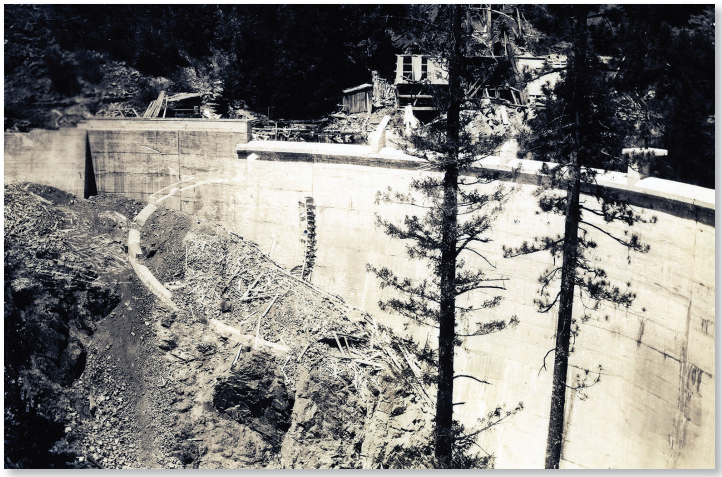
The dam held back water fed by Canyon Creek, a major tributary of the South Yuba River, in a reservoir that could hold about 21,350 acre-feet of water. NID had plans to make the reservoir the primary water supply for the new District. Once purchased from Northern Water and Power Co., the dam needed to be upgraded and raised, an expensive move that the new directors entirely supported. Financing was made available through the $7.25 million bond, passed by voters in 1925.

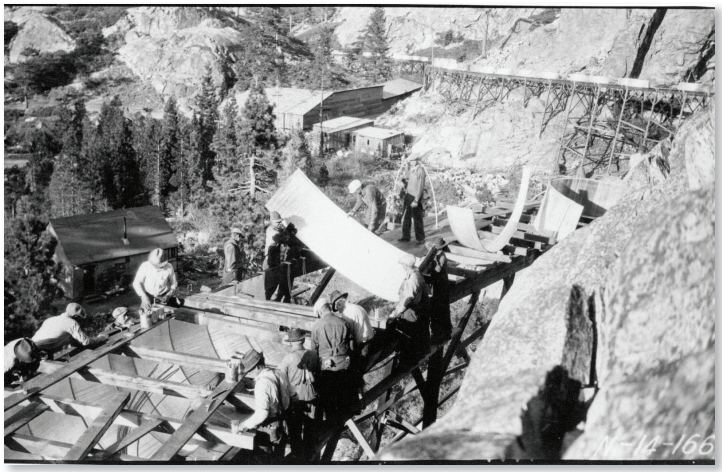
The District hired Warren A. Bechtel, the founder of the today's major global engineering firm with the credit of being one of six companies that built Hoover Dam in the early 1930s. Shortly after Bechtel, his three sons and brother joined to incorporate as the W.A. Bechtel Company in 1926, NID granted the new company its first major contract to construct the Bowman Dam.

The construction site was so remote, with snow-pack lasting nearly six months out of a year, the Bechtel Company needed to establish a camp complete with a hospital, a hundred head of cattle and a slaughterhouse and storage facilities to sustain the crew for the winter. The work was impressive; crews went to work to dismantle the existing timber infrastructure and replace it with a larger rock-filled dam that was porous yet also used firmly packed gravel and sand with an area of concrete to completely block the water. When complete, Bowman stood at 176 feet high. It was the world's second-largest rock-filled dam and had a capacity of 68,510 acre-feet of water.

In the January 1927 edition of the Pacific Service Magazine, published by PG&E, the editor noted the importance of Bowman Dam and Reservoir: "… the central and most important of the system is Bowman, situated on Canyon Creek, a tributary of the South Yuba. Bowman is the chief of a smaller cluster of reservoirs lying under a ridge separating the Middle Yuba watershed from that of the South Yuba.… As a matter of fact, Bowman reservoir itself was built more than a half a century ago and was long used as a source of water supply for the North Bloomfield hydraulic mines. It has two dams, at separate openings, and the work now consists in replacing these old timber-crib relics of the '70s with

The concrete Bowman South Arch Dam was taking shape on October 29, 1926.





Workers toil to construct the flume on the Bowman-Spaulding Canal.

A crew works to construct the north portal of the Milton-Bowman Tunnel on July 12, 1926.

modern structures. The main dam now in process of construction is to be of rock-fill type, 176 feet in height and 680 feet along the crest, while the second dam, which will be used as a spillway, will be a concrete structure 117 feet in height and 430 feet in crest length. This work will result in the development of a storage reservoir of 65,000 acre-feet estimated capacity."

The editor also noted NID was "under obligation to deliver to our company 108,000 acre-feet of water from July 1 to March 1 of each year, from which the minimum annual revenue from power to the district will be $370,500."

The rebuilt and enlarged Bowman Dam was dedicated by Kate "Ma" Church on June 29, 1927. She broke a bottle of clear mountain water against a plaque on the crest of the rebuilt Bowman Dam, hidden valves opened below and, as reported in The Union newspaper, "a great column of silvery water gushed forth the bed of Canyon Creek on its way to Lake Spaulding."

The Bowman Dam dedication in 1927 drew an enthusiastic crowd.

These were the words Kate Church spoke: "To the completion of the work of our pioneers…the use of cities that are yet to be… to the tireless wheels of industry… to a richer rural life… to a greater measure of prosperity… to a higher standard of living… to a fuller realization of happiness… and to the maximum service of humanity. The great works and the life-giving waters of Nevada Irrigation District are here irrevocably dedicated… Here and now, I dedicate these waters to the service and constructive purposes of man in his pursuit of the useful arts of peace in this generation and in the generations to come."

Bowman-Spaulding Canal construction

While the pieces of the water source puzzle were coming together, NID realized it needed to connect its mountain reservoirs to PG&E's Lake Spaulding, where water could then be routed to customers in both Nevada and Placer counties. The answer was the construction of the Bowman-Spaulding Canal, which carried water from smaller upper reservoirs through Bowman Reservoir about 11 miles down to Spaulding Reservoir, where flows could be diverted downstream. The undertaking was enormous.

The conduit, which began at the Bowman Afterbay Dam, was constructed with a flume mounted on wooden trestles and bents, wooden siphons and unlined canals, which were all vulnerable to damage by snow and rockslides. The new Bowman-Spaulding infrastructure included three half-mile tunnels and nine miles of canal by which the water from Bowman could be carried to the upper end of Lake Spaulding. There, the water was used to turn the wheel of a new hydroelectric powerhouse on the rim of the lake, known as Spaulding No. 3.

The first tunnel was 1,400 feet in length, with a 12-by-12-foot horseshoe cross-section that started at the Bowman Afterbay Dam. A gunite (a concrete slurry used for lining) canal 1,200 feet long followed, terminating at the head of the second tunnel, which was 7,500 feet in length. The second tunnel terminated at another

The Bowman Dam was completed in 1926, and could store 65,000 acre-feet of water.

gunite canal immediately above Texas Creek. Two short tunnels and a small concrete gravity dam across Texas Creek connected by yet another canal connected to the Jordan Creek Siphon, where the water flowed through a gunite canal reaching to the head of the penstock to PG&E's Spaulding No. 3 power plant at Lake Spaulding.

NID's water was split at Lake Spaulding, and 105 cubic feet a second (cfs), more than 785 gallons per second, was delivered through PG&E's South Yuba Canal, flowing to Deer Creek and Scotts Flat Reservoir and through the utility's Drum Canal and the Drum power plant located on the Bear River. The capacity of the Drum Canal was 700 cfs, or 5,236 gallons per second.

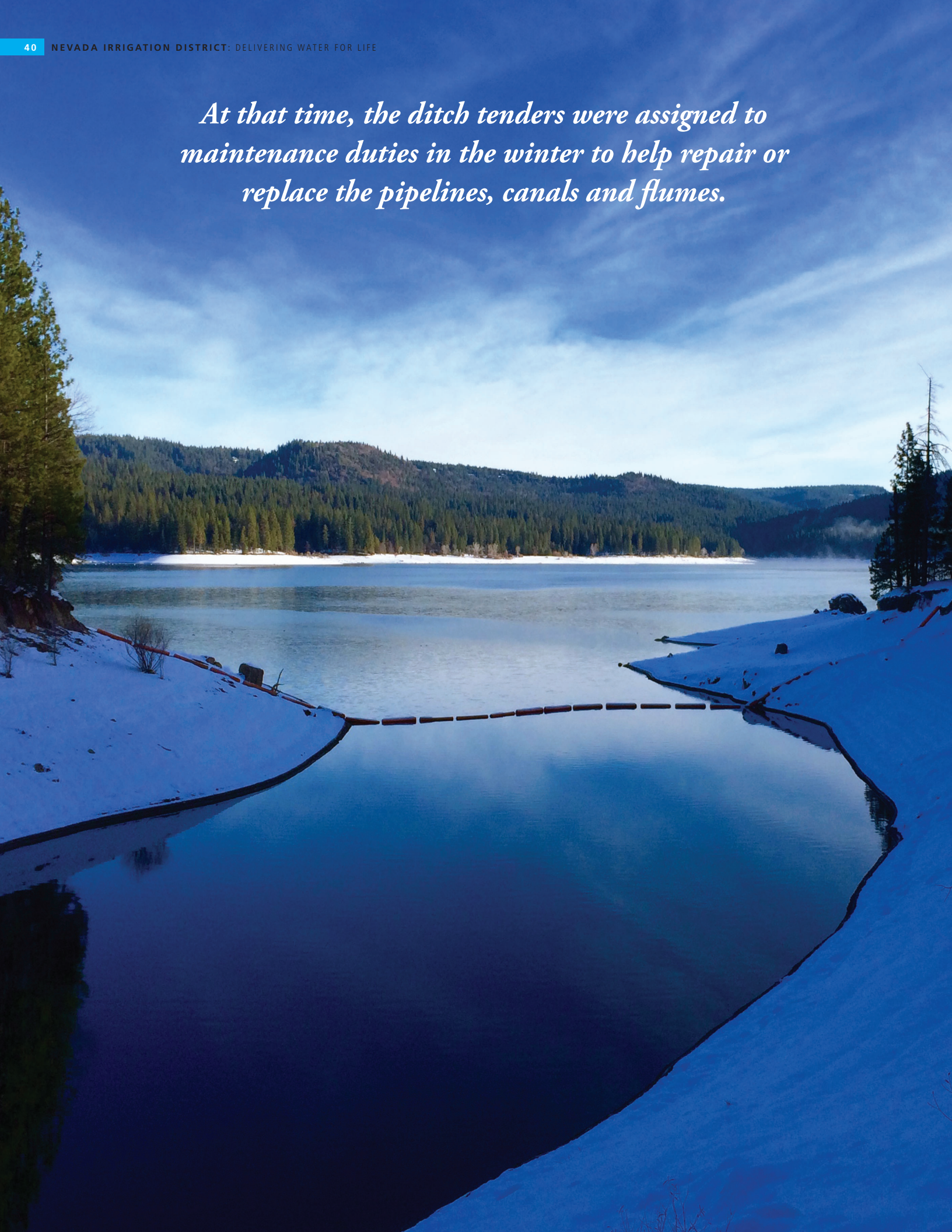
"This newborn year of 1927 promises well. Fall rains drenched our State from end to end and laid good foundation for a solid wall of snow on the mountain tops. It looks like a long, open winter, and if early promise holds out there will be crops a-plenty and good water for the farmer during the irrigating season," the Pacific Service Magazine noted. "These are the days of active construction work in every section of 'Pacific Service' territory. New projects are in process, and with our steadily increasing population and agricultural and industrial growth there is an ever pressing need for extensions and betterments of distribution facilities, both gas and electric.

"A deal of important reconstruction work will be in order in the spring to prepare the Spaulding-Drum system for the additional water supply that after use for power generating purposes will give sustenance to the deciduous fruit lands of the foothill country round Auburn and Newcastle. This Spaulding Drum system comes into prominence again through our company's agreement with the Nevada Irrigation District."

Placer County joins in 1926

At its formation, NID included 202,000 acres in Nevada County. Five years later, in 1926, residents of Placer County chose to join the District, and another 66,500 acres were added. Today, NID includes more than 287,000 acres. Following its formation, the District achieved rapid progress in laying the groundwork for the new public irrigation system. During the 1920s, many important water rights were obtained, key water rights the District retains to this day. The acquisition of land to store and deliver water was a very important step in the District's development. ■

At that time, the ditch tenders were assigned to maintenance duties in the winter to help repair or replace the pipelines, canals and flumes.



CHAPTER 6

Building the Dream with Ditches and Canals

The community rallied around the newly formed District. In Chicago Park, community members pitched in to build their own ditch.

In the first years of development, NID acquired about 400 miles of ditches and canals constructed by hand during the Gold Rush to support mining efforts. These conduits were the lifelines that would bring water to farmers and ranchers in the foothills. Construction was started in the mountain regions, and existing distribution systems were purchased following the approval of the water rights applications by state and federal commissions. This included the approval by the Bond Certification Commission for the sale of the 1925 bond issue for $7.5 million. Ditch by ditch, NID built the backbone of its infrastructure.

Ditches required intensive physical labor. For example, during the construction of the Tarr Ditch, which NID purchased for $37,500 in 1926, The Sacramento Union newspaper described the efforts in its April 10, 1910, edition: "Superintendent (E.H.) Tarr of the Blue Point Mining Company has moved his camp of twenty men from the Penn Valley district to the vicinity of the lime kiln in Nevada County, where they will be stationed for the next few weeks. The men have been at work for months cutting a trench six feet across on the bottom and four feet high, large enough to carry all the water that would

NID canals show early engineering skills

One of the remarkable things about NID is a canal system that is entirely supplied by gravity-flow and dates back to the Gold Rush. Today's engineers marvel over the engineering skills exhibited 150 years ago.

The earliest canals from the high mountains down into the Sierra foothills were many miles long and were precisely planned and constructed. Some say that a drop of 10 feet per mile was the goal of early canal builders.

"They would visualize a path and create a general map," said Gary King, former NID chief engineer. "They had no aerial views or electronic survey devices to help them.

They used chains and grade. They would shoot the path, walk down it and walk back up. It was open land, rough terrain. There were no property lines. They would figure the contours and follow the natural contours.

They were very good at it; people don't realize how creative they were." Many of the flumes along the old canals were built by craftsmen who also worked in the mines. "They were bridge builders," he said.

King said that Fred H. Tibbetts, NID's founding engineer, had excellent skills that came into play in connecting the earlier Gold Rush era canals into the fledgling NID water system. "We have 475 miles of canals and all the major movement of water is by gravity flow," said King.

> flow through Wolf creek, from which the supply will come, at any time of the year. The object of the company is to get a supply of water to operate the old Blue Point gravel mine, which was in the courts for so many years on account of the owner, Patrick Campbell, working it by the hydraulic process. Tarr offers no explanation why the ditch is so large, and pays no attention to the scoffing of the farmers through whose places the ditch passes. The latter hope they will be able to irrigate their places during the summer, but they have been given no encouragement along this line and the general opinion is that Tarr will need all water he can get for his mine. The work was started two years ago, at which time Tarr brought in two hundred Greeks and started them at work on the ditch. The miners' union of Grass Valley went down and caused a strike among the men and within a week all the Greeks left and Tarr was obliged to abandon the work."

Examples of the major ditches purchased in 1925-26 include:

Rough and Ready Ditch, purchased by NID on December 1, 1925, from Excelsior Water and Mining Company, diverted water from Deer Creek through about 13 miles of earth ditch for irrigation, domestic, and stockwatering uses in the Deer Creek area. This ditch was constructed in 1850 and originally put into use in 1854 for mining purposes around Rough and Ready.

Newtown Ditch was also included in the 1925 purchase from the Excelsior Water and Mining Company. The ditch, originally dug and put into use in 1881, diverted water from Deer Creek through an earth ditch and wood flume to supply water for irrigation, stockwatering and domestic uses in the Deer Creek and French Corral areas. Excess water in Pleasant Valley Ditch is spilled into the Excelsior Ditch in the vicinity of Pleasant Valley.

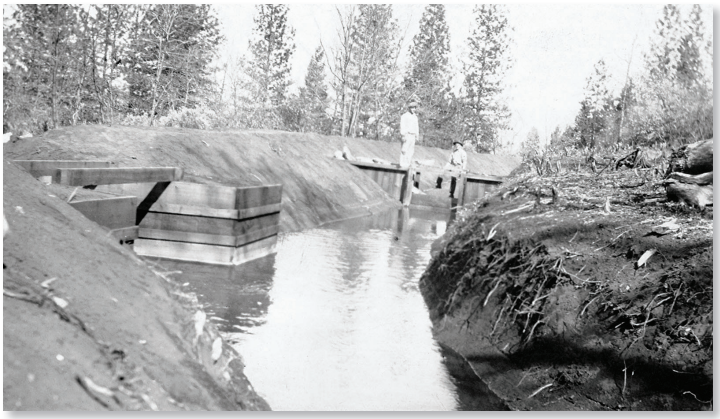
Excelsior Ditch, also part of the 1925 purchase from the Excelsior Water and Mining Company, diverted from the South Yuba River through 19 miles of earth ditch and wood flume, including its principal extensions, the Union, China and Keystone ditches that provided water for irrigation, stockwatering and domestic uses in the French Corral, French Dry Creek and Deer Creek areas.

Construction of the Excelsior Ditch began in 1856, and water was first delivered to the Smartsville area in the fall of 1859. At this time, the canal was known as the South Yuba Ditch, and the water diverted was used entirely for mining purposes. Shortly after the ditch was constructed it was decided to abandon that

portion of the ditch from its crossing of Deer Creek to its terminus and to carry the water to the mines by a different route. In 1860, China Ditch was constructed for this purpose. NID used China Ditch to divert water from the Excelsior Ditch to better serve customers.

Cascade Canal was purchased from PG&E on January 1, 1927. This ditch, dug in 1857 and first used in 1860, diverted water from Deer Creek about one-fourth mile downstream from the Deer Creek Powerhouse through 19 miles of earth ditch, wood flume and pipeline. From its diversion point, the ditch carried water to the Empire Reservoir, located about 3 miles east of Grass Valley near today's Nevada County Air Park. The reservoir regulated the flow, then released into the Big Chicago Park Ditch, which divided to form the Rattlesnake and Chicago Park ditches. Rattlesnake Ditch served the area between Wolf Creek and South Wolf Creek with its laterals, the Cunningham, Kyler, Union Hill, White, Forest Springs and Stockton Hill ditches. Chicago Park Ditch followed the ridge between Wolf Creek and Greenhorn Creek and terminated near Mt. Olive.

The headgate of the Drescher Flume was part of the Chicago Park system.



The Drescher Flume in Chicago Park was replaced in 1926.

Ditch tenders keep the water flowing year-round

To keep the water flowing, tireless workers – called ditch tenders – were charged with around-the-clock monitoring and maintenance. Answering an emergency call in the middle of the night to remove a bundle of sticks and leaves from a ditch by hand was exhausting, relentless and necessary work. But without ditch tenders to clear the District's open irrigation canals and ditches, water wouldn't make it to farms and the system would fail.

In the early days, ditch tenders and lake tenders were stationed every five to six miles along the ditches of many hydraulic mining operations. Some lived in housing provided by the mines at the mountain lakes. Because they had to be on duty 24 hours a day to patrol and regulate the water, an innovative device was employed at night to monitor the ditches. A large float was thrown into the ditch and was attached to a rope that went through a pulley strung into the tender's cabin. The rope was tied to a shelf, and tinware or other noisy objects were placed on the shelf. If the level of the ditch dropped, the float would also drop, pulling on the rope which pulled down the shelf with a crash. The loud noise would wake the ditch tender and he would rush to find the problem.

Later, ditch tenders began to patrol the domestic water systems, using soft pine to whittle plugs to fix leaking pipelines and sometimes throwing bales of straw into siphons to stop a large leak. The men also used what they called ditch walkers, which were whittled manzanita sticks. When they patrolled the ditches, they would throw a ditch walker into the water, and if it didn't end up on a trash rack several miles downstream in a reasonable amount of time, the ditch tender would hike upstream to find the problem and retrieve his trusty ditch walker.

Ditch tenders were paid between $90 and $115 per month. Other perks included housing and transportation, if the Board of Directors deemed it necessary. Also, if a ditch tender needed a

NID reservoirs and canals carry some unusual titles

NID has some colorful and unusual names of its water storage and distribution facilities. Unfortunately, the origin of many of them has been lost through the years. For example, was the Fiddler Green Canal titled after an early-day musician?

How Scotts Flat was named remains unclear, but many local residents feel it was because of Scottish miners who lived and worked there back in the 1850s and 1860s. Schools once stood near what is now the campground on the lake's north shore and at the site where the Cascade Shores General Store is now located. The area was a maze of mining claims when the potential reservoir site was first identified in 1913. A 140-foot tall dam was built in 1947, and it was raised to 175 feet in 1964.

Many NID facilities are named for people. For example, Rollins Reservoir was named for J.L. Rollins, manager of the Bear River Water and Power Co., the organization from which NID obtained the land to build the reservoir. In the high country, Faucherie Reservoir was named after a French engineer who worked for the Eureka Lake & Yuba Canal Co.

Other facilities are named for the geographic area they serve, such as the Bald Hill or Pet Hill canals.

What is the meaning of the initials in D-S Canal? It means Deer Creek South. NID built the D-S Canal in 1927-28. It follows the south side of the Deer Creek canyon from Lower Scotts Flat Reservoir toward Nevada City. If NID had followed through on an initial plan to build a canal on the north slope, we would be familiar today with the D-N Canal.

Nick Nicholson on patrol at Norton's Ditch Camp in 1937.

horse to perform his duties, an additional allowance of $10 per month for feed was provided. A ditch tender received one day off every three weeks, and could accumulate no more than two days of vacation a year.

Besides the daunting task of keeping the ditches and canals clear and flowing, the ditch tenders were also expected to file applications for water often having hundreds of dollars on them that they carried in small metal boxes.

Orville L. (Nick) Nicholson became one of NID's ditch tenders when he was 26 years old in 1936. Prior to working for the District, he worked for PG&E as a laborer. However, he resigned from PG&E because they wouldn't give him deer season off.

D-S Canal

Starting with NID as a temporary laborer in 1932, Nicholson was hired as a permanent employee in 1935 in the maintenance department. A year later, he became a ditch tender, ultimately in charge of the Grass Valley area. For his crucial work, he earned $110 a month, plus three cents a mile to cover expenses of driving his Model A Ford on patrol.

At that time, the ditch tenders were assigned to maintenance duties in the winter to help repair or replace the pipelines, canals and flumes. Nicholson's son, Les, recalled his father would leave the house in late October, with his 12-foot skis and pike pole, to walk or ski along the Cascade Canal. He stayed at the ditch camps along the canal, including at Norton's Camp located about one mile from Scotts Flat. On a daily basis, he would patrol the canal, using his pike pole to break the ice and snow in the canal in order to keep the water flowing.

Even today, NID employs skilled workers to patrol and maintain the vital ditches. The ditch tenders have evolved into multi-tasked Water Distribution Operators. Yet ensuring the District's conduits are clear and flowing is as vital today as in the early days.

The District's system began to be referred to as two categories: the Upper, or Mountain, Division and the Lower Division. The Upper Division was the source of the District's water supply, as well as the associated facilities for diverting and storing water upstream of Spaulding Reservoir. The Lower Division referred to water rights with sources and associated facilities downstream of Spaulding Reservoir. ■

"For the first time, abundant water from the mountains will be brought to the land under the complete direction and control of the land owners."

FRED TIBBETTS, 1927

CHAPTER 7

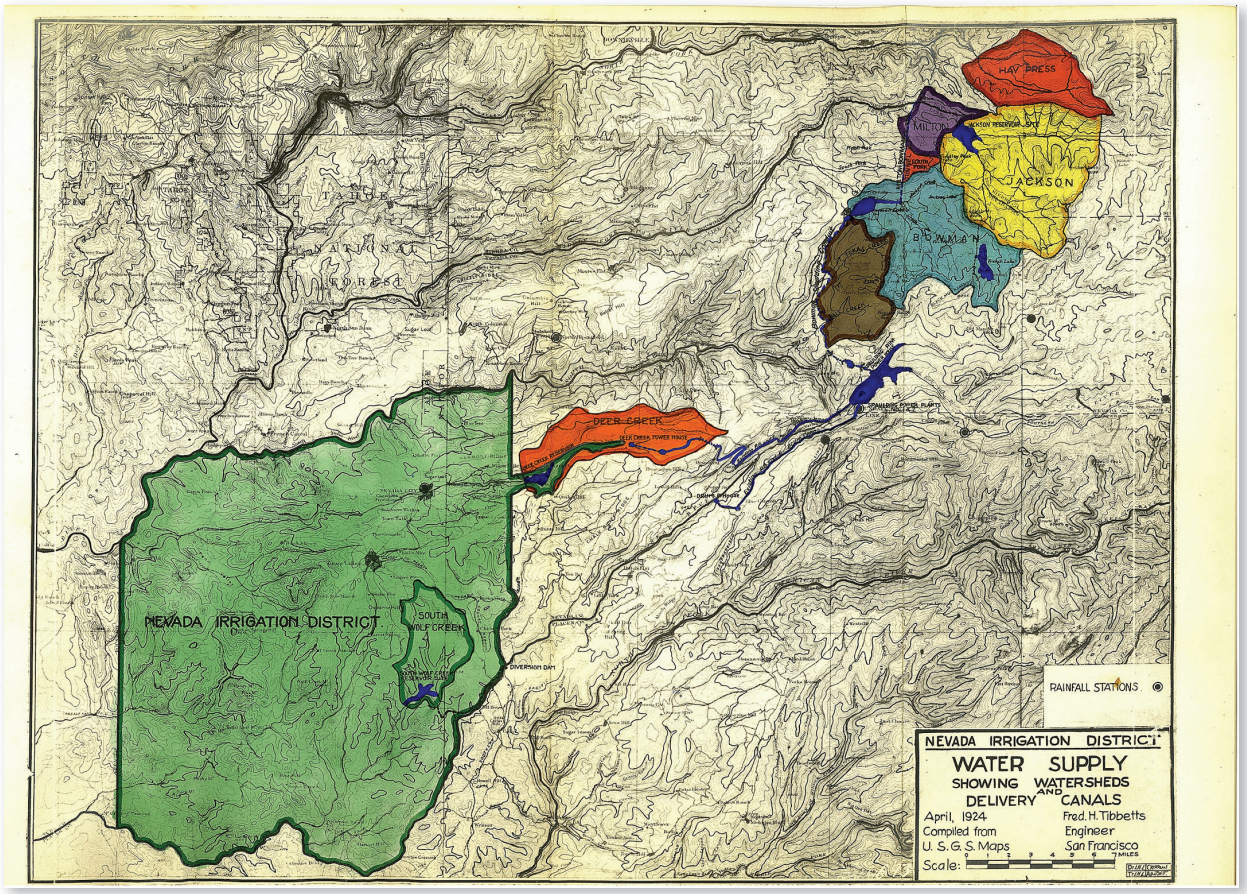
The First Water Flows to Customers

Fred Tibbetts addresses the crowd during the Van Giesen Dam dedication on May 12, 1928.

In 1927, NID was able to begin water deliveries with its own crews. Irrigation water was sold for $2 per acre-foot, about 10 cents per day. The year also brought acquisition of the Upper Deer Creek system and water rights from PG&E on January 1, 1927, for $350,000. After ensuring acquisition and development of the water systems needed to supply the community, Aubrey Wisker was at the helm in 1927 when NID became a functioning organization.

Fred Tibbetts discussed NID's progress during an April 19, 1927, speech to the American Society of Civil Engineers, San Francisco Section. He detailed three basic requirements for the District. These were: Free water at the head, reservation storage of sufficient water by allocation from the state and acquisition of established water rights, and a progressive scheme of development.

Tibbetts noted that early in its formation, NID contracted to supply water to Grass Valley and Nevada City, and that the 1926 addition to the District of 66,500 acres in Placer County would soon lead to an extension of water supplies into the Lincoln area.



Fred Tibbetts presented his watershed map during the April 1927 presentation to the American Society of Civil Engineers.

He defined NID as "a composite project for the development of a high mountain water supply for irrigation, the manufacture of hydro-electric power, domestic use, hydraulic mining and industrial power for quartz mining." He said total costs for building the District would total some $50 million.

"The Nevada Irrigation District was organized with a determination to secure free water at the head of its distribution system by selling its potential power resources for sufficient amounts to pay for the mountain developments necessary to reservoir the spring runoff and regulate the stream flow for irrigation," he said.

In his speech, Tibbetts also noted that by 1927 construction of the mountain division was about 87 percent complete, and NID had purchased or constructed about 275 miles of irrigation canals and laterals for distribution of irrigation water to District customers.

"Prosperity and progress are coming …"

Grass Valley's daily newspaper, The Morning Union, celebrated the completion of NID's mountain water works in a special 28-page Commemorative Edition on July 1, 1927. NID Chief Engineer Fred Tibbetts wrote an introduction to the edition, painting a picture of the area as "a rugged region of great scenic beauty and historic interest." He paid tribute to the workers who built roads, operated equipment and provided labor.

Tibbetts described Bowman Dam, the centerpiece of the water system network, as "the largest in California and probably the second largest artificial rockpile in the world after Dix Dam in Kentucky." The dam, he said, was built at the site of the old Bowman Dam (1872-76) that first served the mines of the San Juan Ridge. He said the old mining company records were invaluable in his studies and forecasts.

"For the first time, abundant water from the mountains will be brought to the land under the complete direction and control of the land owners," he wrote.

The special newspaper section also included several articles about the attractions of the region, including good roads, hunting and fishing, golf,

homes, banks and historic spots. Congressman H.L. Englebright, who was born in Nevada City in 1884 and was the son of W.F. Englebright, also penned a congratulatory message.

The coverage also spotlighted a new irrigation law, adopted May 21, 1919, that allowed irrigation districts to develop electrical power. This legislation enabled NID to move forward to become, at the time, the third largest irrigation district in the state, after the Imperial and Madera irrigation districts.

In his contribution, California State Senator Thomas Ingram lauded the practical combination of water and power, of agriculture and industry. "The economic principle involved is, in the opinion of the writer, destined to be far reaching and to play an important part in the development of the West," Ingram wrote.

After the aggressive push by the early officials at NID, the District had developed solid water storage infrastructure in the mountains, diversions and a means of conveying the water to the foothills. It also had secured a long-term contract for sale of the energy content of the moving water on such a basis as to amortize the full cost of the mountain works, thereby giving the agricultural lands at lower elevation what amounted to a free water supply. The mountain works included a 4-mile diversion tunnel, 85,000 acre-feet of storage, and an 11-mile conduit in rough terrain that required numerous flumes and tunnels. The irrigation distribution system included two large concrete diversion dams as well as many miles of canals and numerous structures. Total construction costs amounted to about $7 million.

In 1928, to further expand its distribution system in Nevada County, NID began construction of the Deer Creek Diversion Dam and the D-S Canal. The canal, with its various distribution laterals, supplies water for irrigation, domestic and stockwatering uses in the Deer Creek and Wolf Creek areas, as well as supplying water to the City of Grass Valley and a portion of Nevada City. The principal lateral from the D-S Canal was the Grass Valley Ditch, which supplied Allison Ranch Ditch and its laterals, the Cory, James and Lafayette ditches. Portions of the water diverted through D-S Canal were released for supplemental supply to other NID facilities. At the terminus of Grass Valley Ditch, water was released to Rough and Ready Ditch. At the ends of the Cory, James and Allison Ranch ditches, water was released to French Ravine and Wolf Creek for re-diversion by the Tarr and French Ravine ditches. The D-S Canal terminated at and released excess water into Little Greenhorn Creek, a tributary of the Bear River, for use in the Placer Division. This water was normally re-diverted from the Bear River through the Bear River Canal for use in PG&E's power system, and then returned to NID at several locations in the Placer Division.

NID Hydrographer Paul Wheatley depended on skis to take a snow measurement in 1926.

Snow surveys assist in predicting water availability

With infrastructure in place, the District began to monitor its water supply, beginning with the source of Sierra snowmelt. During the late winter and spring, every month a surveyor would ski or snowshoe to a site and measure the amount of snow. NID first began taking snow surveys on Findley Peak (elevation 6,500 feet) in April of 1927. Within a couple of years, surveyors also were trekking to Bowman Reservoir (elevation 5,650 feet) to measure snow accumulation. Bowman historically receives an average of 69.2 inches of precipitation annually. By comparison, the average in Nevada City (elevation 2,700 feet) is 56 inches and in Grass Valley (elevation 2,400 feet) is 52 inches.

Fred Miller

Say Combie as in "comb," not Combie as in "common"

Is it Combie as in "comb?" Or Combie as in "common?"

Most of the veterans around NID pronounce it Combie as in "comb," and it appears they are correct.

According to the authoritative guide, California Place Names by the late Edwin G. Gudde, the lake is named after a Frenchman named Combie (or Coombe) who reached the Bear River in mining days. Combie Crossing and Combie Ranch were named for him, but they were later inundated by the reservoir. On a side note, Combie is credited with introducing alfalfa to California.

A spokeswoman for the French consulate in San Francisco said Combie most likely pronounced his name as in "comb." She also pointed out that "comb" and "combe" are in the French dictionary, defined as valley, dale or dell.

The dam at Combie was built in 1928, and is one of NID's oldest. Its official name, however, is Van Giesen Dam (for the record that's "geese-en").

The compiled data has helped NID early managers and today's leaders predict runoff and water availability, and accurately plan water supply deliveries during the summer and fall months.

The District joined with State efforts when the California Cooperative Snow Survey Project was established in 1929. Today, the program includes more than 50 agencies, which collect, analyze and share snow data from more than 265 snow courses and 130 snow sensors located throughout the Sierra Nevada and Shasta-Trinity mountains. The findings help forecast seasonal and water year runoff for local areas and the state.

Looking to the South – the vision of Parker Reservoir and the construction of Combie Dam

In his earliest studies, Tibbetts identified a future Parker Reservoir site at the Parker Ranch on the Bear River downstream from today's Rollins Reservoir. The Parker dam was to have dual purposes: capture mining debris and store water for irrigation of additional lands either in Placer or Yuba counties.

As early as May 1924, NID's development plan of the Bear River included a diversion dam on the Bear River below Greenhorn River (Rollins), a dam on South Wolf Creek, and a diversion canal between the two. This initial plan was flawed because of the prohibitive cost to construct the South Wolf Creek Reservoir. In 1926, the District's Bear River Reconnaissance Project considered alternative dam sites to replace the proposed South Wolf Creek Reservoir. Four potential dam sites were investigated: Rollins, Combie Crossing, Dog Bar and Parker.

The California Debris Commission issued a report about the leftover mining debris lodged in the canyons of the Yuba and Bear rivers that signaled a substantial problem. NID was determined to find a solution to the issue of the leftover debris deposited by the hydraulic mines.

The Reconnaissance Project resulted in firm conclusions: The Rollins Dam site was not favorable because of the relatively steeper channel gradient compared with the other sites, and it would quickly fill with mining debris. The Combie Dam site was determined adequate, but the streambed was at an elevation of 1,500 feet, which is less than the optimal 1,700-foot elevation required to serve Penn Valley. The Dog Bar Dam site was adequate, but it was wider than the dam site at Parker, making it a more expensive option compared to Parker. Also, Dog Bar Reservoir storage relative to the dam height would be less than for Parker Reservoir storage.

The Reconnaissance Project declared the Parker Reservoir site the best and most economical reservoir site for storage of water on the Bear River. Based on its findings the project included results of a topographical survey of the potential inundation area and a cost estimate for a rockfill dam of various heights, ranging from 130 feet to 330 feet. In addition, a diversion tunnel was proposed from Parker Reservoir to serve Penn Valley.

Having expanded into Placer County and acquired the Parker Reservoir site in 1926, the

District waited for the proper timing and finances to pursue that large project. Yet the District continued to move forward with infrastructure to serve its new Placer County customers. As part of the expansion, construction began on the first dam on the Bear River, near Meadow Vista. NID purchased the water rights in what was then prime ranch land with homes nestled in the oak woodlands. The historic problem in the area was that the Bear River would flood and swamp the land, devastating agricultural enterprises.

With Tibbetts at the helm as Chief Engineer, construction of the Combie Dam began in October 1927. The contractor was the Morrison-Knudsen Corporation, a civil engineering and construction company that later was among the consortium of firms that built Hoover Dam, the San Francisco–Oakland Bay Bridge and the Trans-Alaska Pipeline. The dam was completed in May the following year, with the Board of Directors accepting the completed work during its May 10, 1928 meeting.

When the concrete dam was constructed and the reservoir created, the names of the two families with bordering properties stuck. The Van Giesen family owned the property on the south side of the Bear River, while the Combie family operated a ranch along the Nevada County side to the north. Ultimately the reservoir became known as Combie, and the 87-foot-high arch dam took on the Van Giesen name.

The dedication of the infrastructure took place on May 12, 1928, at the Woerner Ranch, two miles north of the Bear River in Nevada County. Tibbetts assured the large gathering of people that the reservoir would be a reliable supply of water for ranchers and farmers in its southern boundaries.

On a side note, the NID May 10, 1928, Board of Directors meeting minutes reflect that Manager Wisker had requested PG&E "to spill the maximum quantity of water into Bear River in order that Van Giesen Dam might fill as rapidly as possible" and look impressive for the dedication ceremony.

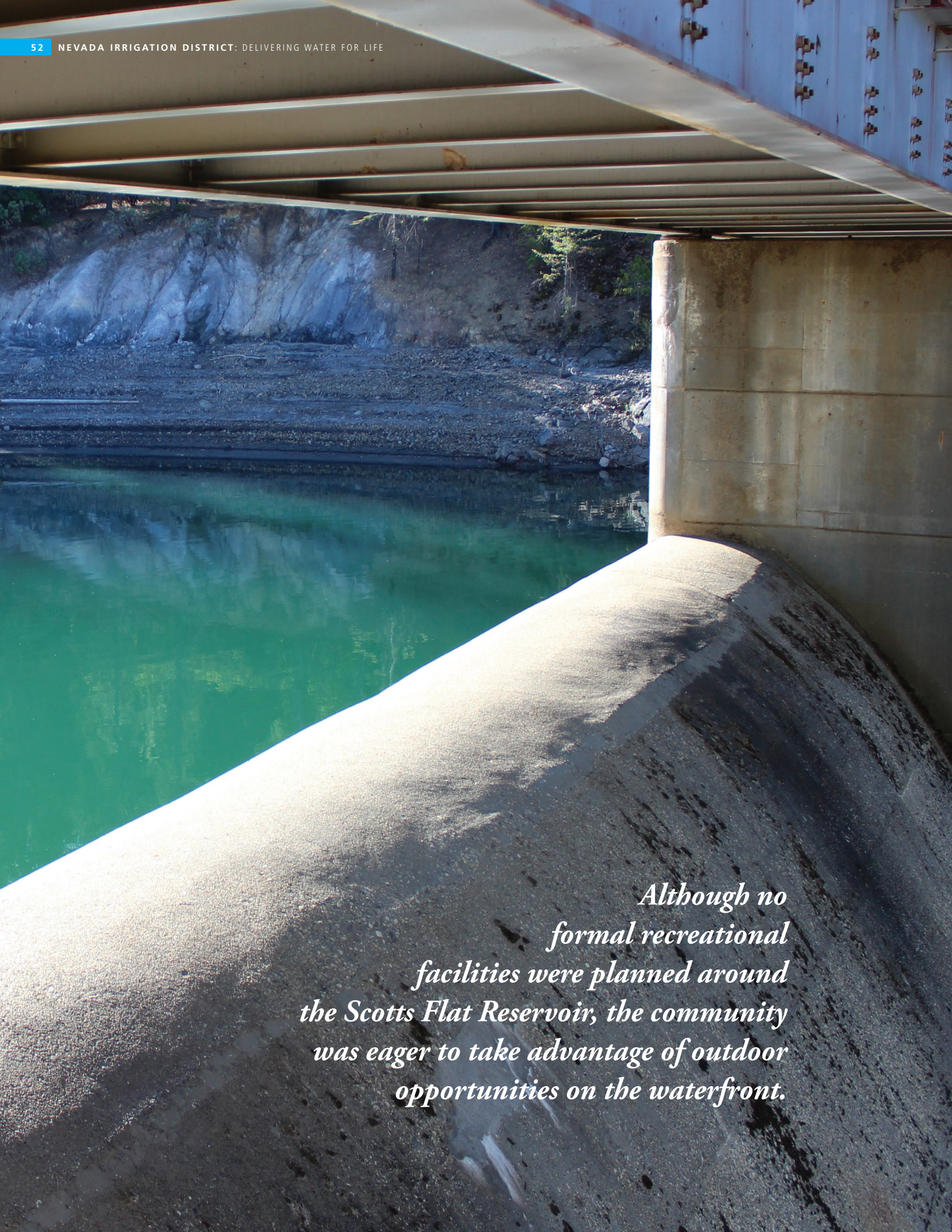
NID was on a roll. The District was taking shape, the water was flowing to farms and ranches, but 1928 also brought the resignation of District Manager Aubrey Wisker.

Much like today's snow surveys, the snow in 1929 was weighed to determine the water content.

Wisker was facing increasing political pressures, a growing community and an increasing demand to acquire property and water rights without proper compensation. He was paid $1 per month until the bonds were issued in 1925. The NID Board minutes of April 22, 1927, stated: "Wisker never got $1,000 per month. He was paid $833.33 per month for the 25 months after the bonds were issued. So, for the five years and eight months he served his pay averaged $306.80 per month."

He hit a breaking point. Wisker submitted his resignation several times. After his second letter, the Board minutes for July 6, 1928, read: "A Great Man Makes His Exit from the Stage of His Triumphs, Trials and Tribulations." The letter, dated July 5, 1928, read in part: "You have my best wishes in the solution of all problems relating to the District, and if there is any way in which I can in the future assist you in safeguarding the best interest of the people, I shall be happy to cooperate with you."

On August 3, 1928, Directors accepted Wisker's resignation, and released the official from his duties. In the absence of the first manager, NID continued to refine its practices, secure its water delivery system and increase the number of its customers. The tenured Board of Directors continued strengthening the new District, with Wisker's Assistant Manager Fred Miller now at the helm until 1929. ■



Although no formal recreational facilities were planned around the Scotts Flat Reservoir, the community was eager to take advantage of outdoor opportunities on the waterfront.

CHAPTER 8

The Durbrow Years and the Creation of Scotts Flat Reservoir

NID's headquarters on East Main Street in 1936.

By 1929 the District was supplying water. Despite tight budgets and financial difficulties, NID continued to expand its services.

Internally, Manager Fred Miller resigned from the position on August 7, 1929. The August 28 Board Minutes indicated that he stated that "he had been with the District four years without vacation and asked that consideration be given to granting him two weeks' vacation on pay."

In a quick turn-around, William Durbrow, an experienced agriculturalist who had served as Manager of the Glenn-Colusa Irrigation District, was approved by the Board on August 18, 1929, with a monthly salary set at $600. His employment started on August 22, 1929. His NID tenure, from 1929 through 1947, became known as "The Durbrow Years."

In addition, he was president of the Irrigation Districts Association from 1923 to 1933.

As he assumed NID's top management post, the District was finalizing the $5,000 purchase of 80 acres from Edward Van Giesen, owner of the land now occupied by Combie Reservoir and the Van Giesen Dam, which was completed in 1928. By 1929, having expanded into Placer County and acquiring the Parker Reservoir site in 1926, members of the NID Board envisioned selling water to Sacramento, an idea that would not materialize.

William Durbrow

Durbrow hardly had been in the managerial position before the U.S. stock market crashed that October. The impact was devastating, wiping out Wall Street and millions of investors. The Great Depression was the worst economic downturn in the history of the industrialized world, lasting from 1929 to 1939. Like the rest of the nation, California was hit hard by the economic collapse, and businesses failed, workers lost their jobs and families fell into poverty. However, while the rest of the country ground to a halt, Nevada County was insulated, thanks to its mining-based economy. The Empire Mine produced enough gold to keep residents employed and the local economy intact.

An NID crew works on the Gold Hill Flume in 1935.

During the Depression, agricultural lands, in general, declined. Although with the formation of NID and availability of irrigation water, a rapid expansion of agriculture took place during both the 1920s and 1930s. During this time, the California Division of Engineering and Irrigation reported that 11,704 acres were being irrigated within NID's boundaries. In Nevada County, the prominent crops were for forage, while only 30 percent of agricultural lands were orchards. Only one-third of Nevada County's portion of the District's distribution system was complete. In Placer County, nearly all of the irrigated lands were in orchards, but as a newcomer to the District, none of the county's distribution system was complete.

Meanwhile, District leaders wrestled with inequities in rate structures in Nevada County and the newly acquired lands in Placer County. In 1930, four years after the Placer County addition, Placer County ratepayers were paying nearly twice as much for water as their Nevada County neighbors. Placer residents were paying the PG&E rate of $45 per acre-foot while the NID orchard rate in Nevada County was $24.

In a University of California, Berkeley interview in 1957, Durbrow recalled his early days with the District. During the 1930s Depression, Durbrow said he focused much of his attention on negotiating and renegotiating NID's financial arrangements. A bond refunding in 1931 reduced the interest NID paid on its outstanding debt from 5.5 percent to 4 percent.

Despite the challenges, the District continued to grow. The Durbrow years brought a tremendous amount of ditch and pipeline construction to NID as local property owners clamored for public water supplies.

In 1933, NID purchased the Gold Hill water system in Placer County for $225,000 from PG&E, expanding District presence there. The acquisition included the canal and Bear River water rights dating to 1852, Camp Far West Canal and water rights dating to 1880, and Valley View Canal and Auburn Ravine system and water rights dating to 1851.

In August 1939 Congress approved a project for the development of storage facilities on the Yuba, Bear, and American rivers having a total estimated cost of about $7 million. On the Bear River, a dam was proposed to be constructed at Dog Bar, about six miles above the Combie Dam. The report noted NID built the Combie Dam on the Bear River in 1928, some 37 miles above the river's mouth and about 3.5 miles west of Clipper Gap. Debris storage space in the reservoir was sold to the mines above the dam until November 1938, when mining was stopped by court action. It seemed that water was diverted from the river at a point between the mines and the reservoir, and before there was an opportunity for debris settlement.

The report indicated, "The system of restraint will be continued until the rivers in their improved condition can carry the material brought down. The estimated cost of this improvement is: Dam on Bear River at Van Giesen's $150,000."

World War II impacts the District

The United States did not enter World War II until after the Japanese bombed the American fleet in Pearl Harbor, Hawaii, on December 7, 1941. Like elsewhere throughout the nation, young men and women were called to duty. Newspaper headlines warned about spies and communism. Food and necessities were rationed. To buy beef, a special coupon was needed.

Families' lives were forever altered in the foothills. And the economics of Nevada County shifted. Thousands of acres, including large parcels of irrigated pasture, were taken out of production by the expansion of Beale Air Force Base – originally formed as "Camp Beale" in 1940 near Spenceville to function as a training post. When the veterans returned from war to the fields and farms, many of them found higher paying opportunities. What's more, property became more valuable for housing than for farming, and large acreages were broken up into residential lots. More NID customers were connecting their properties to NID ditches. Reports began noting that some people were using ditch water as their domestic supplies.

NID continued to supply water despite a tight budget and 40 employees. In May of 1943, voters overwhelmingly approved an issuance of an additional $1.5 million in bonds to support the District.

Forrest Varney

After 18 years as Manager, Durbrow was ready to retire. When it was announced that a new Manager would be hired, the community turned out during the 297th regular meeting of the Board of Directors on August 8, 1947. The minutes of the meeting noted, "As there were so many people present the directors room was much too small to accommodate the crowd so the meeting adjourned to the Hennessey School …. Mr. Griffith, Chairman of the Committee which was appointed some time ago to select a new Manager, reported and offered the following resolution … and unanimously carried: Be it resolved that the Board of Directors of Nevada Irrigation District interview the men whose applications we have received and select a man to fill the job as Manager of Nevada Irrigation District." On August 16, 1947 Directors interviewed NID's Chief Engineer Forrest F. Varney, who would become the next Manager.

The construction of Scotts Flat Dam

While the process to find a new Manager was ongoing, a significant accomplishment of the Durbrow years was underway with the construction of a 135-foot-tall dam at Scotts Flat east of Nevada City. The $1.1 million dam would impound 27,700 acre-feet of water (today Scotts Flat, enlarged in 1964, holds 48,500 acre-feet). This infrastructure greatly improved water availability and reliability into the greater Grass Valley-Nevada City area. Plus, the reservoir would become a popular destination for outdoor recreation.

Early View of NID Headquarters

The Charles T. Brown Company was hired in 1947 to construct the dam. Directors received a report during their August 22 meeting that a test on material being placed for the earthen dam was satisfactory, and that progress was being made.

Newly appointed Manager Varney wrote in a letter to the board on October 10, 1947: "The District has scarcely begun its development. Barren, dry, gentle sloping fields are inviting the application of water to transform them into green pastures or blooming orchards. Water is the lifeblood of the state and no less vital to this region. Beneficial use is the criterion of water appropriation and it would be unfortunate if the District ever lost the rights it now holds because of continued non-use. Completion of Scotts Flat will help solve a great problem. … Parker Reservoir site on the Bear River must be used in the near future to insure water for the growth in population. Additional storage in the mountains must be provided to increase the amount to be needed in the lower regions."

Constructing the Scotts Flat Dam and spillway were quite the engineering feat, and Directors were kept apprised throughout the process. For example, during the November 11, 1947, meeting, after hearing that the concrete pouring for the spillway area was about to commence, Directors directed questions to the Contracting Engineer Harold Wood, of Blackie and Wood, about the use of materials and design features of the overall infrastructure. The meeting minutes noted: "With reference to installation of a three-foot pipe in the existing six-foot tunnel he stated that requirements by state specifications made it more economical to place a steel pipe through the central portion of the dam rather than placing reinforced concrete lining in the existing tunnel. The pipe was designed to provide adequate capacity for irrigation water deliveries even with a low reservoir. Consideration had also been given to provide an intake tower rather than the submerged inlet provided under present plans. Economy of construction dictated the latter as being preferred in view of the fact that no operational difficulties were anticipated."

Although no formal recreational facilities were planned around the Scotts Flat Reservoir, the community was eager to take advantage of outdoor opportunities on the waterfront. For example, on June 28, 1947, well before the dam was complete, a Girl Scout committee from Nevada City appeared before the board to request a camp site. The minutes noted: "It was the general opinion of the Board that there was no objection to such site providing it did not interfere with the District's construction or operation plans."

In April 1948 Jack Frank of the Grass Valley Sportsmen's Club requested the organization be considered should the Board of Directors adopt a policy of granting leases to individuals or organizations. During the May 14, 1948 meeting, the Board acknowledged its aim to make use of the District's facilities for public benefit. Directors unanimously approved a long-term lease to the Grass Valley Sportsmen's Club to build a clubhouse and provide for recreational facilities on the small bay at the north side of the reservoir immediately above the dam. The Club agreed they would abide by whatever regulations and would conform to Forest Service and state sanitary codes adopted by the District. ■

Workers construct the Reille Ditch in Placer County during the 1930s.

"NID will not fold up nor will people refuse to come to this beautiful mountain area because of the cost of water."

MANAGER FORREST VARNEY, 1949

CHAPTER 9

Tough Financial Times: 1940s and 1950s

A tree crashed into the Cascade Canal in 1952, leading to costly repairs.

The continued expansion of the District's infrastructure, including hundreds of miles of ditches and canals and the construction of the Combie and Scotts Flat dams, put NID in a fine position to provide a reliable source of water for decades to come. As the 1940s ended, NID had 2,870 customers and 88 full-time employees. Dozens more employees were being hired each winter for manual cleaning of the canals. However, the work to establish a new irrigation district was costly. Infrastructure was expensive: the construction, "betterments," equipment and property purchases from January 1, 1935, to January 1, 1946, showed a net expenditure from General Fund of $631,285.50.

What Directors didn't know at the time, which was to compound the challenges, was a turnover in management that would befall the District with four general managers dealing with the financially difficult years of 1947-1956.

Manager Varney had high hopes for the growth of NID, and worked hard to facilitate communication and cooperation between the District and its customers, while trying to improve the District's financial situation. It was a difficult balancing act. For example, the search for sources of revenue for the District aroused public indignation when assessment rates were raised, eliciting Varney to

Minasian law firm hired to help with water law

In the early 1950s, the District began a relationship with the law firm of Minasian and Minasian, located in Oroville, California. Specializing in water law, the firm was engaged to assist the District in perfecting the water rights and acquiring other state and federal permits necessary to allow the District to develop its Yuba-Bear Project. In addition to work required to acquire a 50-year federal license, the firm also negotiated the requisite power purchase and water supply agreements with PG&E, oversaw the work of financial specialists, negotiated engineering and other consultation agreements for construction, and acquired the necessary lands and rights of way to build and operate the project.

The firm has expanded since the early 1950s but continues to serve as the District's legal counsel. The work of the firm, now Minasian, Meith, Soares, Sexton & Cooper, LLP, has expanded its general counsel services to fulfill the legal needs of the District and the community it serves. Today, the firm provides the full range of legal services necessary for the District, including District governance, contracting, administrative law, labor law, construction law, environmental and natural resource law, occasional litigation and eminent domain law, along with assisting it to comply with the wide range of state, federal and local laws governing the operations of the District and its systems. More recently, the firm was engaged in the legal work necessary for the renewal of the required federal and state authorizations, associated land acquisition and power sales agreement necessary to continue to operate the Yuba Bear Project under a proposed second-generation federal license.

remark in 1949: "NID will not fold up nor will people refuse to come to this beautiful mountain area because of the cost of water."

By October, 1949, NID had $25,166.44 in the bank, which was not nearly enough to pay one month's expenses. The District continued to have trouble paying its bills, and publicly appealed to customers to pay their water bills so it would not have to borrow money to cover its operating costs.

As part of this outreach, the District planned and hosted a public tour of mountain water systems so members of the community could see firsthand the geography and some of the difficulties in operating and managing Upper Division water systems. Varney and the Board of Directors sent out the plea for financial assistance along with an invitation to customers to be part of an auto caravan to the mountains on October 22, 1949.

"The tour was planned," the invitation read, "with a view to acquainting you with the problem involved in transporting water from the watershed through the power plants to the irrigated areas and the residential portions of the district."

Varney clearly was frustrated. In a 1950 letter he noted, "The District finds itself in an embarrassing financial condition. Because of an accumulated indebtedness over a series of years and in order to provide increased revenue to eliminate this indebtedness and to meet its ever-increasing costs, it is endeavoring to find and stop the many 'leaks' which exist in the distribution system.

"It is natural that anyone who sees water running past his place would believe that he has a right to divert it to his use. Running water looks as 'free as the air we breathe,' but in this state water is used according to established water rights either on a riparian or appropriate basis. Within the District there are many who enjoy the free use of water under ancient appropriations or other rights.

"It is not the intention of the District to interfere with the use of water under established rights. The District assumes that each individual must establish proof of his right to use water from any streams within the District, or which is fed by District water. Where no actual right exists it is only fair that the District should obtain payment for water which it brings in the District through an elaborate and costly system."

As political pressure mounted, the Manager cautioned ditch tenders against entering into arguments with consumers and advised District employees to refrain from any politics concerning NID business. Even a sign at the customer service counter in the main office read, "We only work here, we do not make the rules."

Distrust between the Directors and from the public increased, adding to the worry about finances. Finally, on August 4, 1950, the Board meeting minutes noted, "At a meeting adjourned to the Memorial Building due to a large crowd which became a stormy session, Mr. Varney is asked to turn in his resignation effective September 1, by a vote of 3 to 2."

There was no official appointment of a new Manager until October 26, 1951, when NID's Chief Engineer Charles T. Law accepted the position at $750 per month. As the District's hydrographer originally hired in September of 1928, he was well aware of operations and challenges. Law was named "Agent of the Board, to act as a sort of manager on a temporary basis." By April 1952, he was replaced by August E. Kuiper, a civil engineer hired by the District in November 1951. Law was retained as a consulting engineer, but resigned in May 1952 due to poor health.

Even as NID was experiencing growing pains, the service to customers continued. By 1953 the District had 3,361 customers -- 2,314 domestic and business, and 1,047 raw water. Two years later, in 1955, NID was serving 3,852 customers.

"NID - Not Intended to Drink" - evolves

Charles Law

Into the 1950s, as population growth continued in Nevada, Placer and Yuba counties, more people were using ditch water as a domestic source, and there was a rising demand for chlorination. NID's first water treatment method was the injection of chlorine into some ditches. The District's first discussions with state public health officials on the growing need for disinfection, chlorination and filtration were recorded in 1952 as domestic use of ditch water continued. Kuiper worked with the State Board of Health to get

a water chlorination program established. NID water had always been "NID -- Not Intended to Drink, but the transition into the drinking water business (Now Intended to Drink) was beginning. It wouldn't be until 1957 when the District installed its first chlorinator, but an important foundation was established early in the decade.

Meanwhile, the District's internal strife continued. In January 1954 the Board abruptly dismissed Manager Kuiper with a 4 to 1 vote. The official reason was Directors wanted a manager who was also a licensed civil engineer to avoid the expense of two separate salaried positions.

However, it seemed the decision had been the outcome of turmoil and distrust within the District. It was proving difficult to find a manager under these circumstances. After Kuiper was unseated, a few offers were declined before NID Draftsman Edward C. Wells was declared the manager pro tem on May 28, 1954. The turnstile continued, and by November Wells asked to be relieved of his duties. T.D. Sawyer, a District engineer who was originally hired June of 1952 to help with heavy snow damage to District facilities in the mountains, took the helm pro tem on March 15, 1955, at a salary of $700 per month.

1956 Founders Day draws a crowd

On September 16, 1956, NID hosted a Founders Day Picnic at Scotts Flat Dam to celebrate the District's formation 35 years earlier. It was a large community event that featured NID pioneers, water industry leaders and political representatives. By this time, NID was valued at more than $25 million and had $6.55 million in outstanding bonds. At 268,500 acres, it was judged to be the second-largest irrigation district in California, but ranked 16th in development of its water resources.

NID promoted its Founders Day Picnic far and wide. Doyle Thomas headed the District's public relations outreach and prepared an assortment of printed materials. Advance notices of the event appeared in the Grass Valley Union, Auburn Journal, Tri-County News, Sacramento Union, Sacramento Bee and other publications.

"Founders Day is in honor of the determined men and women who against great odds succeeded in founding the irrigation district without

Bowman Lake

The "Mad Russian" of Texas Creek

One of the most colorful characters of the time was the "Mad Russian" of Texas Creek, Walter Proscurin. The solitary but likeable emigrant loved his vodka and garlic, talked to the animals and even kept a pet skunk during 13 years as a ditch tender at the isolated mountain station along Texas Creek, four miles southwest of Bowman Reservoir.

"He ate garlic like we eat bread," said Frank Plautz, who was NID's Bowman lake tender for 22 years. "He was serious. He wasn't much for joking. But he was a good-hearted guy. He always wanted to do something for you."

The stout, blond-haired Russian, who stood about 5 feet 10 inches and weighed 220 pounds, was responsible for keeping the water flowing through several miles of canals and old wooden flumes from Windy Point to the Clear Creek Tunnel.

Walter gained his nickname of the Mad Russian because of the way he would wave a rifle and chase hunters out of the Texas Creek area.

A loner and naturalized U.S. citizen, Walter lived alone in a stone and wood c abin on the bank of the Bowman-Spaulding Canal near its crossing at Texas Creek. Motorists traveling on Highway 20 in the 1950s and early 1960s could look far to the north and see a distant flicker of light from Walter's cabin. The light could be seen from the turnout on the highway just before the Washington turnoff. He used a gas-powered generator to light his cabin and power his television set. The cabin was equipped with a telephone that was often inoperable and a short-wave radio.

Walter, whose cabin was located beside a major deer migration route, became a friend to the animals.

"He would feed the coyotes," said NID retiree Jason Davis. "And I know he had a bear coming up there for a few years. He always kept a salt lick for the deer." "He fed the birds, too," added Ramona Plautz. "And he kept a pet skunk under his house."

which development of Nevada County and a great part of Placer County would have been hamstrung," noted a news release. "NID extends an invitation to every resident of Placer and Nevada counties, and residents of every county in the state to attend the picnic which may well be the biggest ever held in the foothill area."

The District planned an all-day, old-fashioned family picnic at the Scotts Flat Dam. A picnic ground was cleared and cleaned, and tables and a speaker stand were brought to the area, which would later become a public campground. There were games, races and historic photo exhibits.

With Board Chair E.B. Power of Lincoln presiding, the program recalled the dedication of Bowman Dam in 1927, which followed the District's formation by six years. Completion of Bowman allowed NID to begin the delivery of water to its customers.

Members of the community were joined by dignitaries from the water industry and political worlds. NID founding Manager Aubrey Wisker drew a loud ovation from the crowd. He said that much work remained for NID and that Parker Dam had the water and revenue potential to carry the District many years into the future.

Edwin Koster

Edwin Koster was the man behind NID's successful completion of the Yuba-Bear Hydroelectric Project. Koster was NID's general manager from 1957-1968. He was an up-and-comer in the California water industry who was recruited by the NID Board of Directors to lead a community effort to develop the water and power project.

Born in 1905 to a farming family in South Dakota, he moved with his family to a Modesto farm in 1919. His early career included positions with the State Relief Administration and the California State Grange. In 1947, he began the first of two terms on the Oakdale Irrigation District Board of Directors and served as board chairman during construction of the Tri Dam Project (three reservoirs and three power plants) on the Stanislaus River. He was appointed to the California Water Commission by Governor Pat Brown.

Koster joined NID July 1, 1957, and actively toured the District, promoting the water development to community leaders and groups and laying ground-work with PG&E, which would become NID's partner in the effort. He also brought in Ebasco Services, Inc., a widely respected engineering and design firm.

Others in attendance were Herman Graser, Nevada County's first farm advisor and key backer of NID's formation; Ira Collins, John Spaulding and L.R. Farrell of PG&E; Harry Lloyd, engineer of the city of San Francisco's Hetch Hetchy water works; and Robert Durbrow, son of former NID Manager William Durbrow, representing the Irrigation Districts Association of California (now the Association of California Water Agencies). Many of the local and visiting speakers had local family or career ties.

State Assemblyman Francis Lindsay told the audience that California was blessed with plenty of water and that it must be developed and distributed fairly and equitably, without robbing any area of its supply.

After the 1956 celebration, it was back to work at NID. District employees continued to work hard providing the Sierra snowmelt to the foothills. From the Upper Division to the lower elevations, the expertise of the staff kept the old mining infrastructure and new facilities operating in good order.

Bringing in a new era

Manager Sawyer had served the District well until February 25, 1957, when he offered his resignation. The request seemed to come as a surprise to the Board of Directors. Meeting minutes note that Chairman E.B. Power volunteered that he had attended an Irrigation District Association (I.D.A.) Executive Committee meeting in San Francisco on February 19, and on February 20 called on Ira Collins of PG&E, and Messrs. Stone and Bonte of Stone and Youngberg. All were disturbed to learn of Sawyer's decision and spoke with high esteem to his capabilities as Manager. The majority of NID Directors expressed regret that Sawyer was leaving as they felt he was a man of exceptional ability and experience and had done much for the District under considerable handicap. Director Carl Rolph commented that he regarded the resignation to be a result of incessant bickering, habitual and embarrassing inferences and, in his opinion, a man of Sawyer's high caliber did not have to tolerate it. His resignation was a definite loss to the District.

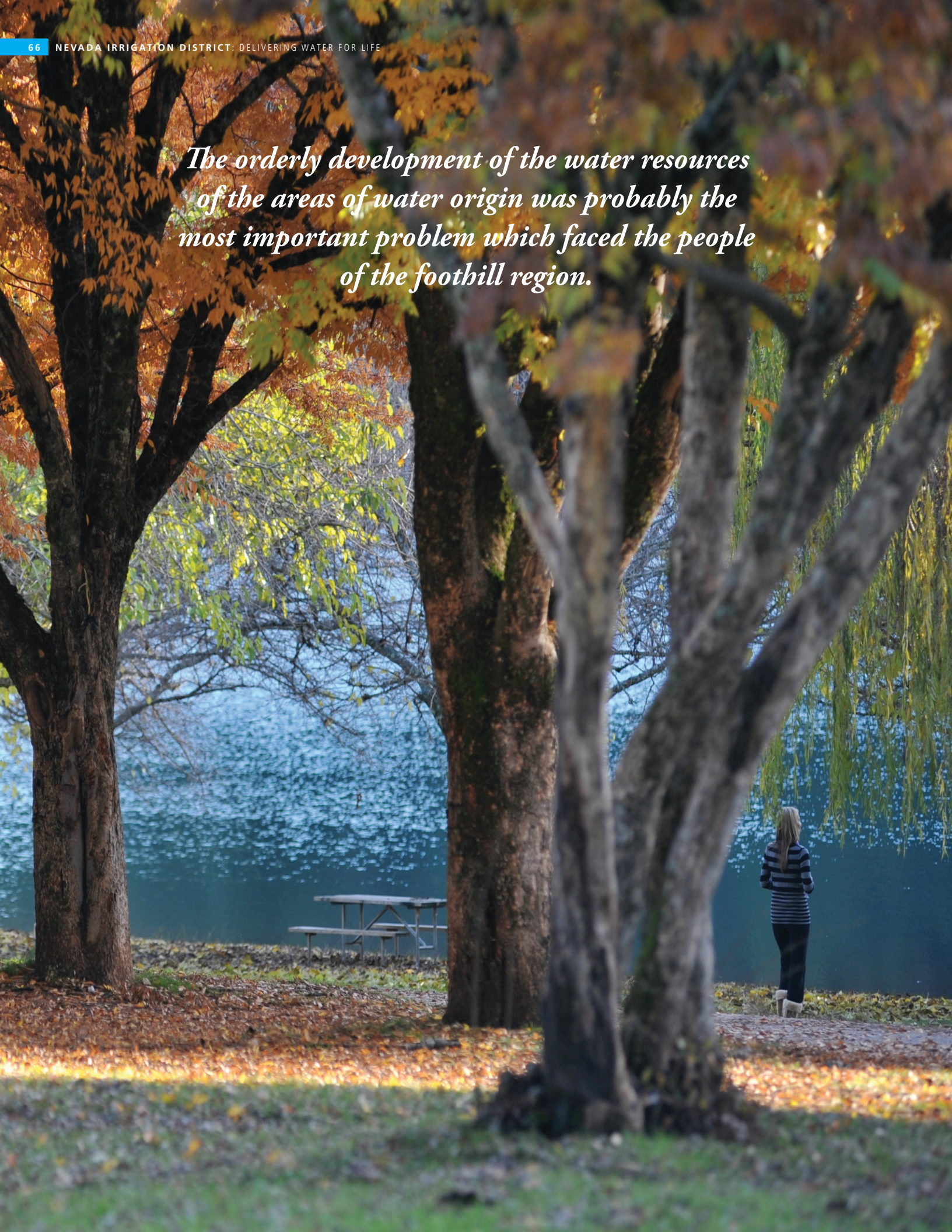
On April 12, 1957, Edward Wells was again made general manager pro tem until a new General Manager could be appointed. That did not take long, and an excellent candidate was found. Edwin Koster came to NID just in time for the District to make history under his confident leadership. Appointed General Manager on May 24, 1957, his primary vision from the onset was

Cattle were driven down Boulder Street, Nevada City, in 1950.

to begin the Yuba-Bear Project, a huge opportunity to produce power, raise revenue and bring the District out of its chronic financial challenges. The massive project on the Yuba and the Bear rivers would become the largest and most complex configuration of hydroelectric plumbing in all of California, encompassing about 400 square miles in Nevada, Placer and Sierra counties.

For the next 11 years, Koster was the driving force in taking NID to the next level as a reliable, far-sighted water supplier and hydroelectric producer. When he took the helm, the District still was focused on developing the Parker Dam site on the lower Bear River to Rollins and the upstream watershed. Koster toured the District, and after consulting with leaders, he seized the moment to change the direction of water development.

NID clearly needed to expand capacity to meet growing demand, but it lacked the cash to do so. At the same time, PG&E was interested in generating more power. With the support of the utility, a plan was developed to connect NID's water system to PG&E's Drum-Spaulding system, which started at Spaulding Lake and channeled water into Deer Creek above Nevada City and into the Bear River. By enlisting local community leaders and groups and laying groundwork with PG&E, including issuing bonds backed by the utility, the stage was set for a historic project that would forever change the way NID operated. ■

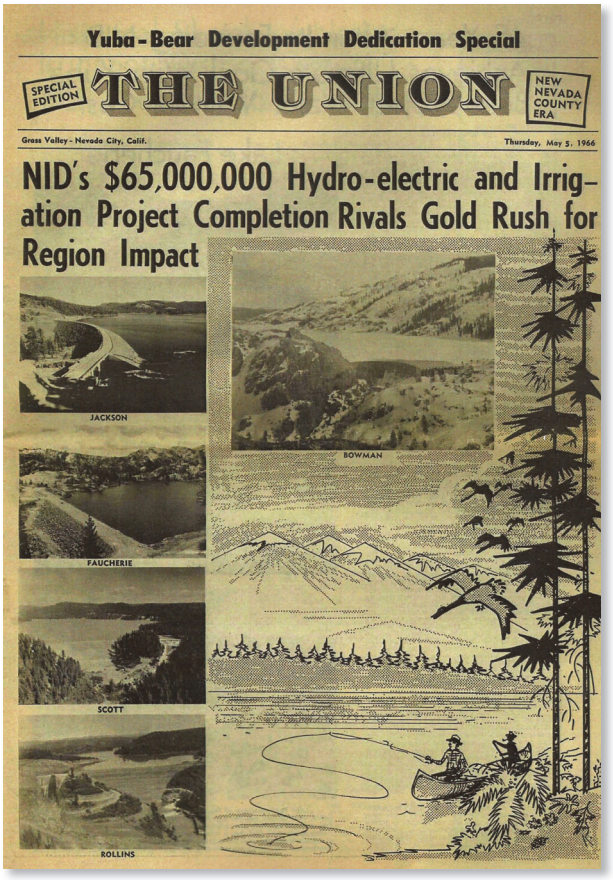


The orderly development of the water resources of the areas of water origin was probably the most important problem which faced the people of the foothill region.

CHAPTER 10

The Yuba-Bear Hydroelectric Project

NID develops its own water and power resources



Yuba-Bear Development Dedication Special

SPECIAL EDITION THE UNION NEW NEVADA COUNTY ERA

Grass Valley - Nevada City, Calif. Thursday, May 5, 1966

NID's $65,000,000 Hydro-electric and Irrigation Project Completion Rivals Gold Rush for Region Impact

JACKSON

BOWMAN

FAUCHERIE

SCOTT

ROLLINS

On Thursday, May 5, 1966, the front page in the Grass Valley Union newspaper blazoned the headline, "NID's $65,000,000 Hydro-electric and Irrigation Project Completion Rivals Gold Rush for Region Impact."

General Manager Edwin Koster took pen to paper in the lead story, boldly declaring "45 years after its founding NID achieves ultimate goal with Yuba-Bear Hydroelectric Project water without cost." The manager wrote, "To tell about the Yuba-Bear River development on the Yuba and Bear Rivers is a sizable and complex order when full consideration is given to the importance and magnitude of the project. What the Nevada Irrigation District has accomplished without government aid provides an additional 162,000 acre-feet of water storage for the irrigation and domestic needs of the District. Water stored in the District distribution reservoirs of Scotts Flat and Rollins are without cost to the water user."

The lead-up to the announcement began years before, with the recruitment of Koster. In a later interview, he recalled he took the managerial position at NID in July 1957: "So my job was to do something about getting something moving and the first thing I did was to talk to the Rotary Club. I made a little speech there, to the Rotarians, but I wasn't really talking to them, I was talking to Norm Sutherland, the President of Pacific Gas & Electric Company. I said, 'I outlined the way I thought we had to go. If that doesn't work, there are other routes that we could take.' Then I had a call from Mr. Sutherland and made an appointment to see him. He said to me, 'Ed, what do you think needs to be done?' I said, 'Norm, I really don't know. My friends, some of them, tell me that Jackson Meadows is a great place to build something. Obviously I've been there. It's a good dam site. It's rock from top to bottom; that's why there's water there that I know of. We might replace the old facility at Faucherie because there used to be a dam there on the Canyon Creek.' Then I said, 'I want to move away from what the other engineers have wanted to build, a reservoir at Parker. That's not the place to put it. The place to put it is at Rollins at the head of the Bear River Canal. At least it will do us some good, and I think it'll do you some good. That's where the diversion needs to be. We'll have some regulation on the Bear River, where your Bear River Canal is.'"

That conversation got the ball rolling. By 1958, NID and PG&E were involved in detailed planning for what would become the Yuba-Bear Hydroelectric Project, which would be built from 1963 to 1966 for $64 million, and remains the most significant project in District history.

Koster and the District Directors held the firm belief that hydroelectric energy production was the key to improving and increasing the efficiency and reliability of regional water supply, using the energy of falling water as it traveled to customers several thousand vertical feet down the mountains. The success of local hydroelectric production was already being proven by PG&E, in partnership with NID, and now it was time for the District to take its own place in the local power production network.

As a backdrop, by 1960, NID faced three major challenges. The first was in developing the hydroelectric energy potential of its mountain water systems. As part of this, the District needed to increase water availability to customers at a time when local reservoirs were running dry following peak usage periods. At the same time, the District needed to upgrade its domestic water systems that were coming under increasing scrutiny from state public health regulators who were calling for safer and more modern water treatment. The development of the hydropower system would help provide funding for a modern water treatment system to support the District's growing population.

The water and power project was studied for six years and included a detailed plan produced in 1958-1960 by Ebasco Engineering Services, Inc., a widely respected engineering and design firm formed by General Electric in 1905. In 1959 the initial engineering analyses were completed and the vision was about to become a reality.

The plan included eight reservoirs; 12 dams and diversions; four hydroelectric power plants; canals, tunnels and flumes; power transmission lines and roads; and recreation facilities that spanned a 400-square-mile area in Nevada, Placer and Sierra counties.

To finance the huge undertaking, NID proposed a $65 million (about $550 million in 2021 dollars) bond issue for construction. Under Koster's tireless leadership and promotion, community support mounted. In an August 7, 1962, election, NID voters overwhelmingly passed the bond issue by an overwhelming 97 percent support (2,225 to 59 votes) for construction of the project, perhaps the strongest show of support ever in a local election. Sweetening the deal, power generated by the project would be sold to PG&E, which would, in turn, repay the bonds issued to build it.

Importantly, the Yuba-Bear Project doubled the water storage available to NID customers, creating more than an additional 145,000 acre-feet of water storage as water supply and flood protection for the local community. The dry

reservoirs of late summer and fall would be only memories of the past. The water made available has helped make possible the lifestyle and economic success enjoyed today by the residents and businesses in Nevada and Placer counties.

Rollins Reservoir is a key component

The Yuba-Bear Project was, and still is, the largest single financial undertaking within the District to develop its own water and power resources. The construction of the 260-foot-tall gravel and rock-fill Rollins Dam and reservoir that could store 66,000 acre-feet of water was a major accomplishment. Located on the Bear River between Colfax and Grass Valley, the facility was designed to deliver water downstream for both irrigation and power use.

On August 24, 1963, 200 spectators gathered on the banks of the Bear River for a Yuba-Bear Project groundbreaking ceremony. The focus was on the demolition of the 196-foot high Nevada County Narrow Gauge Railroad trestle that crossed the Bear River Canyon at the site of today's Rollins Reservoir. However, despite all the planning and the explosive efforts of a demolition crew, the sturdy 810-foot-long trestle did not come down.

The Union newspaper reported, "The roar of two blasts resounded and clouds of thick dust rose and billowed. The bridge seemed to stretch, yawn a little, and then settle down to its original position. When the atmosphere cleared, the bridge appeared to be a little tired, but standing just as tall as its height allowed."

The ceremony proceeded, and the following day crews returned and brought the trestle down, using cables, tractors and burning torches.

Following the water

The Federal Energy Regulatory Commission (FERC) officially termed it Project No. 2266: "The Yuba-Bear Hydroelectric Project is located on the Middle and South Yuba River, and the Bear River in the Sierra Nevada Mountain Range. The Project involves the transfer of water from the Middle and South Yuba River to the Bear River basin."

The group participating in the signing of the paperwork to begin the ambitious Yuba-Bear Project included NID General Manager Ed Koster (back far right), Board Secretary Georgia Scoble (front left), and Directors Mel Brown and Vernon Vineyard (back far left).

Specifically, the Yuba-Bear Project plans identified the main water sources as the Middle Yuba River and Canyon Creek, which is a tributary of the South Yuba River. Jackson Meadows Dam, which stored water from the Middle Yuba River, diverts flows through the Milton-Bowman Diversion Conduit into Bowman Lake, an impoundment of Canyon Creek. In addition to Jackson Meadows and Bowman reservoirs, the Yuba-Bear Project planned to use water from 14 smaller high elevation Sierra reservoirs. The project proposed using flows that passed through the Bowman Powerhouse through the Bowman-Spaulding conduit to Lake Spaulding, an impoundment of the South Yuba River that was part of the interconnected Drum-Spaulding Hydroelectric Project owned by PG&E. Lake Spaulding was, and still is, an important hub of the system.

Below Lake Spaulding, water would pass through the Drum-Spaulding canals through Emigrant Gap into the upper Bear River, where it would power hydroelectric power plants on its long descent to Rollins Reservoir. Two of the hydroelectric power plants would be located at Dutch Flat No. 2 and Chicago Park.

The scheme was incredibly large; in fact, FERC deemed the Yuba-Bear Project and Drum-Spaulding Hydroelectric Project to be "the most physically and operationally complex hydroelectric projects in the United States."

Yuba-Bear Project: principal features

The construction work necessary for the Yuba-Bear Project was daunting, and focused on eight principal features:

Jackson Meadows Dam and Reservoir
A new rock-fill, earth-core dam was constructed at the headwaters of the Middle Yuba River

Milton-Bowman conduit improvements
The 1928 wood-stave pipe conduit was replaced with 3,300 feet of 7-foot-diameter steel-reinforced concrete. The Milton-Bowman tunnel was also repaired.

Faucherie Lake Dam
A new 40-foot-high rock-fill, asphalt faced dam was constructed on Canyon Creek.

Bowman-Spaulding conduit improvements
An existing metal flume portion of the conduit extending from Bowman Lake was replaced with a reinforced concrete flume and by 10,100 feet of tunnels. In addition, other portions of the conduit were improved.

Dutch Flat No. 2 Power Plant
A new outdoor power plant was constructed on the right bank of the Bear River with a generating capacity of 23,400 kilowatts. The five-mile long Dutch Flat Canal, which was to service this plant, was built primarily of reinforced concrete.

Dutch Flat Afterbay Dam
A new 175-foot-tall gravel-fill dam was constructed on the Bear River below the Dutch Flat Power Plant to impound 1,500 acre-feet of water.

Chicago Park Power Plant
A new outdoor power plant was constructed on the right side of the Bear River with a generating capacity of 37,350 kilowatts. A new four-mile-long Chicago Park Canal supplied water to the plant.

Rollins Dam
A new 260-foot-high gravel and rock-fill dam was constructed on the Bear River between Colfax and Grass Valley to create a new 825 acre-foot reservoir to impound 66,000 acre-feet of water. This was the lowermost structure to be built and served as a regulating reservoir to deliver water downstream for both irrigation and power use.

Construction of the Project begins

In 1963, NID and PG&E received new power licenses from FERC and entered into a 50-year contract through which NID would develop the project and market its energy production to PG&E. That same year project contractor Paul Hardeman, Inc. began work to construct the project.

"Without this contract with PG&E for the sale of power generated on this project, we could not have financed our bonds. As a result, additional water will be available without cost to the landowners of the District," Koster said in a later interview.

During construction, the project employed crews ranging from 300 to 1,000 people, who worked up and down the project, which stretched nearly 50 miles from its headwaters above Jackson Meadows near the Sierra crest to Scotts Flat and Rollins reservoirs in the Sierra foothills.
While the Scotts Flat Dam was not part of the Yuba-Bear Project, it was enlarged at the same time as the Yuba-Bear facilities were being constructed.

The October 1963 edition of Engineers News, published monthly by Local Union No. 3 of the International Union of Operating Engineers in San Francisco, summarized: "The Yuba-Bear River Project is off to a good start. The Paul Hardeman Inc. and Bedford Construction Co. Ltd., have numerous phases of this project under operation such as Jackson Meadows, Faucherie, Bowman Tunnel, Milton Tunnel, etc. The Ponderosa Contractors have the clearing well underway at Scotts Flat and Rollins Reservoir area, and John Tirey in the Jackson Meadows and Faucherie area. Gates and Fox moving right along on the diversion tunnels and have holed three at Jackson Meadows and are not lining same and meanwhile have gone underground at the Rollins site. Orville Constructors moving along on the roads into the Dutch Flat areas. The Granite Construction Co., who subbed the Scotts Flat & Rollins Dams, have a spread of pulls working one shift at present on the Scotts Flat Dam."

Ebasco Services, the engineers and construction managers, issued quarterly reports to NID throughout the project. After the first year of

construction, the September 30, 1963 report by Ebasco's Engineer in Charge Cecil Pearce noted, "substantial progress during the period ending September 30 was made on the Yuba-Bear River Development."

Significantly, the report noted that the Scotts Flat development was the farthest along of all the projects. The work focused on efforts to double the water storage capacity of the existing reservoir. "The main embankment of the enlarged dam was raised to its final elevation, and during the past three months all effort has been placed on raising the spillway dam to its crest. A bridge is being constructed over the spillway dam making year-round passage possible for the first time."

The report also detailed the progress of various projects. For example, "Beginning in April, crews returned to work on the 7,000-foot Bowman Tunnel No. 2, and have now driven to within 100 feet of the outlet portal. The 1,600-foot bench which will carry the 84-inch concrete pipe connecting the tunnel to the flume is being excavated."

"In May the raising of the diversion dam and flume intake and the construction of the flume crossing at Fall Creek was completed. Excavating and shaping of the canals was started from Clear Creek downstream, followed closely by the gunite crews. During this same period cleanout and repair was started on the existing Texas Creek, Clear Creek, Fall Creek, Rucker Creek and Zion Hill Tunnels and the replacement of the redwood siphon at Jordan Creek. During June, this work was completed as was the raising of the diversion dam and intake canal wall at Bowman Lake."

In addition, the report noted the Dutch Flat power production facility, which was to extend five miles along the Bear River from the intake tunnel at Drum Afterbay to a point opposite the town of Dutch Flat, was about one-quarter complete.

Four miles downstream from Dutch Flat was the site of Chicago Park, the second and larger of the District's power developments. From the Dutch Flat Afterbay, water would flow via an 18-by-10-foot rectangular flume to the powerhouse:

During the ground-breaking ceremony, despite the best efforts, the Nevada County Narrow Gauge Railroad trestle that crossed the Bear River would not fall.

NID Manager Edwin Koster inspects the work of Scotts Flat Dam on October 15, 1963.

"The flume bench has been excavated, the bridges are substantially complete and the crew was placing the concrete flume in 400-foot sections. The small reservoir in the flume line at Little York Diggins is complete. The forebay on the ridge above the powerhouse site is being excavated and the penstock intake structure and all the penstock foundation blocks have been concreted. Excavation for the powerhouse has been completed and concrete for the substructure is being placed."

The proposed Rollins Reservoir, the lowest elevation feature of the project, was designed to collect and store water previously used to generate

In 1964, construction of Rollins Reservoir was making progress.

power at the upstream plants for irrigation and domestic use. "With completion of the diversion tunnel and intake structure the Bear River was diverted from its normal channel at the site of Rollins Dam. The upstream and downstream cofferdams were then constructed allowing work to proceed on excavating the core trench and beginning the placement of rock in the upstream shell zone. ... Excavation is also continuing on the spillway approach, ogee section and spillway chute on the right abutment."

The report noted Scotts Flat development was the farthest along in the efforts to double the water storage capacity of the existing reservoir that served the northwestern section of the District's distribution system. The main embankment of the enlarged dam was raised to its final elevation, "and during the past three months all effort has been placed on raising the spillway dam to its crest. ... A bridge is being constructed over the spillway dam making year-round passage possible for the first time."

Yuba-Bear Project gains momentum

At the close of the second year of the Yuba-Bear Project, construction in the Mountain Division was nearing completion. The Ebasco report noted, "Water storage requirements under the contract with Pacific Gas and Electric Co. have been assured in the new and existing District reservoirs at the 5,000-foot level and above. This will guarantee adequate water to operate the District's power plants scheduled for completion at the end of the year. Other improvements as well as repairs to older existing facilities were also completed during the period in time to permit the District to meet the normal demand for water during the summer throughout its service area."

The report detailed that the Dutch Flat development included placement of the walls of a flume, which would be 14 feet wide and 7.5 feet high. The side spillway at the entrance to the Dutch Flat Forebay was complete, and the gates, guides and hoist at the penstock intake were complete. Construction of the Dutch Flat Powerhouse was about 80 percent complete. The forms had been constructed and concrete placed for the generator pedestal, and "the turbine and pressure regulator was installed and the generator is being assembled. Installation of accessory mechanical and electrical components is underway in the powerhouse and the oil circuit breaker and transformer have been placed on their foundations in the switchyard."

At the Bowman-Spaulding conduit project, 1,600 feet of 7-foot-diameter concrete pipe downstream of Tunnel No. 2 was completed. "Backfilling was carried on as the pipe was installed and the whole unit tied in to the system on June 26th. Downstream the water is carried in canals then through the completed Texas Creek tunnels and again by canal to the Jordan Creek Siphon.

NID workers inspect a segment of the old Bowman-Spaulding wood flume in 1964.

Guniting of the remaining canals was also completed during the final week of June." The report noted summer water deliveries from the upper division reservoirs were scheduled to start in July: "During the last week of the quarter all facilities received a final checkout and water was moving through the new and renovated sections of the Bowman-Spaulding Conduit on June 30th timed to reach the point of delivery at midnight."

In the final report, issued on September 30, 1965, Ebasco noted, "Twenty-seven months of construction progress have brought the Nevada Irrigation District Yuba-Bear River Development to 95% complete. Six of the major features of the project have been completed. Remaining are the powerhouses at Dutch Flat and Chicago Park, already past the 90% complete mark and scheduled for full operation on December 31, 1965. All Mountain Division units, dams, storage reservoirs and conduits, are already in operation. Starting in October water will be released through the Lower Division system to enable the testing and trial operation procedures to begin at the powerplants."

On May 5, 1966, when the Yuba-Bear Project was officially completed within the $65 million budget, General Manager Koster remarked, "What the Nevada Irrigation District has accomplished without government aid provides an additional 162,000 acre-feet of water storage for the irrigation and domestic needs of the District."

The new infrastructure signaled the start of NID's leading role in the state as a hydroelectric producer. Beginning in 1966 the Chicago Park and Dutch Flat powerhouses came online (with the Rollins powerhouse added in 1980). The addition of hydroelectric meant increased revenue. The 50-year bonds NID issued to build the project were fully repaid in 2012, while the project revenues continued to flow to the District for maintenance and upkeep of its complete power and water systems.

A two-day dedication ceremony of the Yuba-Bear Project was held on Friday, May 6, 1966, at the Grass Valley Veterans Memorial Building and on Saturday, May 7, 1966, at the Rollins Reservoir Overlook. The events were festive, celebrating the momentous accomplishment. From a water storage perspective, the project doubled the water storage available to NID customers. It also introduced organized recreation to NID's portfolio through a 1966 state Davis-Grunsky grant of $3.66 million for recreational improvements.

Recreation facilities open around reservoirs

The establishment of organized recreation at NID facilities, which was another component of the Yuba-Bear Project, was welcomed with open arms by the community. The Union newspaper on May 5, 1966, proclaimed, "Nevada County has always had a lot to boast about – such things

Frank Clendenen (middle) inspects steel framework to hold flume side forms to place concrete walls. Others pictured are Rex Reed (left) and Jim Brady.

In 1967, a family loads up the camping gear and boats, and heads to Scotts Flat.

as climate, varied elevation levels, four seasons, fishing and hunting spots, etc., but now that the Yuba-Bear River Development is completed, there's more reason than ever for being proud. The development is not only a credit to the county, but to the state as well."

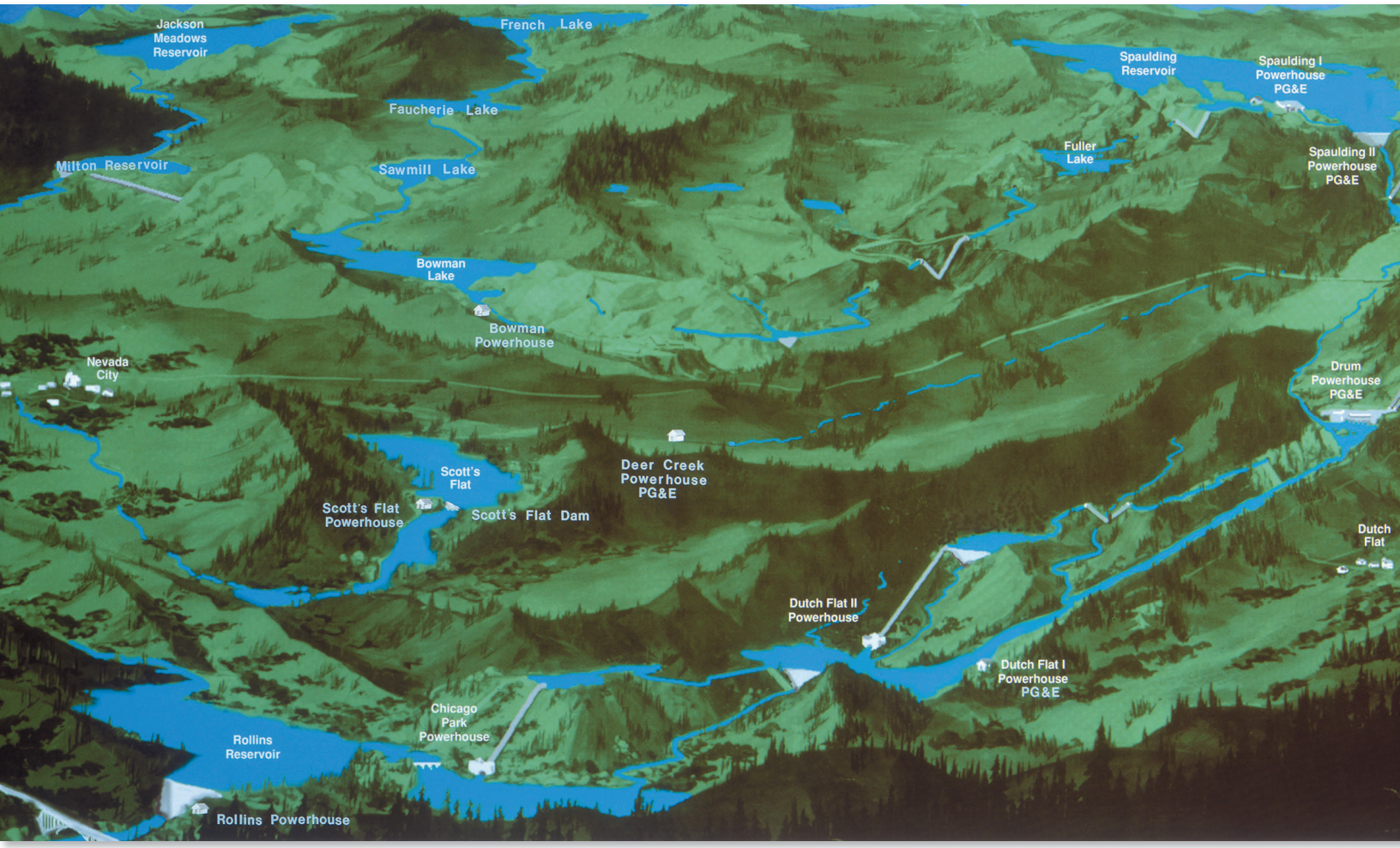
The article detailed the work: "An additional recreation facility program, when completed, will provide the county with a total of 312 picnic sites and 472 family camping units. The sites of Rollins Dam, Scotts Flat, Lake Faucherie and Jackson Meadows Reservoir, will be the location centers for the picnic and camping areas. Rollins Dam will have two double lane and two single lane boat ramps with parking provided for 25 cars and boat trailers each lane of ramp, 80 family picnic units and 86 family camping units, plus a swimming beach. Scotts Flat will have four lanes of ramp, 50 family picnic sites, 86 family camping units and two swimming beaches. Lake Faucherie will have five family sites and 20 family camping units. Jackson Meadow Reservoir will have one single lane and one double lane boat ramps, vehicle parking spaces, and 30 family picnic sites. Construction of benches, tables, and water facilities are now in progress. The completion date for the first start of the recreation planning is December 31, 1966."

In the same edition of The Union, Koster wrote: "The orderly development of the water resources of the areas of water origin was probably the most important problem which faced the people of the foothill region. The acuteness of the problem was aggravated by the fact that the people of California, during the past several years, have become conscious of the importance of water to their economy, and have been looking to all sources of water to support their economy.

"The Yuba-Bear River Water and Hydroelectric Project is solely owned and operated by the District. All physical features are unencumbered. It has added to the District's capital assets by more than $50 million, without NID customers assuming any economic risk in the repayment of bonds either in interest or principal. The Yuba-Bear River Development is the largest single financial undertaking within the District to develop its own water and power resources. The only other single event which may surpass this development was the accidental discovery of gold in the Mother Lode in 1849. The decision will be judged by historians in the years to come, but certainly the District's Yuba-Bear River project is the largest undertaking since 1900.

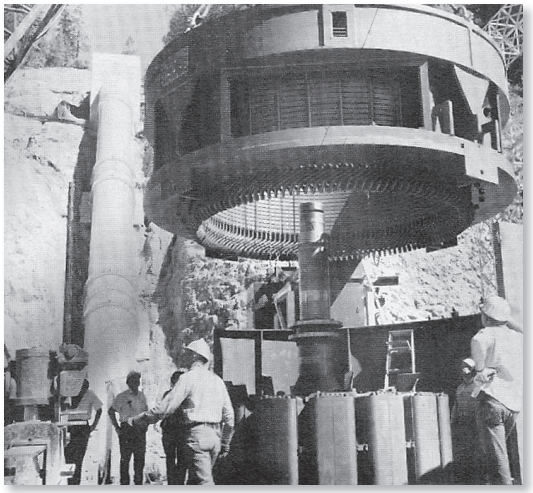
"There was no magic formula used to develop the Yuba-Bear River Project. The general ingredients consist of many years of study, planned engineering, clearing hurdles, and exercising faith and perseverance, which are the prelude to such developments as the Yuba-Bear River Project."

Koster left NID in 1968, moving from Penn Valley to Weimar in Placer County. He went on to serve for another 15 years on the Placer County Board

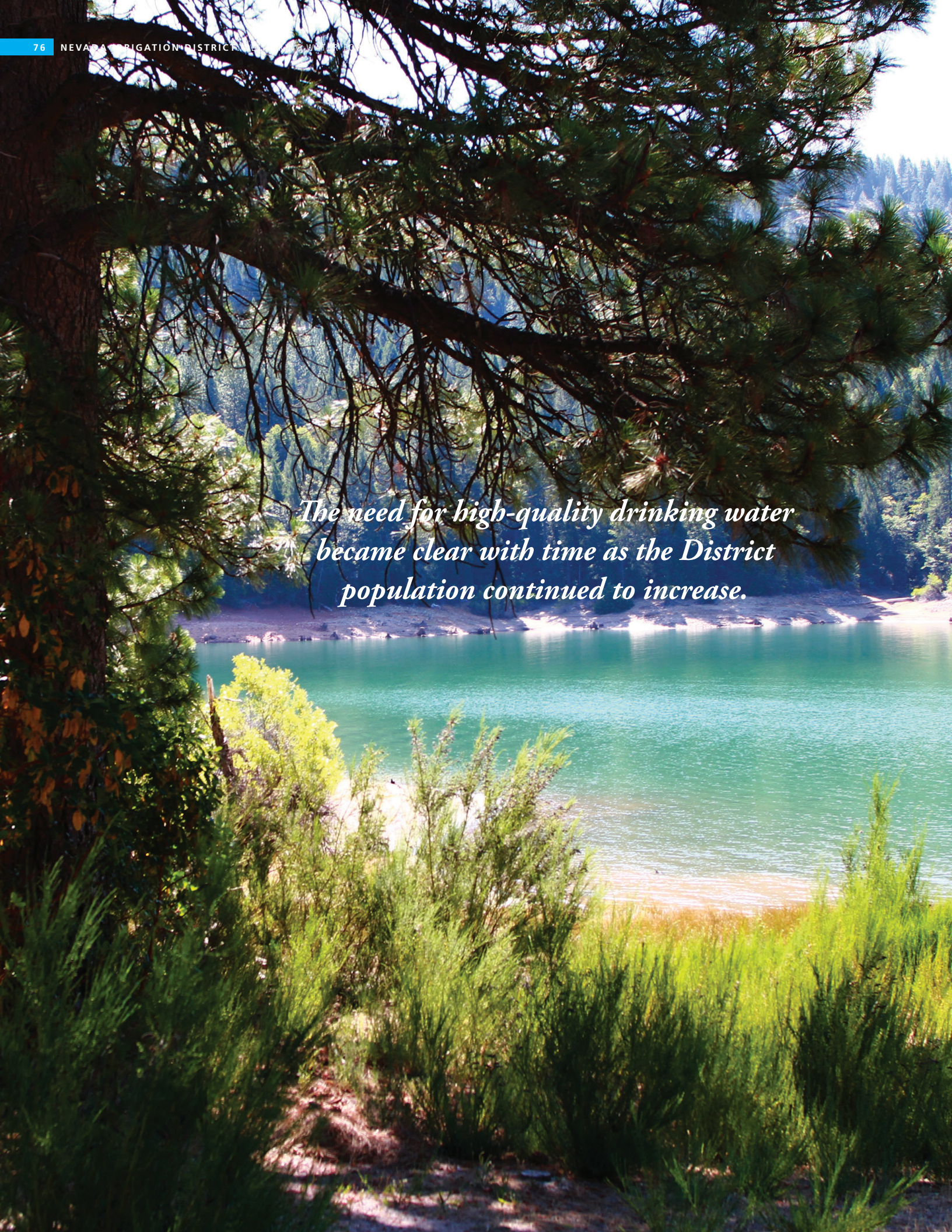


of Supervisors' Water Advisory Board and Placer County Water Agency Board of Directors. In all, Koster spent more than 40 years in water and power development. On a side note, he also was a noted ballroom dancer who enjoyed dancing well into his retirement years. He died in 1995 at age 90 at his Weimar home.

Succeeding him as general manager was Frank Clendenen, who served in the top post from May 1968 to July 1971. Clendenen first appeared before the District's Board of Directors in 1966, representing James M. Montgomery Consulting Engineers of Lafayette to discuss a status report summarizing the District's accomplishments and financial structure. He served as a consultant until appointed General Manager on April 24, 1968 with a unanimous vote by Directors. His salary was $1,350 per month. ■



Dutch Flat No. 2 Powerhouse



The need for high-quality drinking water became clear with time as the District population continued to increase.

CHAPTER 11

Water Quality Comes of Age: 1970s

Community Growth and Drought are Challenges

Loma Rica treatment plant

A popular expression was that NID was short for "Not Intended to Drink," and it wasn't. From the beginning, the raw water delivered via ditches to farms and fields was intended for irrigation. However, well before the 1970s dawned, the conversation had begun with state public health officials about water quality for domestic use. Discussions with the state can be traced to 1952, when homeowners connected their properties to irrigation ditches and were using untreated ditch water for household use, including as drinking water. State regulators were concerned about public health and needs for filtration and chlorination. Initially, in 1957 and 1958, NID placed chlorinators on domestic supply stations along the ditch systems. At one point, the District operated 19 chlorination stations, which provided disinfection to water supplied to about 2,000 people in a 75-square-mile area.

Yet, the need for high-quality drinking water became clear with time as the District population continued to increase. By the early 1960s, NID had 3,490 domestic customers and 1,238 raw water customers. When, in 1966, the state issued a mandate requiring a Treated Water Master Plan as well as plans for financing the work, the District was prepared to respond.

Definitions of water treatment

The Centers for Disease Control and Prevention (CDC) reports that drinking water sources are subject to contamination and require appropriate treatment to remove disease-causing agents. Public drinking water systems use various methods of water treatment to provide safe drinking water for their communities. Common steps in modern water treatment include:

Coagulation and Flocculation

Often the first steps in water treatment, chemicals with a positive charge are added to the water. The positive charge of these chemicals neutralizes the negative charge of dirt and other dissolved particles in the water. When this occurs, the particles bind with the chemicals and form larger particles, called floc.

Sedimentation

Floc settles to the bottom of the water supply, due to its weight. This settling process is called sedimentation.

Filtration

Once the floc has settled to the bottom of the water supply, the clear water on top will pass through filters of varying compositions (sand, gravel, and charcoal) and pore sizes in order to remove dissolved particles, such as dust, parasites, bacteria, viruses and chemicals.

Disinfection

After the water has been filtered, a disinfectant (for example, chlorine, chloramine) may be added in order to kill any remaining parasites, bacteria and viruses, and to protect the water from germs when it is piped to homes and businesses.

Beyond the District boundaries, water quality for drinking water was a chief concern of federal and state legislators. On the federal side, Congress amended the Federal Water Pollution Control Act, initially passed in 1948, to establish the 1972 Clean Water Act (CWA), which set perimeters to provide safe drinking water for all Americans. On the state front water quality came to the forefront, ultimately leading to the passage of California's Porter-Cologne Water Quality Control Act in 1969 to regulate the quality of drinking water.

While water treatment methods can be traced to ancient Greek and Sanskrit writings, the concept has remained unchanged through the centuries – to use processes to filter and purify water to reach a safe level for drinking. Early water treatment methods included filtration through charcoal, exposure to sunlight, as well as boiling and straining water. Visible cloudiness (later termed "turbidity") was the driving force behind the earliest water treatments, as many sources of water contained particles that had an objectionable taste and appearance.

By the 1970s, the worry over aesthetic problems and pathogens evolved to concerns about industrial and agricultural advances that had created new man-made chemicals, which were leaching into water supplies. A study by the U.S. Public Health Service in 1969 found that only 60 percent of surveyed water systems provided drinking water that met federal guidelines. Modern water treatment, in general, relies on several key processes: dilution, coagulation and flocculation, settling, filtration, disinfection and other chemical processes.

The quality of the water source and the effectiveness of source-water protection and management have a direct bearing on the treatment that is required. NID's water source is pure Sierra snowmelt tapped at the source in higher montane elevations, which ensures a quality start to the supply flow. With the addition of modern water treatment plants, NID could guarantee domestic customers high-quality, safe drinking water.

The legislative protections were vital for public health, but they also established expensive regulations by which NID needed to abide. Throughout the 1970s the District invested $8 million to expand treated water service.

While NID continued to refine its treated water system, the District also remained true to its origins. On the local front, the debate over irrigation water versus treated water continued. When longtime agricultural water users questioned the

widening focus on domestic water service, their protests were heeded by the District, and the Directors invested millions of dollars in its raw water delivery system. For example, much effort was put into upgrading the Cascade Canal, built by William Harrison Folsom and put into use in 1860 with 53 cubic-feet per second water flow. The District installed steel framework to hold the side forms used to place concrete walls. The frame was 60 feet long, and was on wheels so crews could advance it after pour and stripling work.

NID's first modern water treatment plant was built on Banner Mountain near Nevada City. Funding for the $1.3 million plant was spearheaded by local business leader Elizabeth L. "Betty" George, who was serving as president of the Sierra Economic Development District (SEDD). The original water treatment plant, named in her honor, was dedicated on May 27, 1970. When it began operation, it supplied 2,200 customers.

During the Banner Mountain plant dedication, NID General Manager Clendenen noted, "It was natural to name the plant after her; she did so much," He described George as "a dedicated and capable person with a strong desire to serve her community."

"She was very caring about the community," said longtime friend Vera Koehler of Grass Valley. "She had great organizational skills. She got people to work together."

NID Board Secretary Dorothy Miller recalled, "Do your homework – that was one of her favorite sayings. She didn't have much patience for people who weren't prepared."

Grass Valley Planning Director Bill Roberts put it more bluntly: "She had a great ability to put the fear of God in everybody."

At the same time as the Elizabeth George Water Treatment Plant was coming online, NID was building a second plant off Locksley Lane in North Auburn. George was integral in securing a $1.3 million grant, obtained through SEDD, to construct the North Auburn Water Treatment Plant.

Elizabeth George was a champion of clean water

Elizabeth George was a community leader credited with bringing millions of dollars in economic development funds into the region in the late 1960s and early 1970s.

After attending college, George returned to Grass Valley and became interested in economic development. Aware of the area's potential for growth, she recognized the need for advanced planning of water and sewer systems.

In 1966, she was appointed to the Nevada County Overall Economic Development Program Committee, a citizen advisory group.

"She became very much involved in that process," recalled Bill Roberts, who was the Nevada County planning director at the time. Roberts said George took the lead in making application and lobbying the federal Economic Development Administration (EDA) in Seattle and Washington, D.C. to gain funding for seven Nevada County projects, including sewer systems for Glenbrook Basin, Hills Flat, Truckee and Donner Summit; sewer improvements in Grass Valley; and water improvements for Donner Summit and NID.

Her accomplishments caused regional EDA officials to ask her to establish a local economic development district, which later became a model for other districts in the state. The Sierra Economic Development District (SEDD) was formed in 1969 and continues to serve Sierra, Nevada, Placer and El Dorado counties. She served as the organization's first president until 1971, and then took over as the group's executive director until 1973, when she passed away.

Albert Scurr

NID was in lockstep with what was occurring nationwide. In 1974, President Gerald Ford signed into law the Safe Drinking Water Act, the first piece of legislation of its kind to provide a comprehensive regulatory framework for overseeing the nation's drinking water supply. The law was the key in setting standards to ensure safe drinking water to all.

Throughout the decade, the number of NID treatment plants built kept up with the demand of the number of domestic customers. The Snow Mountain Water Treatment Plant, east of Nevada City, was built in 1973; and the Loma Rica Water Treatment Plant, near the Nevada County Air Park, followed in 1974. By 1980 NID was operating 15 water treatment plants of various sizes to serve its growing and scattered domestic service areas. Later, operations were consolidated to five modern treatment plants (and a small satellite plant at Smartsville), with several interties that provide backup supplies in case of emergency or operational needs.

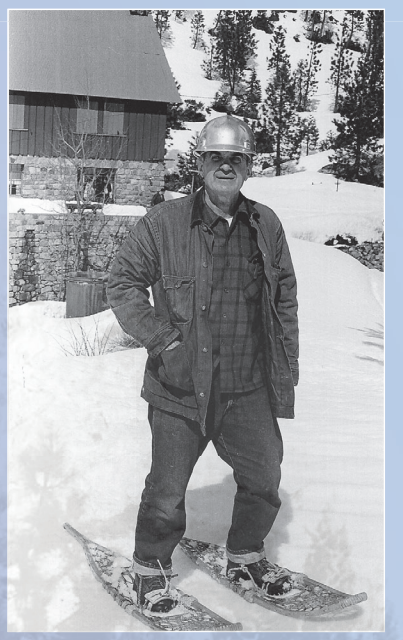
By 1975, NID's customer base had grown to 8,973, and 135 employees worked in the field and in its offices. Throughout the push for quality treated water, employees maintained their focus on their duties to provide water to customers and run an efficient water district.

Change in NID management

While the focus remained on delivering high quality water, there was a shift in NID management early in 1971 when General Manager Clendenen's contract was not renewed, and Albert W. Scurr, the District's Administrative Assistant, took over the head duties until 1977. The likeable and energetic Scurr joined NID in 1946 after serving in the U.S. Army during World War II. During his 31-year career at the District, he rose through the ranks from a laborer to the top management position. His positions included laborer, a surveyor

NID routinely tests water quality at its water treatment plant laboratories.

Frank "Showshoe Fritz" Plautz was a true mountain man



One dedicated, and colorful, employee who helped keep the water flowing from the Sierra source was Frank "Showshoe Fritz" Plautz, a true mountain man. For 22 years, from 1960 to 1982, he and his wife, Ramona, lived at remote Bowman Reservoir, where Fritz worked as NID's lake tender.

On the Sierra's western slope, at the 5,600-foot elevation, summers are pleasant, but in winter the tiny road to Bowman disappears under a wall of snow. It was 15 miles to the nearest plowed road, and each year the couple planned to be snowbound for six to seven months.

Snowshoe Fritz earned his nickname because he shunned the use of snowmobiles or even skis and instead used snowshoes to make his daily rounds, where he charted lake levels, adjusted water releases and operated a small weather station. He used four models of snowshoes, depending on snow conditions.

In a 1979 story in The Sacramento Bee, Fritz said each winter brought new challenges, but that he and Ramona had been snowed in as early as November 9 and as late as June 7.

At the time, their only contact with the outside world was the weekly helicopter flight that arrived with mail, newspapers and fresh vegetables. Firewood and most food and supplies were stockpiled prior to winter. Before cell phones, satellite television, Internet and Skype, Fritz had land line telephone service – when the lines didn't go down in snowstorms -- and a shortwave radio. A small hydroelectric generator at the base of Bowman Dam provided electricity and a small antenna picked up Sacramento television stations.

As might be expected, Fritz was a self-styled weather expert. In The Sacramento Bee newspaper story, he recalled December 1964 when in one month he measured 45 inches of precipitation -- the equivalent of 37 feet of snow -- at the stone and wood cabin that he and Ramona called home. In the winter of 1969, they had to climb in and out of the house through a third-story window.

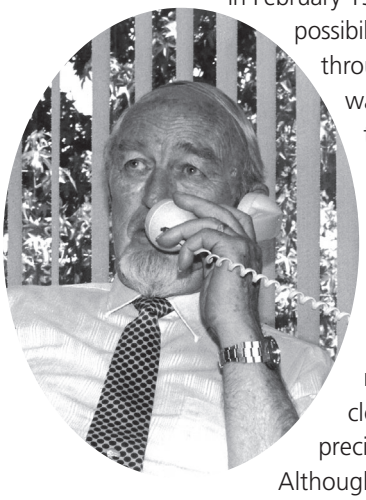
in the Engineering Department, and later as the right-of-way agent for the Yuba-Bear Power Project.

Scurr led a number of projects with expertise. For example, the Cascade Canal extension was a multiphased project, with the last contract awarded in April 1973 to construct about 11,300 feet of pipeline varying from 16 to 48 inches in diameter. This was the last piece to complete the upgrade of the entire Cascade system, a significant accomplishment.

The record drought of 1976-77 challenges NID operations

Perhaps one of the most serious challenges in NID history was the unprecedented two-year drought of 1976-77. Through the dry 1975-76 rainfall year, District water managers assumed normal precipitation conditions would return at least by the next year. But after a second abnormally dry year, the Board of Directors became concerned. The 1976–77 winter was the second driest water year on record in California, producing only 30.8 inches of precipitation at Bowman

Frederick Bandy



Reservoir, just 46 percent of average. Back-to-back dry years presented the District with serious water shortages, which led to water rationing and serious financial shortfalls. The conditions were so dire that in February 1977 the District investigated the possibility of increasing precipitation through cloud seeding. The plan was to team up with PG&E and the North American Weather Consultants for a program to cover an area of 180 square miles including the Middle Yuba and South Yuba rivers, everything above Jackson Meadows and Bowman reservoirs. A report indicated cloud seeding usually increased precipitation by 5-10 percent. Although silver iodide is more effective in seeding, the proposed program planned to use less-objectionable dry ice. The Board voted unanimously to move ahead with the cloud-seeding partnership.

The crisis continued, and in May 1977 Directors declared a drought emergency, triggering water rationing. Homeowners were required to water their lawns with only hand-held hoses; no sprinklers were allowed. In its 1977 annual budget, NID faced a $272,225 deficit because water sales had been cut by about 50 percent due to the drought. Directors needed to implement a $4 monthly drought surcharge to customers, which continued for three months. With employee support, the Board also imposed an 8 percent wage cut.

First woman elected as Director

Carole B. Friedrich of Nevada City in 1977 became the first woman to be elected to the NID Board of Directors. Friedrich, who spent six years on the Board, including service as president, also had been the first woman to serve on the Nevada City Council.

Importantly, the drought served as an eye-opener, bringing a realization that NID's water supplies were limited and entirely dependent on Sierra snowmelt. Water levels had dropped to dangerously low levels, so low the District closed Rollins Reservoir to public use.

Scurr steps down; Bandy named General Manager

In 1977, after serving more than five years as NID General Manager and guiding the District through some difficult times, Scurr stepped down. He said changing times had brought a need for a change at the District. In his letter of resignation, he noted, "A professional manager I am not, and it is my belief that from this time forward a professional manager seems to be a necessary must. ... By presenting my request at this time, it will enable the Board to take sufficient time to advertise and find a professional manager that will accomplish the long-range projections of the District. It is of utmost importance to me that the request not be construed as or interpreted as deserting the position." He emphasized, "It should be accomplished as smoothly as possible for the sake of all concerned, including of most concern, employees and the general public."

A dedicated employee and respected man, the community praised Scurr upon his departure. For example, a handwritten note from Don Wagner, an industrial psychologist, read: "I personally think you are too nice a guy to be in a job that often demands actions that you would find undesirable … be thankful that you are not burdened with drive or ego that is sometimes considered to be necessary in a Manager's job." Additionally, Nevada City Attorney Harold Berliner said, "Congratulations on all the work you have put into making things go. Even though it may not seem to be appreciated, you have the satisfaction of knowing it was done."

On September 16, 1977, Frederick G. Bandy was named general manager, beating out three other highly qualified candidates. Bandy was hired at $30,000 annually, and a new position, assistant general manager, was created, to which Scurr was appointed. Bandy brought 20 years of irrigation district experience, including working for the Bureau of Land Management in Merced and working with the Madera Irrigation District

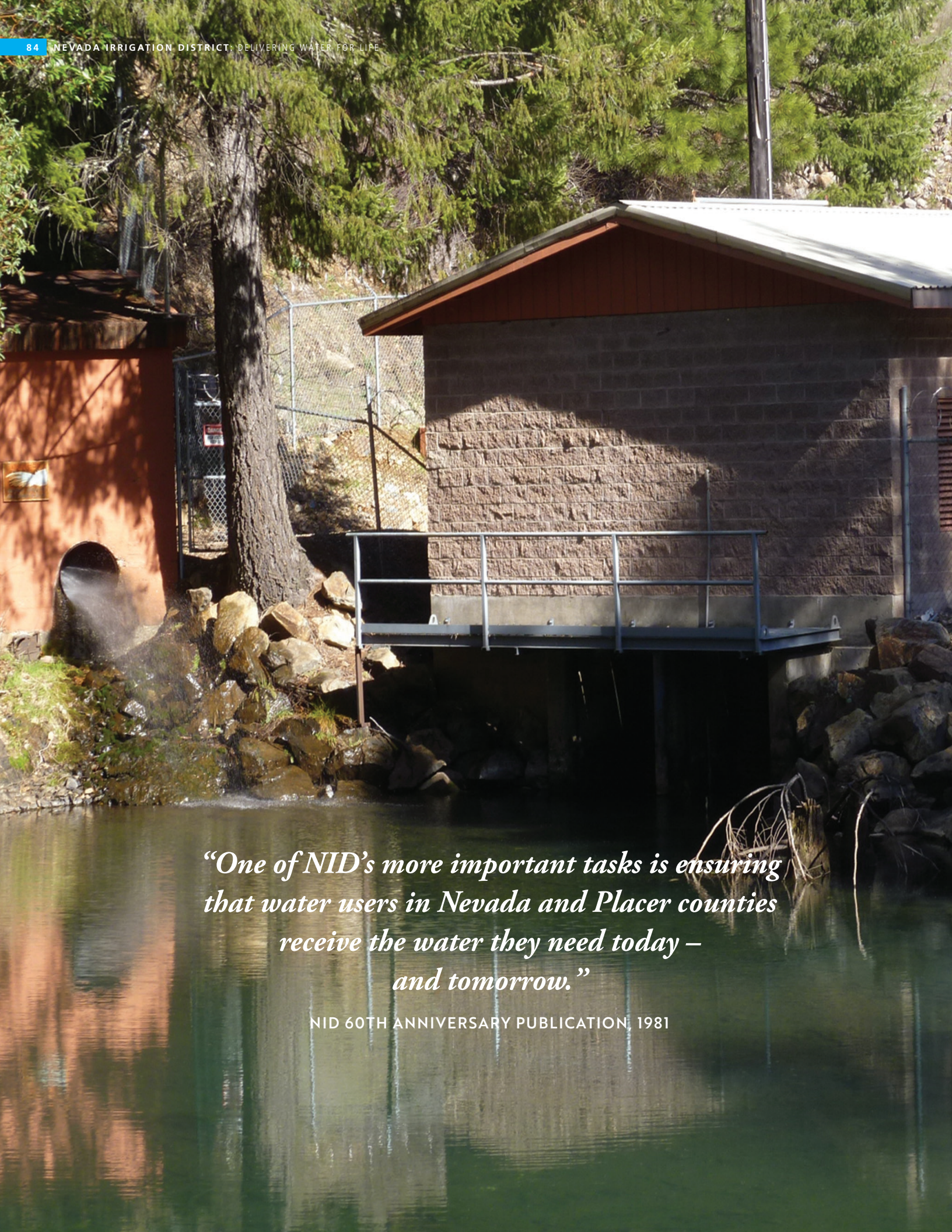
Rollins Reservoir dropped substantially in 1976 during the drought.

as a groundwater investigator and ditch tender. Bandy's focus at NID was on improving the District's financial condition and bringing major hydroelectric projects online.

He literally had the elements to battle from the onset. Working to recover from the devastating effects of the drought in 1978, NID adopted a bare-bones $5.3 million budget, which would be further slashed to $4.7 million in 1979. Customers, some of whom were angered by drought surcharges on their water bills, voiced concerns to the District. Longtime NID Legal Counsel David Minasian provided an elegantly simple vision saying, "Benefits the people within its boundaries can derive from their district will be measured by the extent to which the people within the district cooperate to make it a success."

Fortunately, Rollins Reservoir filled and spilled on January 6, 1978, and drought rules in effect for nearly a year were lifted by the Board of Directors in February. Putting its experience to use, the District began to formulate drought contingency plans, which would be put to the test in future years.

Facing new challenges in treated and raw water distribution, water quality legislation and management changes, the 1970-80 decade also brought the largest growth NID had seen, to 13,684 customers. To keep up with the changes, in 1979 the District installed its first in-house computer system; it had been contracting out for computer service since 1965. ■



"One of NID's more important tasks is ensuring that water users in Nevada and Placer counties receive the water they need today – and tomorrow."

NID 60TH ANNIVERSARY PUBLICATION, 1981

CHAPTER 12

NID Grows with the Community

The 1980s brought wide-ranging advancements, as well as challenges. A dramatic increase to the region's population forced NID to upgrade its aging infrastructure, while continuing to invest in water treatment to ensure the best drinking water quality for domestic customers. The District also put a priority on expanding hydroelectricity generation capacity with new power plants.

The state of California reported Sierra foothill counties grew by 17 percent from 1980 to 1982, a rate that made the region the fastest-growing in the state. In 1980, NID's 150 employees were serving 13,684 customers – 9,500 of those domestic – and the District was experiencing the largest 10-year growth rate ever. At the time, workers were hard-pressed to keep up with the demand. For example, only two full-time meter readers were each reading nearly 5,000 meters per month.

By 1982, 2,000 more customers were depending on NID water, and the District celebrated its 10,000th metered water customer that year. General Manager Bandy noted, "Land uses are changing and we're responding to different

Scotts Flat

needs. The demand for treated domestic water is growing much faster than demand for agricultural water."

Understanding the growth that was taking place and the added stress put on the aging water system of tiny canals and old wooden flumes, some dating to the 1800s, District leaders focused on upgrading the existing infrastructure. In fact, starting in 1980, a third of the NID workforce and 44 percent of NID's budget were devoted to system maintenance.

"Many of the problems we have are related to old structures and ditches," said Delbert Hedges, Director of Water Operations at the time. "We have bottlenecks where sections of canals have been enlarged but other portions have not." Additional hurdles included canals in difficult, inaccessible areas and on private property where landowners often opposed change.

The vulnerabilities were put on display on June 6, 1980, when a 220-foot section of the Combie Canal failed, sliding into the Bear River and cutting off water deliveries to the southern portion of the District.

The number of projects during this period was impressive. For example, in March 1981, NID replaced 2,000 feet of the Lime Kiln Siphon, one of several "Tibbetts Siphons" designed into the raw water system 60 years earlier by founding Engineer Fred Tibbetts. This and other siphons allowed the ditch system to flow by gravity through the ups and downs of rolling terrain. The following year, crews began a major two-mile upgrade of the Cascade Canal downstream of Red Dog Road where six old wooden flumes were replaced with 60-inch steel pipe.

In a special 60th Anniversary publication in 1981 by The Union newspaper, NID's past was celebrated with a notation of its primary challenges for the future: "California is rich in water resources but faces critical problems because of uneven distribution of rainfall. There is demand in Southern California for Northern California water. Two-thirds of California's water originates north of Sacramento but 70 percent of the state's water users live to the south," the publication noted. It continued: "What does this mean to the residents of the NID? To officials at NID it means the District must continually prove it is putting our valuable water supply to its highest and best use."

"One of NID's more important tasks is ensuring that water users in Nevada and Placer counties receive the water they need today – and tomorrow. Long-range planning is a major concern of NID.

"Under complex water right laws administered by the state Water Resources Control Board, NID

must respond continually to an ever-increasing number of regulations, including those governing water quality and the beneficial use of the water supply.

"NID's first water right applications date back to 1918 and 1919, even before the people formed the District in 1921. Other applications have been filed through the years, most recent in 1976 for water to operate the hydroelectric power plant at Rollins Reservoir.

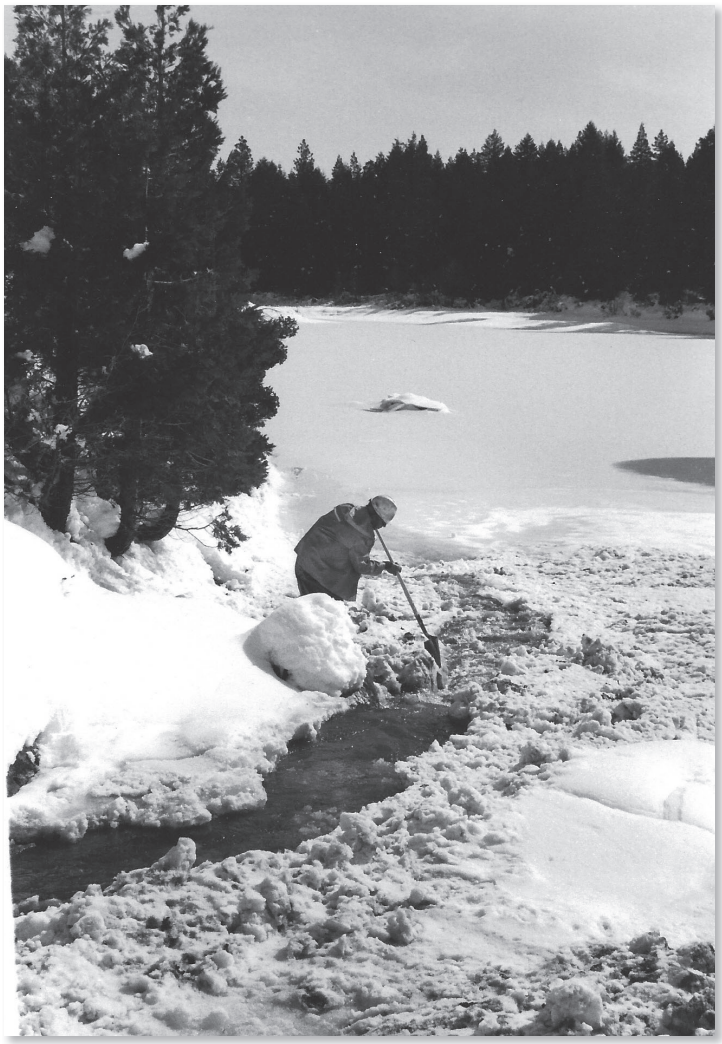
"There are four purposes for which the water right applications have been filed – mining, agriculture, domestic use and power production. Changing times have caused mining to be questioned as a valid water use but other uses such as recreation and fish and wildlife habitat have come into acceptance.

"Today, agricultural water users account for about 90 percent of the water NID supplies each year. Agricultural water users are considered important to the District in protecting its long-standing water right permits and licenses.

"Originally formed for irrigation purposes, NID in recent years has been going through a transition process, responding to increasing demand for domestic (treated) water service. Today, more than 9,500 of the District's total 13,000 customers receive piped and treated water. As downstream demand continues to increase, NID will face the continuing challenge of proving that our water supply is needed here."

Developing a plan to map out the future

In recognition of the unprecedented changes occurring, NID began work on a districtwide master plan in 1982 with the goal to calculate available water supply quantities in the future, as well as to develop ways to meet those needs. NID hired CH2M Hill, a highly reputable engineering firm that provided consulting, design, construction and operations services for corporations and governments. Alarmingly, the company completed a study that showed District reservoirs would run out of storage capacity in 20 years – around 2002 – and that new storage must be added to keep up with demand.



Loma Rica Reservoir is cleaned after a snowstorm on March 5-7, 1985.

CH2M Hill recommended two new storage options: first, constructing the Parker Reservoir, which was first identified in the 1920s on the Bear River downstream from today's Rollins Reservoir; and second, adding a reservoir at English Meadows at the headwaters of the Middle Yuba River, where a Gold Rush-era dam once existed. Later, in 1988, the District also looked into an option of raising the dam at Rollins Reservoir, which was estimated to add between 4,500 and 5,500 acre-feet of storage.

In joint efforts to support regional water distribution, NID and the Placer County Water Agency (PCWA) constructed their first intertie between water systems in 1983. Interties are interconnections between public water systems permitting exchange or delivery of water. The source water was the snowmelt in the Bowman corridor that was conveyed downstream through NID infrastructure and then transferred to PCWA to supply its

It was in 1980 that the historic 22-inch water valve from the famous Idaho Maryland Mine was first displayed at NID. It still stands on the NID campus, located in front of the modular building adjacent to the main office.

customers. The agencies would continue to collaborate to supply water to Auburn and Lincoln, building a series of interties that include a certain amount of redundancy to act as a backup system in case of failure in treated and raw water infrastructure.

Meanwhile, NID's growth continued. By 1985, the District was serving 15,814 customers; and the annual budget of $8.05 million in 1984 had increased to $10.4 million in 1986.

NID management change: James Chatigny named new General Manager

In the mid-1980s District management once again changed with General Manager Bandy's retirement. Then-Board Chairman Carole Friedrich paid tribute to Bandy, saying, "He's leaving the District in the best shape it's ever been in." Bandy retired on April 30, 1986, due to health reasons and because "It's just time."

James Chatigny, who was hired in 1979 as an administrative aide and became assistant manager in 1983, assumed the helm. Chatigny was chosen from 37 applicants for the permanent management position, and would hold the position for 16 years. Numerous improvements, changes and accomplishments are attributed to him during the 1980s. He was challenged to think quickly and work fast.

Starting when he was an administrative aide, Chatigny championed new, better ways of doing business. For example, he reviewed the status of the District's termination of Social Security coverage and the transfer to the more progressive California Public Employees' Retirement System (CalPERS) for retirement benefits. He presented the idea before the board, and the resolution was carried unanimously, to adopt the resolution.

As General Manager, Chatigny put an emphasis on public transparency and open governance, refining a committee system that allowed citizens, board members and personnel to engage in conversations about items. Board member Friedrich said she felt the committees served an invaluable service, "bringing the customers directly to the Board members." Chatigny also noted at the time the benefits of the committee system helped with increasing the understanding of District operations: "I think we have a very good image. We're communicating with people much better – we're communicating with our employees and the press."

Out in the field, one of Chatigny's early accomplishments was the replacement of underground "Techite" pipeline. NID had installed about nine miles of the reinforced plastic mortar pipeline in the 1960s and 1970s, but many sections were rupturing. Pinhole leaks would sometimes explode into violent pipeline eruptions. Along with other purchasers around the nation, NID sued the pipe manufacturer and won a cash settlement. NID's largest-yet Techite replacement took place in 1988, along three miles of Colfax Highway.

Another significant upgrade was the replacement of the D-S Canal Flume No. 1 for $1.7 million.

The project, which extended into 2013, involved the entire replacement of elevated structures, referred to as flumes, along the D-S Canal to strengthen the conveyance system to provide reliability and longevity, improve safety conditions for workers and increase capacity.

Hydroelectric generation expands

NID had been generating hydroelectric energy on the Yuba-Bear Project since 1966, but the Arab Oil Embargo of 1973-74 brought new attention to the potential for more clean, renewable energy. During the 1973 Arab-Israeli War, Arab members of the Organization of Petroleum Exporting Countries (OPEC) imposed an embargo against the United States in retaliation for the U.S. decision to resupply the Israeli military and to gain leverage in the post-war peace negotiations. The embargo gripped the nation, yet also opened opportunities for a transition away from fossil fuels to increased support of renewable energy, such as hydroelectricity.

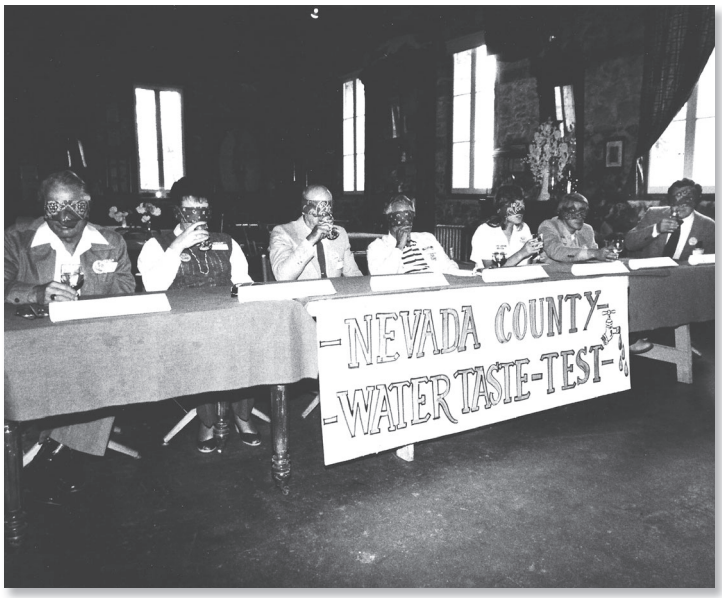
NID was poised to take advantage of this early on. Between 1980 and 1986, the District added five small hydroelectric plants to its existing water systems. The Rollins Power Plant, the largest of these, opened in 1980, followed by Combie South and Scotts Flat in 1984, Combie North in 1985 and Bowman in 1986. Each of the plants was located at the base of existing dams.

James Chatigny

As a new phase of the Yuba-Bear Project, the $8 million Rollins Power Plant was designed by the Tudor Engineering Co. of San Francisco and built under a $5.5 million construction contract with the joint venture of Nielsen-Nickles of Sacramento and the Shirley Co. of Woodland Hills. In foresight of the power plant's addition, during the mid-1970s drought, when water levels were extremely low, NID blasted a 9-foot-diameter hole into a tunnel plug at the base of the dam. Later during construction, water was diverted by a cofferdam, and an enclosure was built within the reservoir to allow the water in the restricted area to be pumped out. Good timing on the project allowed the District to save money by installing a refurbished generator in the new plant. The generator had been used at Melones Reservoir along the Stanislaus River near Jamestown since 1927 and was replaced as the New Melones Dam was opened in 1979.

Rollins Powerhouse

The first Nevada County Drinking Water Taste Test, held May 7, 1985.



The second Drinking Water Taste Test took place in May 1990.

Rollins was reported to be one of the first plants in the nation to be added to an existing dam following the Arab Oil Embargo. When it began generating hydroelectricity in 1980, it could provide enough energy to power 7,000 homes and save the burning of 90,000 barrels of oil per year.

The plant was named in honor of Al Scurr (1925-1978) who rose from laborer to District general manager during his 32-year career. On the District's 60th anniversary on August 15, 1981, NID hosted a dedication of the Albert W. Scurr Memorial Rollins Power Plant. A large number of community, industry and political leaders attended the ceremony.

NID joins forces with cities and county to bolster hydroelectric

As a leader in renewable energy in the state, NID continued to capitalize on the infrastructure and configuration of water supplies in the Sierra. In 1983, the District, Nevada County and Nevada City formed the Nevada Power Authority (NPA), a cooperative alliance that allowed the agencies to issue revenue bonds for new hydroelectric power plants. The NPA was formed after 74.3 percent of voters supported adding hydroelectric energy production. NID's Bowman Power Plant was the first plant built following the formation. Plans were already underway for new hydroelectric plants at Scotts Flat and Combie reservoirs.

In November 1989, the NID Board of Directors approved a significant reorganization of the District, placing the Placer County-based hydroelectric division under the direct management of the general manager.

Water quality guaranteed with new modern treatment plants

Drinking water requires extensive treatment to meet health standards and ensure it is contaminant-free. By 1980, the District operated 15 water treatment plants, though many of these did not have state-of-the art facilities. They were small, remote and expensive to operate and maintain. As a result, NID's treated-water customers were provided with different levels of water treatment, depending on location. While the District addressed the growing population in the region and increasing number of domestic

customers, the focus was on upgrading and consolidating service to larger, modern plants. The cost of treating drinking water was expensive but necessary to provide the community with the safest, best-tasting water possible.

As a backdrop, the federal Safe Water Drinking Act, passed in 1974 and reauthorized in 1986, set national standards for drinking water to protect against health effects from exposure to naturally occurring and man-made contaminants. Thanks to the public health standards established by the Act, nearly every water utility in the United States adopted the same types of water treatment.

Early in the decade, NID operated full four-phase treatment on the North Auburn, Snow Mountain, Lake of the Pines and Lake Wildwood systems. Three-phase treatment was being used in the Elizabeth George and Loma Rica water treatment plants in Grass Valley. At the time, the District also operated five small, direct filtration plants, with treatment by coagulation and filtration at Kenwood, Smartsville, Sherwood, Cascade Shores and Penn Valley. Three plants – Green, Phoenix and Willaura Acres – depended on only chlorination. In time, all were connected to larger, more modern systems, with the exception of Smartsville, which is located outside the District and many miles from any other facilities.

For example, the capacity of the Loma Rica Water Treatment Plant near the Nevada County Air Park was expanded from 3.2 million to 8 million gallons per day. In addition, a new 750,000-gallon tank and 4,900 feet of main lines were added to the Lake of the Pines water system to serve the new Bear River High School. The water project was completed in 1985, and the high school opened the next year.

The expansions allowed smaller systems to tie into the larger primary ones. On November 27, 1986 a preliminary review and initial report were presented for the Willaura Acres System Improvement Project. The project tied the Willaura Acres Water System into the larger Loma Rica Water System by a 5,600-foot-long, 8-inch diameter pipeline. Ultimately the Willaura Acres system was shut down because better quality water was made available from the Loma Rica Treatment Plant.

Upgrading water treatment pays off: NID drinking water excels in taste tests

NID leaders knew that water on the west slope of the Sierra Nevada was of fine quality, and it became even better with high-quality treatment. The District wanted to demonstrate this to the community. Thus was born the Nevada County Drinking Water Taste Test, an event that would bring together the county's water suppliers in a friendly competition.

The first Nevada County Drinking Water Taste Test, held May 7, 1985, at the American Victorian Museum in Nevada City, included water samples from NID and the cities of Grass Valley and Nevada City. A panel of student and community leaders judged the water samples for taste and clarity. Jim Kerr of KNCO Radio emceed the event, and Alan Haley of the Nevada City Winery provided tasting tips. It was a very close contest with NID taking first place.

Five years later, in May 1990, the event celebrated California Water Awareness Month. It attracted five water suppliers. The smallest water supplier – Deer Creek Park Association, a homeowner water group of 211 customers – took first-place honors. Grass Valley Group, supplier of the company's campus on Bitney Springs Road, took second, and the city of Grass Valley placed third. NID and Nevada City received honorable mention. KNCO's Jim Kerr again emceed the event with tasting tips offered by Tony Norskog of Nevada County Wine Guild.

The third Nevada County Drinking Water Taste Test, held in 1994, celebrated National Drinking Water Week. It was held at the Holbrooke Hotel in Grass Valley and featured six water suppliers, with the tiny Washington County Water District joining the group. NID placed first, Grass Valley was second, and Grass Valley Group placed third. Student, business and community judges sipped water, judging the samples for taste, clarity and aroma. NID specialists tested all the samples, reporting that all exceeded state public health standards, with three testing clearer than bottled water.

NID's General Manager Chatigny said the event had been very successful in raising local water awareness: "There are no losers, only winners in this contest. The people of Nevada County should be proud of their water suppliers and know that this area enjoys some of the finest water in the nation."

Further separation of raw and treated water

Since 1972, customers could apply for raw water domestic service. In their requests, applicants needed to prove a hardship, such as failed wells, to apply for these connections. By the early 1980s the District estimated about 1,000 NID customers were using raw water as a domestic source. Some implemented small home water treatment systems to help with purification. Public health officials frowned upon that practice, and put the pressure on NID to resolve the situation as a matter of community health.

A long process began to phase out domestic service for in-home use. NID Directors adopted a policy in 1985 to stop accepting service applications when the applicants noted they planned to use raw water from ditches and canals as a domestic source. And the District teamed with homeowners to form districts for water quality improvements.

In another move to protect water quality, NID addressed the need for backflow prevention to prevent the reverse flow of water in the piped, treated water system. Backpressure occurs when the customer water pressure becomes greater than the District water pressure. Problems may occur when homeowners don't properly install or maintain an adequate backflow device. The increase in the use of backflow preventer valves helped keep water from flowing back into the public water supply. In addition, an encroachment permit program was instituted to prevent construction in close proximity to water conveyance facilities and protect the public water supply.

In 1987, NID was ordered by the state to begin planning water quality improvements for areas where untreated water from open canals was believed to be used in homes.

Water rates increase is a painful reality

The amount of work to modernize NID's systems was not cheap, and Directors needed to tackle the necessity to raise rates to customers. An independent cost of service study in 1980 showed that NID domestic and commercial ratepayers were paying rates close to the District's costs of providing service, but agricultural and raw water uses were paying below cost. Board President Carole Friedrich promised to seek rate balance while preserving affordability for raw water customers.

Trying to cover the cost of service, in January 1981 NID Directors approved a 14.3 percent water rate increase, which was equal to the increase in the Consumer Price Index (CPI). Saying the increase still lagged behind growing costs of operation, Directors increased connection fees to the treated water system by 20 percent to $1,460 for a standard 5/8-inch connection that provided a flow of 20 gallons per minute. The next year rate increases were pegged to the CPI for the fifth year, amounting to an average of 10 percent.

As NID's annual budget reached $8 million in 1984 and the focus remained on improving the treated water system, water rates continued upward at 5.9 percent for domestic users and an average 8.2 percent for raw agricultural water users.

The 1986 NID budget was approved at $10.4 million, and the NID Board continued its practice of adjusting rates to keep up with the increasing costs of doing business. Water rates increased 2 percent in 1987. In 1989, rates for treated water users were increased by an average 3.6 percent while raw water rates went up 4.9 percent.

Facing the realities of the cost of water, NID customers were on a learning curve about the importance of water efficiency practices. It was a time, following the 1970s drought, when water conservation practices were being adopted by water agencies across California. Citizens were beginning to learn that water supplies were limited and needed to be put to their highest and best uses.

Does the Drum Canal at Highway 20 flow uphill?

A bit of a curiosity turned into the talk of the town in the mid-1980s. The discussion centered on the Drum Canal at Highway 20. Was the water flowing uphill?

Traveling up Highway 20 toward Lake Tahoe, people were noticing PG&E's Drum Canal above Bear Valley, where the water appears to be flowing uphill. The canal, which also carried NID water, was often mentioned to PG&E and NID employees. People asked, "How does that water flow uphill?"

The answer is: It doesn't. It just looks that way. To prove the point, Chuck Lauer, NID's lake tender at nearby Fuller Lake, agreed to take his level over to the canal and settle the issue once and for all. His measurement in the mid-1980s showed the canal walls to be level and the water in the canal appeared by comparison to be flowing slightly downhill.

"It's an optical illusion," said Gary Kalsbeek, a former manager of NID's Hydroelectric Division. "When you look at it, the frame of reference for what is level is out of whack."

Kalsbeek said water will run uphill if it is being pumped but that free-flowing water would spill over the sides of the canal before it would climb a hill. The "uphill" canal carries water from Lake Spaulding through several PG&E and NID power plants to Rollins Lake.

When not planning for drought, NID Directors were pressed to deal with near record-breaking rain and snow. The early 1980s brought some of the wettest conditions the District had ever experienced, just a few years after the record-setting drought during the 1970s. In the 1981-82 rainfall season (July 1-June 30), Bowman Reservoir received 127.42 inches of precipitation, 189 percent of average, including 389 inches of snow. It was the wettest year of the century. The following 1982-83 rainfall season brought 103 inches of precipitation, including 334 inches of snow.

One of the biggest snowstorms in recent decades moved over the Sierra foothills March 5-7, 1985, dumping 2-3 feet of snow in areas around Grass Valley and Nevada City. Canals were blocked by snow and ice with overflows reported on smaller ditches. NID crews worked around the clock to keep the water flowing. Maintenance employees broke through ice and snow to keep water flowing into the snowbound Loma Rica Reservoir.

The next year, a series of rainstorms in February 1986 created water flows never before seen in the NID system. District damages were estimated at $1.7 million, and it would be a year before debris and residue would finally be removed from the system. Runoff from the chalk bluffs at Scotts Flat Reservoir created cloudy conditions in the lake but cleared later in the year.

Then the weather took a drastic turn. By February 1987 the region was experiencing a 26-day drought – only a trace amount of rain had fallen compared to about 7.5 inches the year before. Operations Manager Del Hedges took matters

During the harsh winters and hot, dry summers, NID water managers still met all needs, including providing flows for fish.

into his own hands to try to elicit rain. Early one morning, he put on his best rain-dancing shoes and ventured to the parking lot in an attempt to coax moisture out of an otherwise clear sky. The act didn't work.

The roller-coaster continued. A few years later, a frigid snowstorm opened 1989. In February, the so-called Alaskan Express brought major ice buildups in the upper elevation canal systems. NID maintenance crews had to manually float ice down through the canals to prevent blockages. For customers, there were numerous frozen and broken pipes on homes in Cascade Shores, east of Nevada City. Many of the dwellings were owned by absentee homeowners, and leaks in those homes went undiscovered, draining the local water system. It took three days to locate and repair the leaks.

Even after the big storm, it appeared 1989 would be a drier than average year, the third in a row. That was until the spring of 1989 produced a "March Miracle" and a dramatic turnaround. Within 10 days, 30,000 acre-feet of water flowed into NID reservoirs, with seasonal precipitation jumping to 91 percent of average. By June 1, annual precipitation had risen to 68.28 inches, or 103 percent of average for the date.

Throughout the extreme weather conditions, NID water managers needed to adjust levels to meet different water needs throughout the year. The severe storms in the winter meant the reservoirs needed to keeps gates open to allow water to flow through and not back up the systems. And while late spring snowmelt helped to fill the reservoirs, water demand was always highest during the dry months of summer. Stored water needed to be released to irrigate crops, provide drinking water, generate hydroelectric power and support ecosystems with environmental flows in the rivers. The drought-to-deluge pattern constantly kept the water managers on their toes, with daily monitoring and decision-making in order to keep the water flowing to customers.

The 49er Fire burned 33,700 acres.

New NID campus additions

NID had arrived as a modern water supplier with many offices throughout its boundaries. The hub was an 18-acre campus located on West Main Street in Grass Valley. In 1982, the District completed construction of a new purchasing and warehouse building, and then began to expand the main office with a second-story addition. The business center was located in the main building with easy access and ample parking for customers.

Besides improving how the public could interact with the District, strides were being made to modernize technology in the field. It took some time, but by 1987 NID had introduced electronic meter reading. Three meter readers used hand-held computers to read 12,000 meters, with each meter reader averaging 350 meters per day.

Nature wouldn't be outdone – the destructive 49er Fire

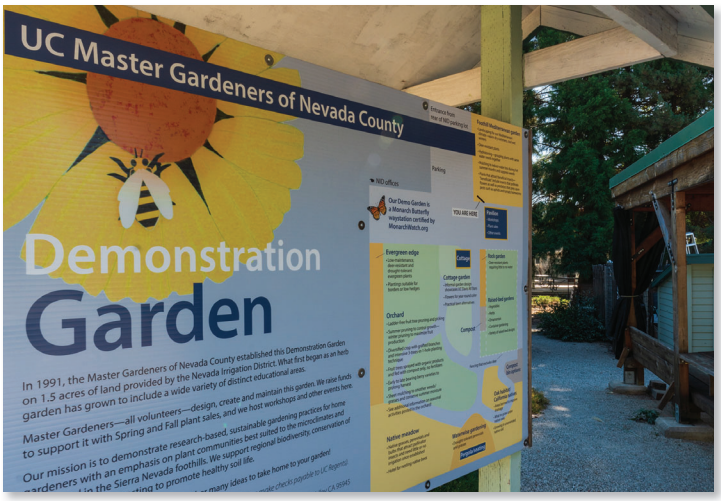
The 49er Fire, perhaps the most devastating fire in Nevada County history, raged from North San Juan to Penn Valley in September 1988, burning tens of thousands of acres and destroying hundreds of structures. The fire started in the morning of September 11 when a homeless man set toilet paper on fire off Highway 49 near North San Juan. The spark took off, and flames raced down through Lake Wildwood and Penn Valley and into Rough and Ready. The blaze threatened NID's Lake Wildwood Water Treatment Plant, but spared the plant. Firefighters brought the fire under control September 16. During the blaze, NID crews scrambled to keep the District's water systems intact. Water service was interrupted, but restored in one day. Ultimately, the fire burned 33,700 acres – a total of 53 square miles – and destroyed 312 structures, 89 vehicles and 17 boats. About 4,000 residents were forced to evacuate. The 49er Fire was the third most pernicious fire in state history at the time, causing an estimated $22.7 million in damage.

Even veteran firefighters were stunned by the speed and ferocity of the blaze. "It reminded me of some war scene," said retired CDF Region Chief Bill Holmes, recalling his first view of Lake Wildwood from the air in a retrospective by The Union newspaper in 2018. "All I could see were houses burning and boats on fire floating around randomly. … Both lanes of the road leading to Lake Wildwood were full of trucks and cars full of belongings, pets and horses heading out to Highway 20. It was almost impossible to drive into Lake Wildwood." ■

Throughout this period of extreme weather fluctuations, the District acknowledged it needed to look to long-term adjustments and turned to support agricultural endeavors through better use of water.

CHAPTER 13

Thinking about Water in a Different, Better Way



By the early 1990s NID was supplying treated and raw water to nearly 19,000 customers on an annual budget of $18.6 million. Through its earliest decades, NID focused on larger water projects that would extend supplies into areas that lacked public water. The District also worked to improve and expand service to existing areas that needed more water. As the 1990s dawned, the focus had shifted to water conservation, both locally and across California. People and government agencies were adopting the ideas of better water planning and management to make supplies go further. Climate and weather changes, new regulations and a new way of looking at water issues brought on fresh ways of doing business throughout the District.

This was driven home when NID reservoir levels dropped in consecutive years of below-average precipitation. By fall 1992, following a five-year period of below-average precipitation, the carry-over storage for the following season sunk to a 20-year low. And yet, with extended periods of shortage of rain and snow, there were anomalies. For example, a record snowstorm of February 15-17, 1990, proved to be challenging for NID. About three feet of snow fell in the Nevada City-Grass Valley area, slowing commerce for several days, freezing canals, threatening water supplies and prompting the District to call for customers to cut water use by 50 percent. NID crews worked

around the clock, picking and shoveling ice from snowbound facilities. A serious problem arose in the hills above Nevada City where frozen conditions cut the flow of water to local treatment plants. A large industrial pump was placed on a sled and towed from Nevada City up Boulder Street and Red Dog Road where it was used to supply the D-S and Cascade canal systems. Employee response during the emergency was termed "a Herculean effort" by General Manager Chatigny. The Board of Directors issued a special commendation to the District's workforce.

Throughout this period of extreme weather fluctuations, the District acknowledged it needed to look to long-term adjustments and turned to support agricultural endeavors through better use of water. Nevada County crop reports from 1991 showed increasing interest in grape growing, with vineyards planted on 245 acres. Irrigated pasture continued to be the leading crop at 17,500 acres, followed by family gardens at 2,773 acres and golf courses and parks at 675 acres. NID began offering local farmers and ranchers a computerized irrigation efficiency program that charted soil and climate data for determining watering needs.

Boulder Street in Nevada City was buried in snow during the February 1990 snowstorm.

The efforts did not go unnoticed. A Nevada County grand jury study of the District brought a result that thrilled the staff and a large segment of the community. The report offered a few suggestions, and concluded that "Overall, NID appears to be a well-managed and professionally operated organization."

Climate change acknowledged

As the foothill region was experiencing extreme weather, the concept of climate change emerged with the First Assessment Report (FAR) of the Intergovernmental Panel on Climate Change (IPCC) in 1990. The report noted, "We are certain of the following: there is a natural greenhouse effect...; emissions resulting from human activities are substantially increasing the atmospheric concentrations of the greenhouse gases: CO2, methane, CFCs and nitrous oxide. These increases will enhance the greenhouse effect, resulting on average in an additional warming of the Earth's surface. The main greenhouse gas, water vapour (sic), will increase in response to global warming and further enhance it."

Among the most profound impacts of climate change have been documented:

- *Rising average temperatures*
- *Thriving populations of tree-killing pests*
- *Tree mortality from disease*
- *Intensifying wildfires*
- *Rising sea levels of about 6 centimeters per decade*

Impacts from climate change stand to limit the availability of water, dependability of water system infrastructure, and the quality and health of the local watersheds. Increasing watershed resiliency, water conservation efforts and upgrading water system infrastructure are among some of NID's best strategies to mitigate the effects of climate change in order to continue to provide dependable and sustainable water to the communities it serves.

Facing challenges with short-term weather extremes and the increasing effects of climate change, Directors took bold steps to boost the effectiveness of the District's water delivery systems, which would ultimately save money in the long term. NID allocated $9 million to fund planned construction projects. Then-Chief

Union Reservoir is located near Smartsville.

Engineer Bob Singleton called it the most funding in at least 20 years, if not a record amount.

For example, in 1991, NID drained its small Union Reservoir near Smartsville to repair the outlet valve, in place since 1942. Besides improving the infrastructure, the project led to a dramatic fish rescue. Working with the California Department of Fish and Game, District employees netted more than 1,500 pounds of live fish and loaded them into a tanker truck that took them to other nearby reservoirs. They counted 25 largemouth bass, each weighing more than 8 pounds, along with numerous bluegill, catfish and crappie. The day's biggest catch? An 11-pound black bass. The operation was seen as unique at the time and was the subject of a seven-minute video by the Nevada County Historical Society.

Another example of a large-scale improvement was the award-winning effort started in summer 1993 to renovate the 67-year-old Milton Diversion Dam. Working with PG&E, the U.S. Forest Service and California Department of Fish and Game, NID dewatered the facility and transferred fish to other nearby reservoirs. The work included a renovation of the dam, and new control gates were added before the lake was refilled and restocked. The project earned an award from the Association of State Dam Safety Officials.

In addition, the District helped the community organize to bring NID water to their homes. From 1990 to 1992, NID and local residents formed seven local improvement districts to extend treated drinking water supplies to 250 homes.

New regulations require more testing, increase in water rates

State and federal mandates were having more impact on the finances of NID and its customers. Increasing water quality regulations brought on the need for costly testing programs. In 1992, NID Directors approved a 4 percent water rate increase and then added a line item for state-mandated costs of 2.84 percent for treated water customers and 2.04 percent for raw water customers. Part of this was a new lead and copper testing program mandated in 1991 by the Environmental Protection Agency (EPA). NID had been testing for lead and copper at its treatment plant outflows for years – finding none – but the new program would require random sampling at homes around the District. The District worked through customer privacy issues and reported good customer cooperation. Once implemented, the new testing revealed no lead and copper dangers.

Focus on enhanced water treatment and maintaining the quality of drinking water

The Board of Directors adopted a new policy calling for the expansion of the District's larger water treatment plants, with extension of their service areas, and the phasing out of the smaller, outdated treatment facilities. For example, the aging Penn Valley Water Treatment Plant was closed and its service area was connected to the Lake Wildwood system. NID had already closed many of its smaller plants and was operating 10 plants throughout the District. The grandest project was a major expansion and filtration project at the E. George Water Treatment Plant, funded through a $4.1 million low-interest loan obtained through the California Safe Drinking Water Bond Act of 1986.

On the communication front, NID also began publishing water quality reports for treated water customers. Under a new state law, the District tested its water for more than 50 potential contaminants and found, as it has every year since, that NID treated drinking water met and exceeded all state public health standards. Officials said advancing treatment practices, along with the District's water source high on Sierra watersheds away from many sources of potential contamination, helped to provide superior water quality. NID's water quality reports became known as Consumer Confidence Reports and still continue to be issued each year. When the total number of customers surpassed the 20,000 mark in 1993, the District also began publishing the detailed water quality reports each year in its quarterly customer newsletter, *NID WaterWays*.

On a side note, protecting water quality became an issue with continued vandalism at the Banner-Taylor Reservoir on Banner Mountain. The lined and covered earthen reservoir stored treated drinking water from the nearby E. George Water Treatment Plant. What was once an open reservoir was lined and covered with a heavy-duty material called Hypalon, which gave it a waterbed feel and appearance. Despite security and fencing, it became an attractive nuisance. District officials worried about water quality after vandals sliced through the floating cover in 1995. Repairs were made, security was increased and the District would eventually go on the replace the reservoir with two large water storage tanks.

By 1996, over a 10-year period, NID had obtained $10.8 million in funding through the California Safe Drinking Water Bond Act, advancing the formation of 15 water quality improvement districts and better water supplies for 579 parcels.

NID teams up with the community – Master Gardeners create a demonstration garden

In efforts to partner with community groups, NID reached out to provide land on its main campus in Grass Valley for a demonstration garden to be overseen by the Nevada County Master Gardeners. The garden would be a showcase where the public would learn more about gardening, irrigation and conservation. In March 1991 the District and the University of California signed an agreement to establish the garden. NID installed water lines and electricity for irrigation timers, while the Master Gardeners designed and planted an herb garden that fall. Vegetable beds and fruit trees were added the following year. The guiding principles were to support regional biodiversity, conserve resources and minimize pollution and waste with a focus on climate and soil-adapted plants for the Sierra foothills.

NID hydroelectric generation celebrates a milestone

NID celebrated its 25th anniversary of the Yuba-Bear Hydroelectric Project in 1990. The District used the occasion to reflect on the project's history and success, as well as to promote the value of water and power to the region. To acquaint customers with the benefits and attractions of Scotts Flat and Rollins facilities, NID published a free coupon in its customer newsletter NID WaterWays offering a free admission to customers and their guests. The commemoration included some history on Scotts Flat and Rollins reservoirs. Scotts Flat, according to local legend, took its name from a group of Scottish miners who settled there in the 1850s and 1860s. NID purchased land holdings there in 1925 from Excelsior Water and Power Company. The reservoir at Scotts Flat was originally built in

1947 and was nearly doubled in size from 26,500 to 48,547 acre-feet in the 1960s. Rollins Reservoir was built from the ground up as part of the Yuba-Bear Project in 1963 to 1965. Today, it holds 66,500 acre-feet of water. Rollins was named after the late J.L. Rollins, manager of the Bear River Water and Power Co., another private firm whose holdings became part of NID during the District's early years.

Recreation expands activities and establishes rules

At Scotts Flat and Rollins reservoirs newly built campgrounds, day-use areas and boat launches were drawing thousands of outdoor enthusiasts each summer.

NID teamed up with the California Department of Fish and Wildlife for seasonal plants of fish to support recreational fishing. The catch at both reservoirs included German brown trout, Massachusetts brown trout, rainbow trout, kokanee, largemouth bass, smallmouth bass, spotted bass, bullhead catfish and channel catfish.

In 1992, James Hughes of Grass Valley reeled in what is believed to be the largest fish ever caught at Scotts Flat Reservoir. His 31-inch, 13.5-pound German brown trout eclipsed the record held since 1980 by Bob Atkins, also of Grass Valley, who hooked a 31-inch, 11.5-pound German brown.

To emphasize and prioritize fishing and other boating activities, NID worked with the Nevada County Board of Supervisors in 1990 to ban personal watercraft at Scotts Flat Reservoir after hearing complaints about noise and speeding. The ban remains in effect today.

Environmental issues emerge in the 1990s

A campaign mounted in the early 1990s to include 13 miles of the South Yuba River in the state's Wild and Scenic Rivers program. The designation was introduced by the South Yuba River Citizens League (SYRCL), which opposed any development of dams and hydroelectric power development on the river. The Wild and Scenic proposal was a 20-mile-long stretch of river from Lang Crossing to its confluence with

NID headquarters

Kentucky Creek below Bridgeport. According to state law, the designation would prohibit construction of dams or diversion facilities. As background, California's Legislature passed the Wild and Scenic Rivers Act in 1972, following the passage of the federal Wild and Scenic Rivers Act by Congress in 1968. Under the state law, "Certain rivers which possess extraordinary scenic, recreational, fishery, or wildlife values shall be preserved in their free-flowing state, together with their immediate environments, for the benefit and enjoyment of the people of the state."

When SYRCL began advocating for the state designation, NID Directors were pressed to take a stand. On April 14, 1993, the Board went on record in opposition. The vote followed a lengthy community involvement, and although NID was not using water from the South Yuba River, Directors expressed concern that the designation could impact future water supply needs. When the state accepted the designation in 1999, the District eased its opposition.

Headquarters expanded to accommodate growth. By 1998, the number of employees had increased to keep up with the demands of keeping the water flowing to homes, farms and fields, and Directors acknowledged the need to expand the District's headquarters. The main building – housing administrative, operations, engineering and customer service functions – was remodeled with a two-story, 7,200-square-foot expansion of the east end of the building at a cost of $900,000. The NID budget was $29.2 million at the time.

Bottled water reboot

NID made a brief entry into the bottled drinking water world in 1998. In a public outreach effort to promote the District's water quality, local water supplies were shipped to a Modesto plant where they were bottled and labeled with NID's logo and information. The bottled water was handed out at the county fair, community events and elsewhere for five years. The effort was suspended over growing concerns about plastic waste in the environment. In more recent years, NID distributed reusable drinking bottles.

Discussion about the Bay-Delta water supply and the control of headwaters becomes heated

NID remained active in issues surrounding the San Francisco Bay and Sacramento-San Joaquin Delta. Beginning in 1994 under the CALFED Bay-Delta Program, also known as CALFED, state and federal planners were looking for additional water supplies for the Delta, which forms at the western edge of the Central Valley by the confluence of the Sacramento and San Joaquin rivers. The Delta is vital to California as the largest freshwater tidal estuary of its kind on the West Coast of the Americas that provides important habitat for fish and birds on the Pacific Flyway. It's also the hub of California's two largest surface water delivery projects: the State Water Project and the federal Central Valley Project. The projects provide drinking water for 29 million Californians and irrigation water for large portions of the state's $50 billion agricultural industry.

NID and many other upstream water agencies had a keen interest in the program in order to protect their water supplies, the headwaters of the Sierra. Even today, the solution to protect the Delta and secure a reliable water supply for customers in the southern portion of the state remains unresolved.

Service expansion is explored

In 1998, NID began studies of treated water service to the growing Lincoln area in Placer County. Also, by the end of the decade, 10 golf courses were among NID's agricultural water users: the Orchard and Hills courses at Del Webb Lincoln Hills, Darkhorse, Nevada County Country Club, Alta Sierra, Quail Valley (now closed), Lake Wildwood, Lake of the Pines, Auburn Valley and Turkey Creek.

NID Trails – public vs. private use debated

The debate over public versus private use of the berms along NID canals emerged as a contentious community issue in Nevada County during the mid-1990s. More members of the public had discovered the canal system as an outdoor treasure of walking and jogging trails. The canals and ditches, NID's primary waterways that were the distribution system from higher up in the Sierra, had berms and semblances of trails so NID personnel could access any point to maintain. Most of the "trails" were legal easements on private property that included the ditches and canals. An attractive destination for walks and treks, the pathways along the waterways had become a public attraction through the decades. However, landowners along the canals faced loss of privacy and worried about trespassing, littering and safety.

NID was caught in the middle. Through the years, the District stressed to the public that it did not own much of the land and depended on easements for access to maintain its canals and water system operations. By the early 1980s, NID had been getting more frequent inquiries about walking or jogging along the canals. Here is how the District framed the issue in the Summer 1982 issue of the NID WaterWays customer newsletter: "We cannot give you permission because we don't own the property along most of our canals and ditches. We have been granted easements from the property owners for operation, repair and maintenance purposes. If you want to walk, run or ride along one of our canals, you must get permission from the private landowner. If it's okay with him, have fun, but please respect his private property and our facilities."

For several years, the District maintained this rather neutral posture, encouraging outdoor enthusiasts to get landowner permission if they wanted to cross private property. Yet as the public clamored for more local outdoor opportunities, there were conflicts with property owners and more fences being constructed to keep trespassers off private land. In September 1997, the Nevada County community group Friends of the Trails filed suit against a property owner on the Rattlesnake Canal off Brunswick Road, and NID was named as a co-defendant. The landowner had placed a gate on the canal in 1996, preventing longtime public access.

It was a hot topic for the local media. In October 1997, The Union newspaper conducted and published a reader survey that reported 387 people in favor of recreational use of NID ditches and 135 opposed. The issue was the subject of a broadcast debate on KVMR-FM in Nevada City, as well as letters and editorials in The Union.

The court case was heard in July 1998; the Nevada County Superior Court ruled in December that public access must be restored. The ruling, citing a California precedent, said that public use had existed for more than five years prior to 1972.

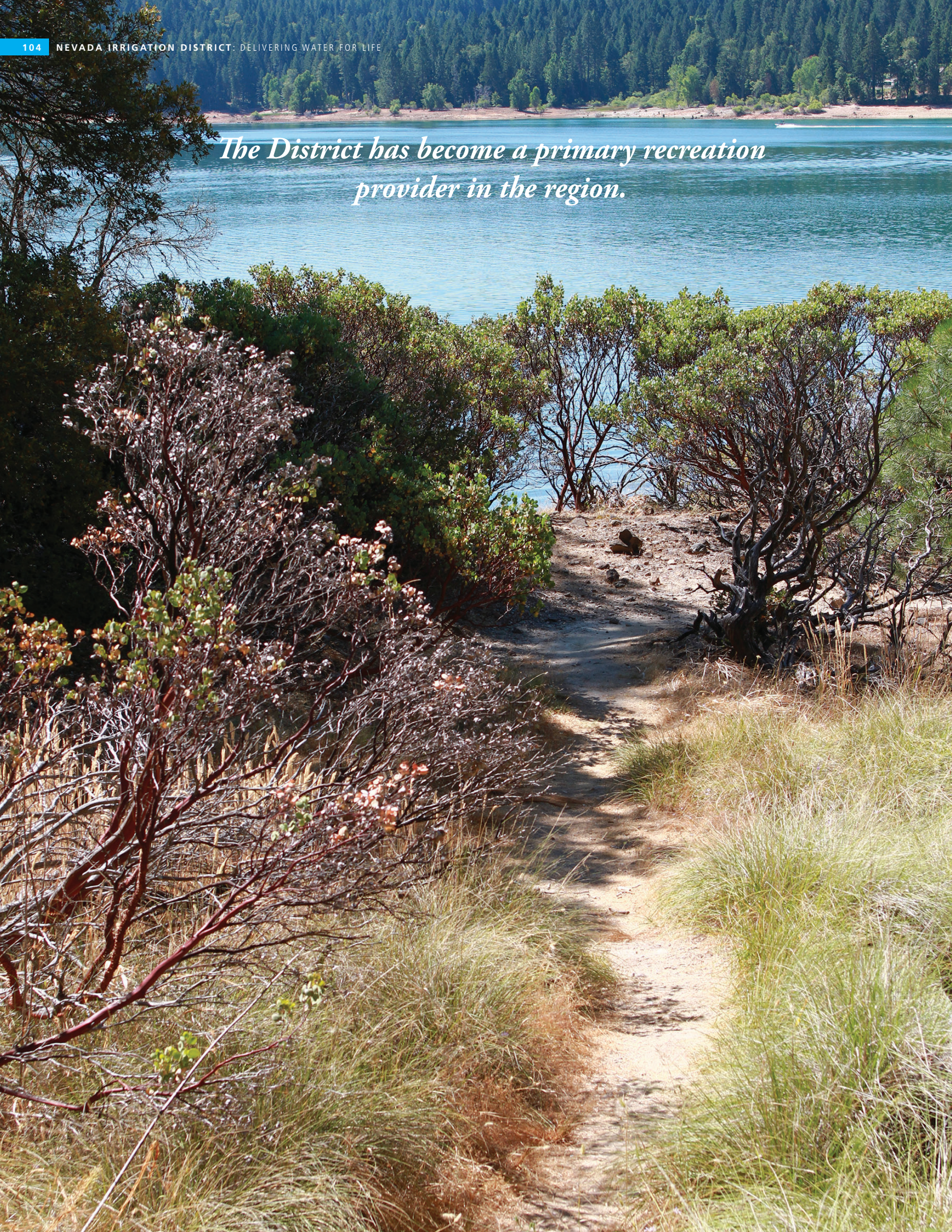
Friends of the Trails President Andy Wright called the trails "a unique community resource," and attorney Alan Haley said he hoped the ruling would discourage other property owners from blocking trails. NID chose not to provide evidence to show that public use would affect its water operations.

It was a time of changing land use in the Sierra foothills. Issues involving public trail use or the underground piping of existing canals also flared in Amador, Tuolumne and Placer counties.

Another case arose in 1999 when NID studied encasing a portion of the Grass Valley Canal in pipe. A business park was under construction on Litton Hill, just uphill from the canal and NID, and there was concern over potential runoff. NID wanted to preserve water quality in the canal, the source for the Grass Valley Water Treatment Plant. The canal, located between Hughes Road and Sierra College Drive and above the Nevada County Country Club, paralleled the Litton Trail, at the time a signature accomplishment of the new Nevada County Land Trust. NID eventually agreed to maintain the open canal after being urged to do so by community members, the Bear Yuba Land Trust and the City of Grass Valley.

Another community group, Save Our Historic Canals, lobbied successfully to preserve public use along Banner Mountain's Cascade Canal, which had become one of NID's most popular trails.

While access issues have appeared from time to time, the trails issue has been calm in recent years. Much of this is due to the partnership between NID and the Bear Yuba Land Trust, which is focused on pairing willing parties together in the public interest. ■



The District has become a primary recreation provider in the region.

CHAPTER 14

Water in the 21st Century: NID in the 2000s

Like organizations everywhere around the world, NID faced the unknown perils of what was known as Y2K, or the Millennium bug. It was feared that when the new century dawned on Jan. 1, 2000, computer systems would be unable to accommodate the new date and the resulting crash could create global havoc in computers and computer networks. Fortunately, the event passed rather unremarkably, and NID's computer functions moved onward without a glitch. That year, the District launched its first website at www.nid.dst.ca.us, and in 2007 a new address was obtained at www.nidwater.com. The website has been continually improved to be easy to navigate and packed with information.

By 2001, NID supplied 22,000 customers and operated on an annual budget of $38.5 million. The new millennium brought changes in customer service. By 2004, customers were requesting electronic bill payment options. The District obliged with the institution of payments via electronic transfers from customer bank accounts. In addition, the water meter retrofit program, in progress for several years, was completed, and all NID water meters could be read by radio wave from either hand-held or vehicle-mounted devices, eliminating the sometimes difficult task of locating and accessing meters on customers' properties.

NID has always prided itself on good relationships with the people it serves.

Change in leadership

In September 2002, James Chatigny retired as NID General Manager after serving in the lead role for 16 years. He was succeeded by Ron Nelson, who arrived in Grass Valley from Bend, Oregon, with a 20-year career managing the Central Oregon Irrigation District. Nelson would head the District for 10 years until his retirement in 2012.

The year also brought the retirement of Ernst "Ernie" Bierwagen, one of the longest serving (25 years) and most respected members of the NID Board of Directors. The Chicago Park orchardist stepped down in December 2002 after 25 years and six elected terms on the Board. He died February 12, 2004, at age 88.

Raw Water Master Plan and Urban Water Management Plan updates

Ron Nelson

In 2003, NID set out to update its Raw Water Master Plan (RWMP), first drafted in 1985, to provide a comprehensive plan to address the community's future water needs. In 1993, portions of the technical data for the plan were updated, but a formal plan update was not completed. The efforts consisted of two phases. Phase I provided the technical analyses necessary to verify the District's existing water supply, quantify expected future demand, evaluate the adequacy of the current water conveyance system and identify potential constraints within to accommodate current and future demand. Phase II, completed in 2005, consisted of identifying tentative plans (i.e., a range of capital improvement projects) for meeting future demands, based on the technical analysis completed in Phase I.

NID also went to work on its Urban Water Management Plan (UWMP), required by the state of California of larger water agencies, including updates every five years.

Notably, the updated UWMP informed Directors that the demand for drinking water within District boundaries would double with growth, from 18,500 customer connections to about 31,000 by the year 2030: "The good news is that you have supply in excess of your demand," observed Consultant Bob Young in his report. His colleague, Judi Garland, noted, "NID has sufficient water to meet customer needs through 2030."

Despite the favorable projections, Board President John Drew observed that NID and other water districts needed to address storage capacity in California's reservoirs as the state continued to grow.

Recreation turns 35 – works toward self-supporting business model

The year 2000 marked the 35th anniversary of NID's recreational facilities at Rollins and Scotts Flat reservoirs, as well as the reservoirs in the Mountain Division along the Bowman corridor. The District had become a primary recreation provider in the region. Still, directors maintained that water ratepayers should not cover costs of recreation. Getting creative to secure financing for projects, the District had obtained $3.4 million in grants during the past 10 years and was on its way to make recreation a self-supporting business model.

Rollins had four campgrounds with 243 campsites, and Scotts Flat had 185 sites. Camping, boating, fishing, swimming, water skiing and sailing in beautiful, forested surroundings were among the primary attractions. Meanwhile, the District worked with the U.S. Forest Service on the fourth update of the Mountain Division recreation master plan, which was originally drawn in 1969. Improvement of existing campgrounds, preservation of primitive areas and no changes to the roads were called for.

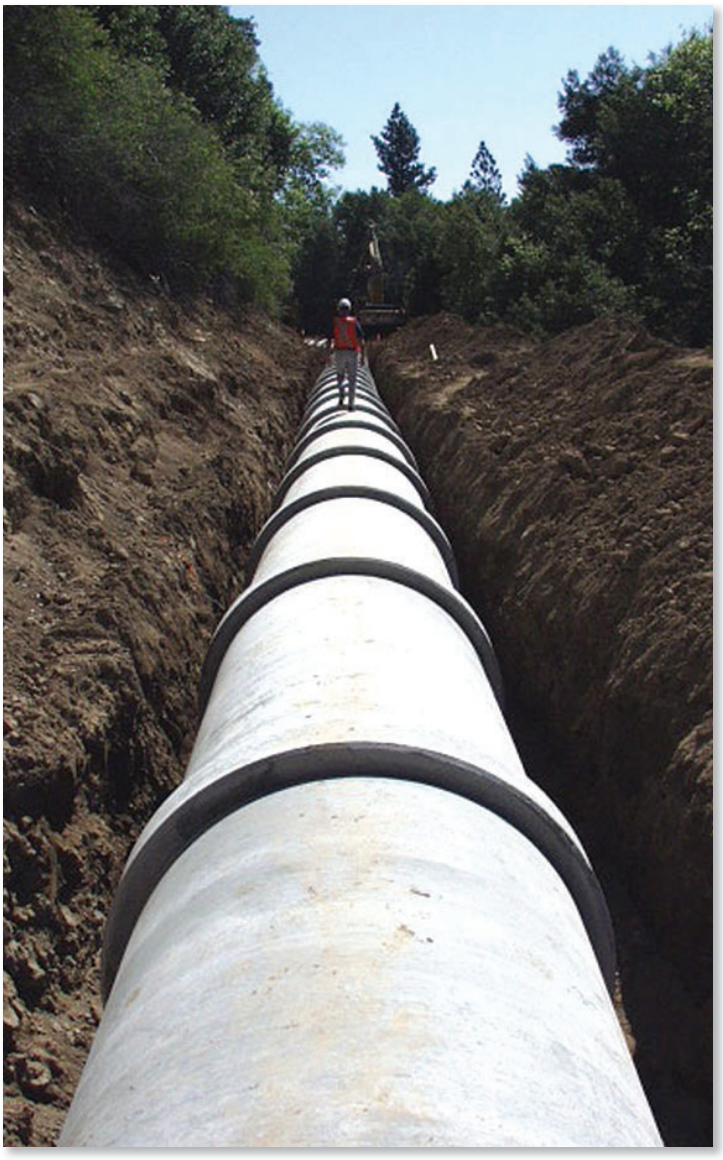
The Cascade Canal projects

At the beginning of the 21st century, NID began what would become a very controversial and lengthy project to replace six miles of the upper Cascade Bench Flume near Scotts Flat Reservoir. The job called for replacement of the old flume with seven miles of reinforced concrete pipeline. The project had been planned since 1998 and was estimated to cost between $16 million and $18 million. Construction was delayed, however, to address the concerns of neighbors and nearby property owners. Numerous hearings were held, and NID even hired an ombudsman to address the concerns raised in the community. When construction won final approval, a temporary barge was floated on Lower Scotts Flat Reservoir to pump water around the reconstruction of a main water supply line into Grass Valley and Nevada City. The project was completed in 2001 at a cost of $19 million and was recognized as 2001 Project of The Year by the Nevada County Engineers Association.

Upon completion, focus shifted to planning an upgrade of the Lower Cascade Canal, the second link in improving the overall reliability and capacity of a primary source of water to western Nevada County. This project would be directed through a much more populated area and would present NID with many challenges. Planning began in 2001 and was followed by several years of meetings, presentations and community outreach. An initial public workshop in December 2001 attracted more than 100 people. Outdoor enthusiasts wanted to preserve public access to walking trails along the canal; residents wanted to maintain the pastoral canal through their neighborhoods; and NID needed to supply more water to downstream constituents who were on a waiting list for water supplies.

An Environmental Impact Report, expected in 2004 and delayed until 2005, was issued in 2006. The 1,100-page report covered what had become known as the Lower Cascade Canal/ Banner Cascade Pipeline Project. General Manager James Chatigny said the project involved "the most complex, detailed and complete planning process we've ever conducted." He promised every voice would be heard. As planned and later completed, the project would divert some of the water from the Cascade Canal through a buried pipeline across the southern flank of Banner Mountain, supplying two of NID's main water treatment plants and wide areas of irrigation water use in southern Nevada County.

Several public hearings followed. Recreationists and canal area residents were pleased that NID would keep the canal in use, though at lower flows, but residents along the proposed pipeline alignment were not pleased at all with the prospect of major construction in their backyards. Differences were settled, and NID agreed to pipe treated water to impacted areas. The project, with 6.4 miles of large-diameter buried pipeline, five miles of treated water lines and numerous fire hydrants, was completed in 2012, more than a decade from its inception, at a cost of $41 million.



Upper Cascade pipeline is installed.

Together, planning and construction of the Upper and Lower Cascade Canal projects took 14 years to complete, with a total investment of $60 million. It was NID's largest construction effort since the Yuba-Bear Hydroelectric Project of the 1960s.

Water expansion to neighborhoods

A top priority became service expansion to unserved neighborhoods within District boundaries. In 2001, NID welcomed Deer Creek Park, a subdivision off Red Dog Road above Nevada City, into the NID water system. The 243 homes had been historically supplied through a small, private water system operated by the homeowners. Residents petitioned the District and agreed to pay $3,200 each to fund a two-mile long water main extension to bring water to their homes. A new tank followed later, along with connection possibilities for other nearby properties.

Enthused by the success of the project, in 2005 the NID Board of Directors declared its number one priority to be "expanding water service to areas of the District where it is not yet available." This led to development of a new Neighborhood Waterline Investment Program, under which the District would use revenues from its share of property taxes to help neighborhoods with the upfront costs of extending water service to their areas.

Residents of Cement Hill near Nevada City voted in 2007 to work with NID on installation of a new water system to serve their community. After a community facilities district was formed, NID obtained a $9.8 million low-interest loan to provide the up-front costs of the major construction project that brought treated drinking water to 241 parcels. The overall project was estimated at more than $10 million and included a new 1 million-gallon storage tank, a new pump station and several miles of cross country pipelines. The District planned on charging each property owner $1,385 in yearly assessments over 25 years, to be paid in either a lump sum or financed through the years. The Greater Cement Hill Neighborhood Association presented an award to NID for its work on the project. The plaque recognized the NID Board and staff for their "personal commitments to community improvement."

South Nevada County upgrades and looking to the future in Placer County

Attention turned to addressing water needs in southern Nevada County and Placer County. Projects included installing a new 3 million-gallon water storage tank next to an existing 2 million-gallon tank at the NID Shale Ridge Road tank site in North Auburn, as well as adding a new 800,000-gallon storage tank to replace and double the capacity of two old redwood tanks at Lake of the Pines.

Meanwhile, in Placer County, land uses in areas surrounding the growing city of Lincoln were changing from agricultural to residential, and as a result demands for treated drinking water were increasing. By 2003 the Lincoln city limits

North Auburn Water Treatment Plant goes solar in 2014.

had grown into NID's existing service boundaries. For comparison, in 2000 the population in Lincoln was 11,205, and by the end of the decade the census counted 42,819 people. NID's initial planning for significant expansion of treated water service in Lincoln began in earnest, and by 2006, a site was identified for a future water treatment plant to serve the growing water needs.

To become more energy efficient, solar energy became part of the District's portfolio when solar panels were assembled into three arrays at the North Auburn Water Treatment Plant off Locksley Lane in 2005. The installation cost was $538,000, half of which was paid by a matching grant from PG&E. The solar system was estimated to meet the electrical needs of 21 homes for a year.

Focus on water quality continues – no more drinking water from ditches

The trend toward domestic water service and water quality issues continued throughout the decade. In 2002, 80 NID raw water customers faced termination of service when the District received a state compliance order that required it to comply with the federal Safe Drinking Water Act, which prohibited the use of canal water for drinking, cooking and oral hygiene. Customers with no other source of water were told they must sign up for a bottled water delivery program. The number of known customers using canal water in their homes had been reduced from more than 1,000 over several years. NID worked with the affected water users, and by late 2002 there were 421 customers enrolled in the bottled water delivery program. NID was ruled in full compliance.

Mercury removal on the Bear River

NID grabbed headlines in 2006 when it proposed a novel approach to addressing a 150-year-old problem: how to remove mercury-bound particulate from sediment, a remnant of hydraulic mining practices used during the Gold Rush. During that period, miners hauled in and used elemental mercury to separate gold from ore. The elemental mercury remained in the Sierra Nevada watersheds and through erosion and sedimentation, has been carried into downstream reservoirs where under appropriate conditions, it can transform into toxic methylmercury and accumulate in the aquatic food chain. It is estimated that as much as 30 percent of the elemental mercury was lost to the environment during that time and has led to contamination of sediments throughout Sierra Nevada watersheds.

Although the mercury is not a threat to drinking water supplies, NID was anxious to address the situation. The District was successful in obtaining one of Cosumnes-American-Bear-Yuba Integrated Regional Water Management Group's (CABY's) first regional grants. The $100,000 grant, through the Sierra Nevada Conservancy, helped finance a pilot project to remove mercury from sediment while improving the water quality at the upper reaches of the Combie Reservoir. The innovative Mercury Remediation Project used centrifuge technology to separate the mercury from reservoir sediment. In 2009, NID hosted demonstrations of the mercury removal at the site, and work continued from there.

NID Assistant General Manager Tim Crough said at the time this was the first project of its kind in California and could become a model for other similar efforts. Findings from this pilot-scale project promised to provide valuable information to state regulators and help water managers address mercury in the aquatic food chain.

NID employees load the Knelson concentrator.

Elizabeth George Water Treatment Plant expands

Although the recession tabled many projects, NID moved ahead with the vital expansion of the E. George Water Treatment Plant near Nevada City. The $14.9 million upgrade included new filtration systems and expansion of the plant's capacity from 9 million to 24 million gallons per day. The project was completed in 2009.

From 2018 - 2020, the District's project to help remove mercury and restore capacity in the reservoir by removing nearly 50,000 cubic yards of sediment from Combie Reservoir was a success. NID teamed up with a number of partners: The Sierra Fund, the U.S. Geological Survey, the California Department of Water Resources (DWR), NV5 Global, Inc., Great Lakes Environmental and Teichert Aggregates. Financing was secured through a $5.5 million grant from DWR while the District provided $2 million to the effort.

The project was recognized by the American Society of Civil Engineers Sacramento Section as its "Small Project of The Year for 2018." The benefits and scientific findings from this project are valuable to state regulators and water managers, and the project can be replicated in other affected reservoirs in the future.

FERC relicensing of the Yuba-Bear Hydroelectric Project

District leaders in 2002 began preliminary planning for the Federal Energy Regulation Commission (FERC) relicensing of the Yuba-Bear Hydroelectric Project. The project's original 50-year license was issued in 1963, and scheduled to be renewed by 2013, still a decade in the future. The formal planning process was launched in 2005. The work involved hundreds of meetings with local, state and federal agencies, nongovernmental organizations, and other stakeholders as well as completion of multiple studies on resource management, stream flows, habitat protection, public recreation and more. These studies went beyond the original limited hydroelectric focus and included detailed discussions about the intertwined water systems of NID and PG&E's Drum-Spaulding Project, which is vital to the District's upper division water conveyance system.

Community connections – in the classroom and in the field

Throughout the decade, NID continued to incorporate new ways of doing business to connect with the community. For example, in 2005, the District formed the NID Ambassador Team, a group of 16 employee volunteers who trained and prepared to spread the District's story in the community. Those participating would visit schools and civic organizations to provide information about NID, its history, operations and role in the community.

Before speaking in public, the Ambassadors participated in various training sessions, including topics about District history, its annual budget, the Lower Cascade Canal/Banner Cascade Pipeline Project and Integrated Regional Water Management Planning, as well as tours at the hydroelectric operations at the Rollins Powerhouse and the Scotts Flat Powerhouse. In August of 2005, the team took the spotlight at NID's booth at the Nevada County Fair. They readily provided information to the public during the popular week-long festival. Following the debut at the fair, members of the team regularly were booked into service organizations and schools to give presentations.

In a different type of community support, NID's Vegetation Management Department began working with local and state organizations to find environmentally friendly alternatives to weed control along its canals. NID was operating and maintaining more than 425 miles of irrigation canals in Nevada, Placer and Yuba counties. The goal of the District's vegetation management program was to control algae and vegetation that posed challenges to reliable and successful water delivery. The presence of this growth in and near irrigation canals can easily challenge flows, consume canal system capacity, clog water intakes and serve as habitat for other pests. From the onset of the program, NID took the lead from federal, state and local regulations.

The program was broad reaching: Practices encompassed education and prevention and control methods that included physical, mechanical, herbicidal and biological controls.

In the 2000s, the District began new studies with the Nevada Placer Weed Management Agency and University of California, Davis, consultants to identify environmentally friendly methods of weed control. By 2008, the District had purchased a tractor-mounted thermal weed control unit. It proved to be useful in controlling growth of weed seedlings by using steam at 132 degrees or more. The use of approved herbicides continued to be the most successful method. Other methods being used were grazing goats and sheep, vinegar spray, barley straw, mowing and manual removal.

Recession hits – NID cuts spending and delays projects

The 2008 financial crisis and the ensuing Great Recession affected NID as they did across the nation and around the world. Consumer spending dropped, real estate markets collapsed, and the economy slowed. NID General Manager Ron Nelson, who led the District through the recession, later said that looking back on his 10-year career, that period was the most difficult time. Nelson said the District cut spending and delayed projects. He expressed pride that despite the financial challenges, NID made it through the recession without a single layoff.

Water rates restructured

NID water rates needed to be significantly restructured in 2008 after studies showed that treated water rates covered less than 60 percent of the District's costs in providing the service, and raw water rates were covering just 44 percent. NID had used hydroelectric, property tax and other revenues to subsidize the shortfall. The restructuring did not have a large impact on customers; it came to less than $1.50 per month for the average treated water customer.

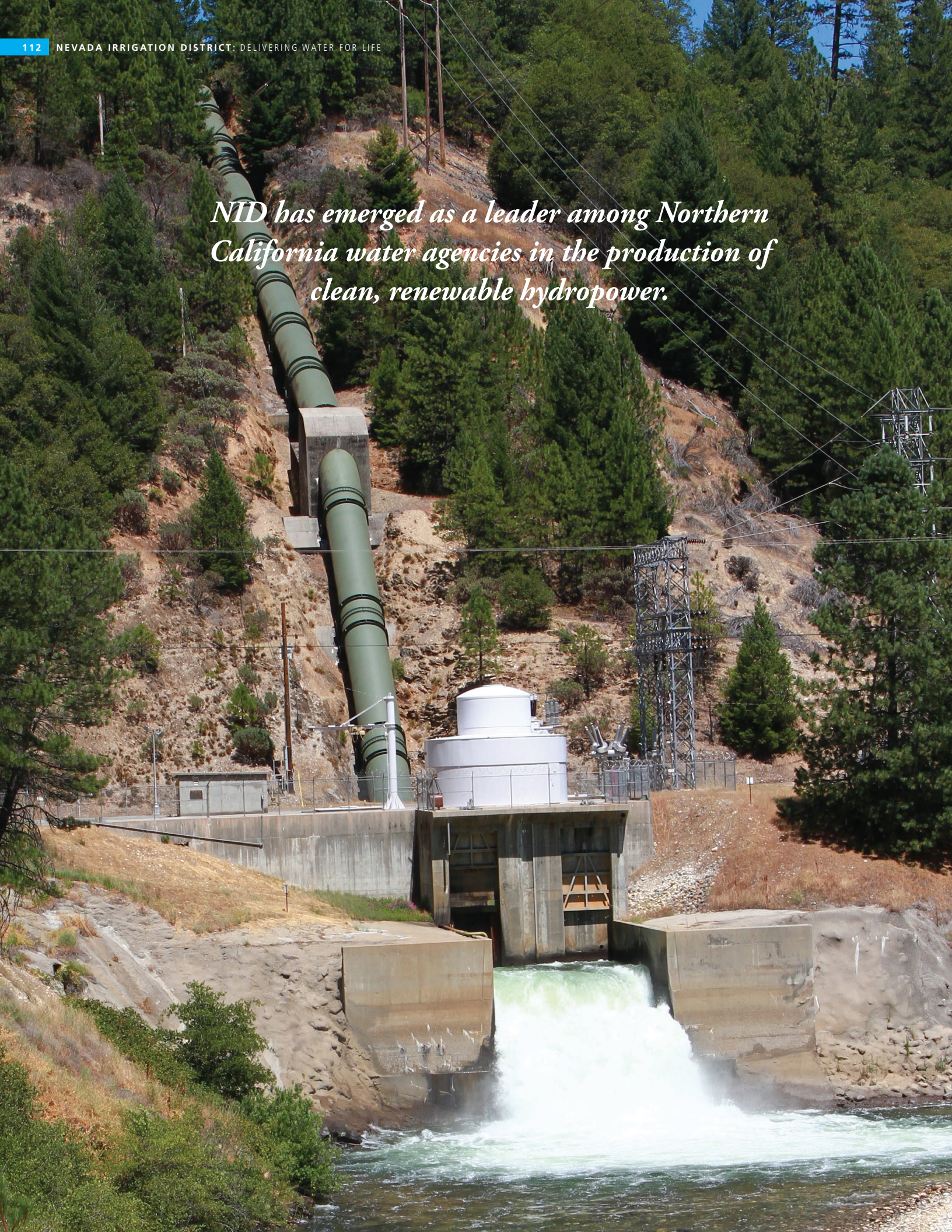
In 2009, California continued to search for new ways to make the state's water supply go farther. Gov. Arnold Schwarzenegger called for a statewide water use reduction of 20 percent by 2020. "Conservation is one of the key ways to provide water for Californians and protect and improve the Delta ecosystem," Schwarzenegger said at the time. NID, other water suppliers and the Association of California Water Agencies (ACWA) questioned the fairness of such a measure.

"It's a worthy goal," Nelson said, "but it must be implemented fairly. There are different needs in different parts of the state." ■

Mercury settled in the bottom of a bottle.

49 Fire causes extensive damage

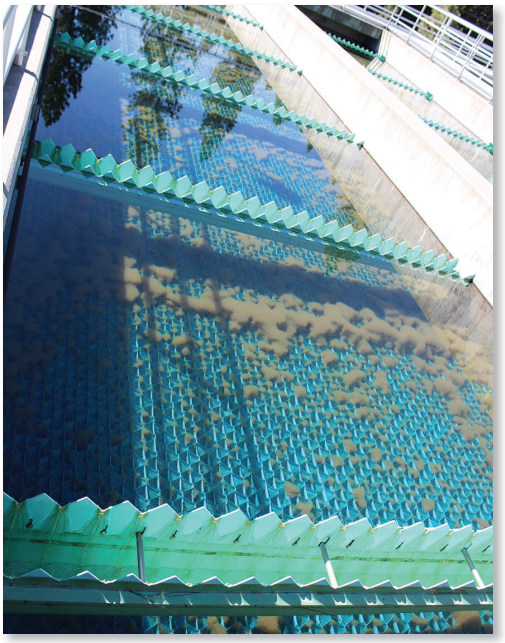
On August 30, 2009, the 49 Fire swept through North Auburn, burning more than 343 acres and destroying 63 homes. In the middle of the fire area, NID's North Auburn Water Treatment Plant was spared, but a historic 1865 Gold Rush stamp mill near the plant's entry was charred. Electrical power was cut; NID crews rushed in a generator, opened two interties with the neighboring Placer County Water Agency, and kept water flowing to District service areas. Nineteen District employees responded to the wind-driven fire that broke out on a Sunday afternoon.



NID has emerged as a leader among Northern California water agencies in the production of clean, renewable hydropower.

CHAPTER 15

NID Focuses on Modernization: the 2010s



An NID water treatment facility.

Watershed stewardship, modernization of an aging water system, conservation efforts, the growing demand for treated drinking water and four years of the worst drought would be guiding issues as NID moved through the 2010s.

By 2010, the District's budget had reached $60.7 million, and water users faced a modest 2.6 percent increase in water rates. The District pressed forward with long-planned and critical upgrades of the D-S and Cascade canals, which were two main water sources in the Grass Valley and Nevada City area. Both projects had been delayed out of concerns raised by some property owners and local nongovernmental organizations, which feared the impacts the project might bring.

In southern Nevada County, after several years of planning, the District and residents of Rodeo Flat near Lake of the Pines began work on the Rodeo Flat Assessment District. The $1.8 million treated water improvement project brought water to 31 parcels to the southwest of Lake of The Pines.

The Auburn Ravine fish ladder helps salmon and steelhead trout progress upstream to spawn.

Property owners, plagued by weak wells and water shortages, had voted 29-2 to assess themselves $28,000 each for the water supply, which could be paid up front or financed by NID. The work included 8,000 feet of new main lines to connect the area to the Lake of The Pines water system, a new pump station, seven fire hydrants and a parcel of land for a future water storage tank. Rodeo Flat, following Cement Hill near Nevada City, became a second successful example of the District's growing Community Investment Program.

Wooden flumes replaced

In February 2010, the NID Board of Directors awarded a $4.9 million construction contract to T&S Construction Co., Inc. of Sacramento to replace the first eight of 32 old, metal and wood flumes on the D-S Canal near Nevada City. The flumes dated to 1926-28 and were leaking and showing signs of age. They created bottlenecks in the system and limited flows to downstream customers, who were on a waiting list for water. This project was a significant step in improved water reliability to Grass Valley and Nevada City. The overall project would be completed for $6.5 million.

Hydroelectric moves forward – New power plant comes online, FERC relicensing proceeds

Also in 2010, the District completed and began operations of a new 500-kilowatt hydroelectric power plant at Combie Reservoir. The new Combie North Powerhouse replaced an aging generator that had been installed in 1983 under an agreement with a private developer. Revenue

The Hemphill Canal diversion

from the hydropower would allow the District to recoup its $3 million investment in eight to nine years.

NID's continuing efforts to finalize a new federal license for operation of the Yuba-Bear Hydroelectric Project moved forward. In June 2010, as a necessary step in the process, Directors authorized staff to negotiate a new power sales agreement with PG&E. On May 12, 2012, the NID Board approved the agreement, saying power sales were estimated at $20 million per year and expected to grow to $30 million over the 20-year life of the contract. NID assumed responsibility for operation and maintenance of the power system, which had been under PG&E management. Since 2011, the District has been working on completing a multiyear effort to relicense the Project, working with regulatory agencies, regional nongovernmental organizations and other stakeholders. Once complete, the new FERC license will continue to bring many benefits to customers, the community and the environment for years to come.

NID has emerged as a leader among Northern California water agencies in the production of clean, renewable hydropower. Operating seven hydropower plants with a total of 82.2 megawatts of capacity, it generates enough electricity to supply the District's own energy needs plus that of about 60,000 homes per year. NID's hydropower facilities include 13 reservoirs, 20.75 miles of pipes, 9 miles of transmission line, and various levels of flumes, tunnels and open ditch canals. NID's hydroelectric system is one of California's most complex water conveyance systems.

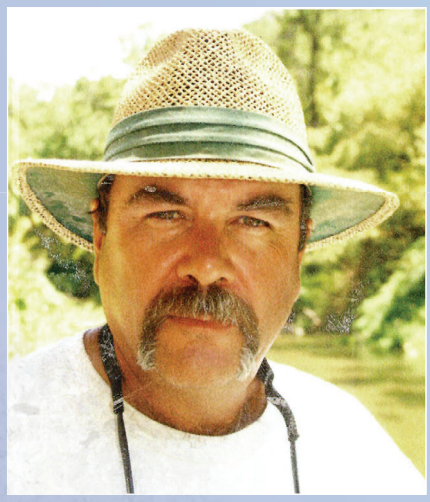
Fish passage – new ladder in Auburn Ravine increases the number of salmon

Fish passage became a familiar term in 2011 as NID began a watershed improvement project on Auburn Ravine in Lincoln. An Auburn-based community group, Save Auburn Ravine Salmon and Steelhead (SARSAS), encouraged the District to improve its water measurement station on the creek just downstream of Highway 65, which was limiting the upstream migration of fall-run chinook salmon and steelhead trout.

The Auburn Ravine fish passage provides migrating salmon and steelhead with support to pass around a gauging station and continue their journey to upstream spawning areas.

Crews replaced old wood and metal flumes dating to the 1920s with pipelines to improve the reliability of water delivery.

Dedicated employee delivers 500 billion gallons of water before retirement



After 33 years as a Water Distribution Operator, Fallon Murch retired in June 2011. At the time Water Superintendent Larry Markey estimated that through his career the dedicated employee "wheeled and delivered" – helped supply – 500 billion gallons of water to District customers, more water than any employee before him. That equated to five and a half times of every drop of water the District can store.

What made Murch a stellar employee was his acquaintance with his customers, his dedication to them, and his knowledge of water and the importance of water to agriculture, as well as a relentless work ethic. Not too many employees have a facility named after them – Murch's slough, between the Auburn Ravine II and the Doty South Canal. He devised a method of defying gravity in the slough, where water could be flowed in either direction, allowing reliable supplies to his customers.

One of Murch's trademarks was always "telling it like it is," a carry-over from his father, who also retired from the District with 30 plus years of service.

Upon retirement, the younger Murch noted that he loved his job because of his customers and colleagues. His said his father "had a good run" at NID, and he wanted to make his father as proud of him as he was of his father.

In cooperation with SARSAS and other community stakeholders, NID replaced the measuring station dam with a series of transitional pools, gentle drops and tapered banks to create what was described as a "nature-like fishway." The $1.2 million project was completed on a very short schedule, which was dictated by the weather as well as the agricultural water needs of downstream customers. In fall 2013, more than 200 fall-run chinook salmon were counted in Auburn Ravine above the new fish ladder.

The creative project earned accolades in Placer County and the California water industry. It became one of six statewide finalists in the Association of California Water Agencies (ACWA) environmental awards program for the Clair A. Hill Water Agency Award of Excellence.

NID next turned to finding ways to support fish migration further upstream. By 2016, studies were underway on the Hemphill Canal diversion, a three-foot-tall seasonal dam installed each irrigation season to supply NID customers in the Lincoln area. In ongoing cooperation and coordination among local nongovernmental organizations, community groups, stakeholders, federal and state agencies, environmental review and planning continue in order to determine the future of Auburn Ravine at the Hemphill diversion.

Old reservoirs replaced with new storage tanks on Banner Mountain

The Banner-Taylor Reservoir site is located along Banner Lava Cap Road, adjacent to and downhill from the Elizabeth L. George Water Treatment Plant. It had been an old raw water reservoir until 1992 when it was divided, lined and covered to protect and store treated water from the nearby plant.

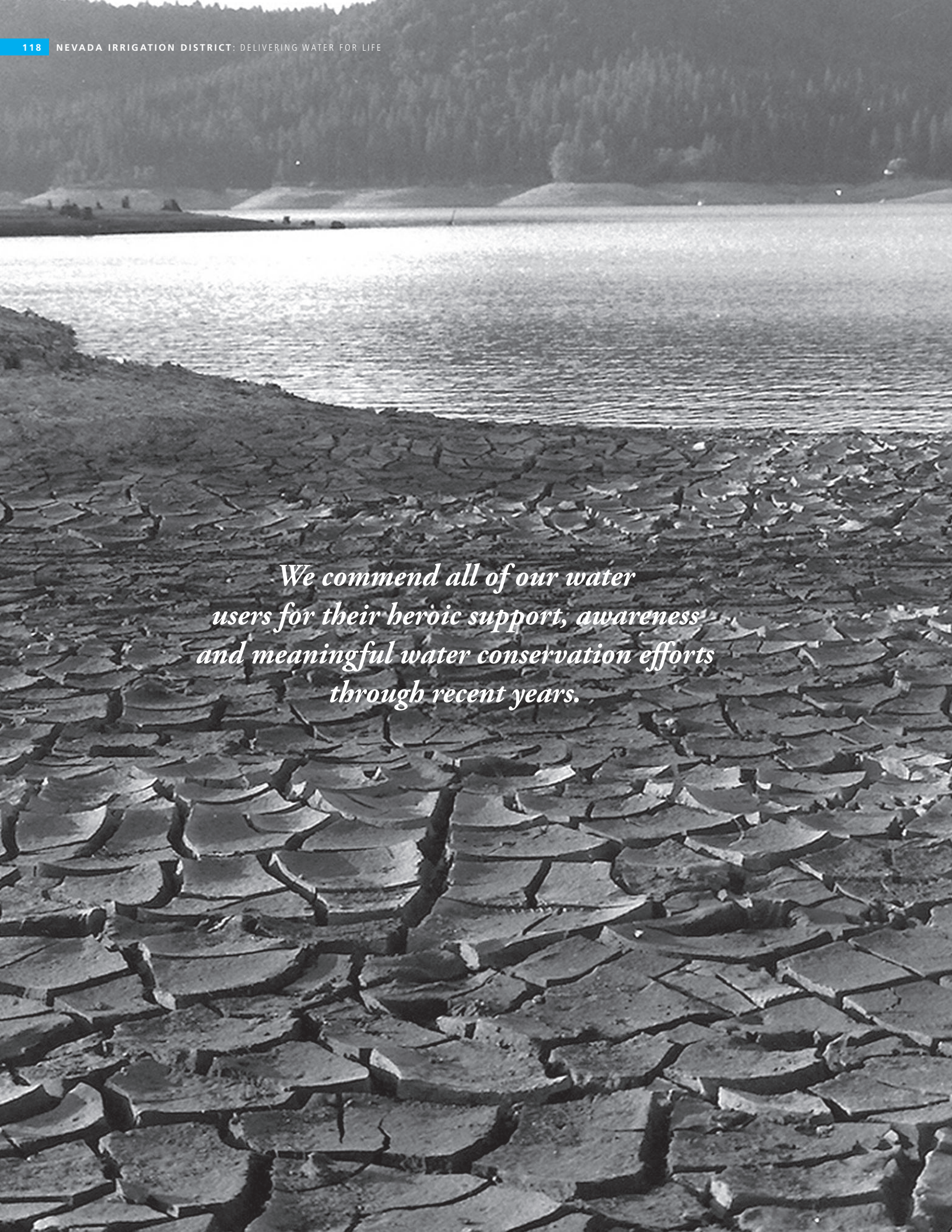
With rising costs to maintain the reservoirs and evolving state water quality regulations, the NID Board of Directors in August 2011 approved the construction of two modern water storage tanks to replace the covered reservoirs. It was determined that 10 million gallons of water storage would be adequate to serve the community for the next 20 years. The project was budgeted at $7.9 million.

With many homes surrounding the 4.7-acre bermed reservoir site, concerns were expressed about views of towering water tanks. The reservoirs were drained and then deepened so that the large tanks could be partially buried and would not be visible from surrounding neighborhoods. Work on the first 5.9-million-gallon tank began in 2012. Once it was in operation, construction began on the adjacent 4.6-million-gallon tank. A site was set aside for a future third tank. When work was completed in 2014, the two circular concrete tanks would store 10.5 million gallons of treated drinking water to serve the greater Grass Valley-Nevada City area.

A new inlet under construction for the D-S Flume.

In 2015, the Banner-Taylor Reservoir makeover was recognized by the American Public Works Association (APWA), Sacramento Chapter. The project was cited for Environmental Achievement in Water Projects and named as the chapter's 2015 Project of The Year. ■

One of many NID irrigation canals.



We commend all of our water users for their heroic support, awareness and meaningful water conservation efforts through recent years.

CHAPTER 16

Drought Impacts Reach Far and Wide

1976 drought.

Although Californians have experienced drought before – they are a recurrence given the state's Mediterranean climate characterized by warm, dry summers and mild winters – the four-year period between fall 2011 and fall 2015 was the driest since record keeping began in 1895. The drought was worsened in 2014 and 2015 with the two hottest years recorded in the state's history.

The National Weather Service defines a drought as a deficiency in precipitation over an extended period resulting in water shortages that cause adverse impacts on vegetation, animals and people. The implications of drought are significant. The primary source of the state's water supply is precipitation in the form of rain and snow. Most importantly, the Sierra Nevada mountain range accumulates snowpack during the winter that slowly melts in late spring. This natural pattern allows for runoff to flow downstream and fill reservoirs for consumptive and environmental use throughout the summer. In fact, Sierra snowpack stores about 65 percent of California's total water supply and historically can be categorized as California's largest natural reservoir.

During a drought, Scotts Flat Reservoir shows much shoreline on May 15, 2015.

In January 2014, NID water storage remained near normal for the time of year, but there was virtually no snowpack falling to replenish it. The District already had been very conservative with water releases to save as much water in storage as possible and prepare for a dry, hot summer and dire prolonged conditions. Carryover water storage, the amount of water carried over in reservoirs from season to season, remained a key part of NID's plan. The Stage II drought conditions specified that no less than 75 percent of average carryover storage would be saved for 2015. That would be about 110,000 acre-feet of water remaining in NID's 280,380 acre-foot-capacity system.

California Governor Jerry Brown declared a statewide drought emergency on January 17, 2014, and the state legislature allocated billions of dollars to provide drought relief and improve water management. In light of the extremely dry conditions and the lowering water storage levels, NID also took immediate actions to ensure adequate supplies throughout the summer months and longer.

The District enacted immediate water conservation measures for customers, and Directors authorized staff to implement initial portions of the District's Drought Contingency Plan, which specifies five stages of actions to be taken when available water supplies drop below certain levels. A Stage 1 alert could allow normal water operations while a Stage 5 critical water shortage emergency would require water use reductions of 35-50 percent.

The District called for a voluntary 20 percent water use reduction by all NID water users, convened a citizen Drought Hardship Committee, froze all new or increased sales of winter irrigation water, and limited the water available for fire department practice drills and flow testing of fire hydrants. The record-low snowpack in 2015 in the Sierra Nevada was unprecedented. In some portions of the region, snow water levels were measured at just 5 percent of the historical average.

In the grips of drought, NID turned to novel ideas to ensure reliable water delivery during the drought and into the future. Large infrastructure improvements, regionalization of water systems and innovative projects were proposed and completed.

The District worked with community partners to educate the public about the impacts of drought and encourage customers to make conservation a way of life. For example, in a school education program launched in 2014, the District joined with the Placer County Water Agency and the cities of Grass Valley and Nevada City to underwrite "The Great Water Mystery," a program conducted by the South Yuba River Citizens League (SYRCL). The program featured "Detective Drizzle," who visited K-8 schools in Nevada and Placer counties and taught students about the importance of water conservation.

Centennial Water Supply Project is proposed

It was in 2014-15 that NID leaders began to revisit a water storage concept that dated to the District's formative years. A potential reservoir site, located on what was then the Parker Ranch along the Bear River between what are now Rollins and Combie reservoirs, was first identified in a 1926 report to the NID Board of Directors by founding NID Engineer Fred Tibbetts. The Parker Reservoir site was selected by Tibbetts as his first choice for a reservoir. He noted that additional government funding could be available if the reservoir collected and trapped hydraulic mining debris, an idea that could have limited the buildup

that would be seen in years to come. Parker Reservoir was not built during the District's formation, as the focus was placed on the upper mountain division. The plan was again shelved in the 1950s as NID leaders turned their attention to the Yuba-Bear Hydroelectric Project and construction of Rollins Reservoir, again saving the Parker site as a future option.

In the 21st century, NID's dependence on the mountain snowpack for water storage against the backdrop of a warming climate signaled the need for lower division water storage that could better capture rainfall and snowmelt runoff. In August 2014, the District filed with the State Water Resources Control Board to exercise its water rights on the Bear River.

Board Director Nick Wilcox noted, "Climate change is shrinking the snowpack, our largest reservoir, and NID must adapt and plan for the future. The solution of mid-elevation storage could capture runoff from rain and snowpack runoff from higher elevations."

The proposed Centennial Water Supply Project would consist of a 110,000-acre-foot reservoir. The body of water would extend upriver from just above Combie Reservoir to two miles downstream of Rollins Dam (west of Colfax). In total, the reservoir would be just over 6 miles long, and would span the Placer and Nevada county line within the District boundaries.

In addition to water storage, the reservoir would provide wildlife habitat and low-impact recreational activity, including pedestrian trails, swimming, kayaking and a 5 mph maximum speed on the reservoir. District analysis pointed to economic, environmental and social benefits that included improved water supply reliability, enhanced groundwater recharge, managed flows for aquatic species protection and enhanced carbon sequestration. District documents further noted the project would provide a 6-mile-long firebreak with enhanced water resources to support local food production. Overall, the project would improve water supply reliability for NID's treated and raw water customers into the future.

The site, with most of the land in public ownership (NID on the Nevada County side and the State of California on the Placer County side)

Bowman Lake

Although crews faced challenges to keep icy waterways flowing in February 2016, NID welcomed the end to the drought.

was seen as worthy of further study. Planning and land purchases commenced, and local opposition began to take shape as the effort moved forward.

Facing opposition by some residents and environmental organizations, the Board voted in 2019 to limit spending on the project and turned its attention instead in updating the Raw Water Master Plan. The Plan for Water (formerly called the Raw Water Master Plan) is designed to be the District's planning tool that will help guide NID's capital improvement decisions related to its water system over the next 50 years. The plan will project ranges of potential water demands and supplies, future conditions relating to regulatory and land use needs, and the potential effects of climate change. In developing the plan, NID seeks to align water resource decision-making with community values and district operational needs. When complete, the plan will show how a variety of future water supply and demand scenarios could be integrated to ensure the community enjoys the same high-quality, reliable water system it has now.

Remleh "Rem" Scherzinger

Infrastructure projects improve the reliability of NID water systems

While the drought endured, NID was at work on infrastructure projects to bolster its water delivery system and ensure customers were getting their water as efficiently as possible.

For example, in June 2014 the NID Board of Directors awarded a $2.5 million contract to Pacific Gateway Constructors, Inc. for construction of a new pump station on the D-S Canal above Nevada City. This would allow water to be pumped uphill to the Cascade Canal system and across Deer Creek to the Snow Mountain Canal system, improving backup supplies for each area.

The District also built a key intertie near Brunswick and Idaho-Maryland roads. This connection of the E. George and Loma Rica treated water systems would provide for backup water supplies to areas as far as Chicago Park and Alta Sierra.

NID also began to fund its "Backbone Extension Program" to expand the main treated water system and also a more localized Waterline Extension Program for neighborhood improvements. The program proved to be very helpful to residents between Alta Sierra and Lake of The Pines in areas with large parcels and failing water wells. By 2015, mainline extensions began to connect the areas.

A significant planning project continued downstream in Placer County as NID worked with agencies and residents of the Lincoln area where homes were replacing farms and ranches and demand for treated water was increasing in areas that NID had supplied with irrigation water. A creative partnership between NID, PCWA and the city of Lincoln helped facilitate water supply availability in the area.

Post-drought: conservation as a lifestyle

High hopes for a return to "normal" precipitation continued as the 2015-16 season approached. NID officials noted the relationship between water supply and growing concerns about climate change; it was reported that the previous winter's average minimum daily temperature at Bowman Reservoir was 32.1 degrees, the first time it had been above freezing in at least 120 years.

At last, the 2015-16 precipitation year turned out to be wet and would begin to ease local and state drought concerns. In May 2016, the State Water Resources Board suspended its mandatory statewide 25 percent reduction in urban water use, and communities began to set their own conservation standards after a wet winter and a year of enormous savings in urban water use.

Locally, the precipitation year ended with 79.92 inches of rain and snow, or 116 percent of the 130-year average. As snowpack runoff continued, NID on July 11 reported its reservoirs were at 93 percent of capacity and holding 116 percent of average storage for the date.

The Combie Reservoir Sediment and Mercury Removal Project team members were honored as winners of the prestigious 2018 Small Project of the Year award, presented by the American Society of Civil Engineers, Sacramento Section.

General Manager Rem Scherzinger took pen to paper in a column, "Recovering from the Drought," as the District rebounded from a lengthy four-year dry spell in spring 2016: "After four years of drought, it's not an easy or balanced recovery and, unfortunately, it appears that NID customers could be called upon to conserve serious amounts of water."

Scherzinger wrote: "We commend all of our water users for their heroic support, awareness and meaningful water conservation efforts through recent years. These efforts have allowed the District to achieve or nearly achieve the ... conservation requirements handed down by state water regulators. ... Water conservation is here to stay and we are doing our part to operate our water systems as efficiently as we can and offering help and assistance to our customers in their efforts to save water. Thank you once again for helping all of us through the difficult four-year drought."

After serving NID for 7.5 years, the general manager gave his notice in July 11, 2020. Assistant General Manager Greg Jones was named interim general manager. ■

This story of NID is for those founders who began a dream, for those employees who turned that dream to a reality, and for the future leaders who will continue the dream into a legacy.

CHAPTER 17

Looking Forward to the Next 100 Years

NID employees trek across English Meadow to study the meadow in preparation for a restoration project.

Leading into its 100th year celebration, demand for treated drinking water has driven NID's customer growth. In 2021, as the District marked its centennial anniversary, three of every four customers use piped, treated water.

When the doors of the District opened in 1921, the foothills communities were yearning for a reliable water supply for irrigation of farms and fields. Within a matter of years, the backbone of NID – the high Sierra Nevada snowmelt – was secured, and high-quality water was flowing to farms, fields and residences. Today, NID produces more than 3 billion gallons – about 9,000 acre-feet – of treated water a year for drinking and use around homes and businesses. Generally, treated water is available in the more populated areas. In recent years, the District has been successful in working with local property owners to form local water quality improvement districts in remote areas where it is difficult to extend treated water main lines. NID's treated water service areas are located in and around Grass Valley and Nevada City, Banner Mountain, the Glenbrook Basin, Loma Rica, Alta Sierra, Lake of the Pines, Penn Valley, Lake Wildwood, Smartsville and North Auburn.

Environmental stewardship is a top priority for NID. District experts and other consultants routinely assess the health of the forests and take action to ensure the watersheds function properly.

To treat water for drinking and household use, NID operates a network of six modern plants to supply portions of Nevada, Placer, and Yuba counties.

In addition to treated water, an average of 145,000 acre-feet of untreated raw water is delivered for irrigation each year. Of the estimated 97,000 irrigable acres in the District, NID customers irrigate more than 30,000 of those acres. Ninety percent of NID's raw water is used for local agriculture with a total of approximately 5,400 raw water customers.

Through the decades, the District has continued to expand and improve its water delivery systems while adding water treatment plants, hydroelectric generation powerhouses and recreation facilities. It has established itself as a competent, efficient special district, looking to the future with confidence.

The District isn't resting on its laurels, however. NID continues to advance its services to ensure another 100 years of reliable water delivery. A growing concern is climate change, a phenomenon that early NID leaders never could fathom. A University of California, Los Angeles (UCLA) study in 2018 found that in the Sierra Nevada foothills climate change will raise temperatures between 5 and 7 degrees by the end of the century if carbon emissions are not significantly reduced. Higher in the mountains, NID's primary water source, the effects of climate change already are being felt.

The Sierra snowpack acts as a natural reservoir that holds water in a frozen form until it gradually melts over spring and summer. The water flows into reservoirs and conveyance systems, and then downstream for irrigation and household use. Studies indicate climate change is expected to shrink the Sierra snowpack as temperatures heat up and more precipitation falls as rain rather than snow. This will limit the availability of water, lessen the dependability of water system infrastructure and diminish the quality and health of the local watersheds.

NID works to improve watersheds and forest health

NID is keenly aware of the importance of increasing watershed resiliency to the effects of climate change and ensuring the water system infrastructure will continue to provide a dependable, sustainable water supply and conserve the resources provided by these important headwater watersheds.

The District has ongoing projects to promote forest health and address the impacts of a warming climate. For example, its forest thinning projects reduce fire threats and increase the amount of water available within a watershed. Dense forests use more water than thinned forests, and it is estimated forest management can quickly recapture 5-10 percent of a watershed's normal water yield. Additionally, selectively thinned forests are able to grow faster, allowing trees to capture more carbon, which helps to reduce global warming and other effects of climate change.

Fuel reduction around Scotts Flat Reservoir has been a priority.

NID also manages its forested property to promote mixed-age and multispecies communities. This makes the trees more resilient to pests and disease while decreasing catastrophic wildfire threats.

For example around Peninsula campground's 70 campsites in forested land and on Rollins Reservoir lakefront property, more than 80 acres were treated to reduce the number of dying and hazard trees, as well as overgrown vegetation. The pre-treatment plots had more than 2,700 trees per acre. After the work, the count was 140 trees per acre.

Higher in the Sierra, four years of restoration work continued in English Meadow (elevation 6,152 feet) where the Middle Yuba River begins its journey and flows through on its way into Jackson Meadows Reservoir. NID's project will reconnect the meadow to the natural watershed of the Middle Yuba to increase functionality. NID and partner research groups believe more water will accumulate as the spongy ground absorbs snowmelt runoff and percolates it through the soil. The water will remain in the meadow longer into the year. This will increase groundwater and reduce sediment into Jackson Meadows Reservoir, saving water storage capacity.

NID is also working with local schools, community residents and visitors to provide education on watershed resilience, healthy forest ecosystems and long-term water resource management. In combination, these projects create more resilient watersheds that can provide the ecosystem services we are all dependent upon: clean air, clean water, productive soils, and a valuable economic support system for rural communities.

Reducing the risk of wildfire

As a water purveyor whose mission is to provide a dependable water supply to the community, NID's pressurized and non-pressurized systems can also be a valuable asset in firefighting. Climate change intensifies wildfires, which are a growing concern in the higher Sierra and foothill elevations as climate change sets in and populations increase. The threat is real; two wildfires that devastated communities stand out. In 2017 the Tubbs Fire in the hills of Santa Rosa burned 34,000 acres and killed 20 people. The next year, the Camp Fire in Paradise burned 153,336 acres and killed 85 people. In 2020 wildfires burned nearly 4.4 million acres, destroying more than 10,000 structures and causing more than 30 deaths. Gov. Gavin Newsom declared a state of emergency in August, reporting that firefighters were battling 367 wildfires statewide. Calculating the devastation, California passed the record for the worst year in history for the amount of burned land.

NID works hard in many different ways to reduce wildfire risks and keep the District's customers and communities safe. All departments are engaged in work to strengthen fire resiliency and ensure facilities and infrastructure are secure in case of a wildfire. These activities range from thinning trees and vegetation on hundreds of acres, adding more than 2,550 neighborhood fire hydrants, installing backup generator systems in case of power outages and working with local and state agencies to share resources in an emergency.

Examples include:

Raw water is made available from reservoirs

NID taps snowmelt high up in the Sierra and uses gravity via 500 miles of canal to bring water to customers. Along the way, the water fills nine storage reservoirs, 16 water distribution reservoirs and four hydroelectric reservoirs with a storage capacity of more than 350,000 acre-feet (1.14 billion gallons). This water can help first responders, including CALFIRE and local fire districts, fight fires from the ground and air. CALFIRE's helicopters

What is a watershed?

A watershed is the area of land that water flows through into a stream, river, lake or reservoir. Humans and natural ecosystems are dependent on healthy watersheds. Healthy watersheds provide the water that is a key for thriving communities.

Increasing watershed resiliency and upgrading water system infrastructure to mitigate the effects of climate change is important as NID continues to provide a dependable, sustainable and resilient water supply from source headwater watersheds.

Water can be scooped from NID reservoirs for wildfire suppresion.

use reservoirs to scoop up water and dump on flames. In 2017, when two wildfires began to spread in the early hours of October 9 in both Rough and Ready and off McCourtney Road by the Nevada County Fairgrounds, firefighters scrambled to evacuate neighborhoods and battle rapidly spreading flames in darkness. By morning, the fires were consuming hundreds of acres. Firefighters on the ground had pumps in NID canals as a water source, while helicopters scooped water from ponds and from Lake Wildwood to beat back the flames.

Water supplies are directed to the airport for tanker fire retardant

NID supplies water from its Loma Rica Water Treatment Plant to the Grass Valley Air Attack Base, located at the Nevada County Airport. The water is used to mix retardant dropped by tankers dispatched to fight wildfires regionally and around the state. On average, each year NID pumps about 950,000 gallons of water free of charge as part of its community firefighting support.

This pipeline transports more than half of the water delivered by NID

Vegetation is kept clear under NID's power line

Keeping vegetation and hazard trees away from a primary power line is of utmost importance, and NID's hydroelectric team has literally been walking the line for years during annual inspections and vegetation management efforts to provide a safe clearing. The District's 9-mile long, 60,000-volt Bowman Transmission Line transmits power from the Bowman Powerhouse to the transmission grid controlled by the California ISO, which provides open access to the bulk of the state's wholesale transmission grid.

Fire hydrants protect neighborhoods

NID has installed more than 2,550 water hydrants in neighborhoods throughout its boundaries. The District routinely includes new hydrants as pipelines are upgraded or newly installed and will add hydrants upon fire districts' requests. Interestingly, the pressurized water to a hydrant is supplied by NID's treated water system; it's not the raw water flowing in irrigation ditches.

Focus on efficient water delivery – Combie/Ophir I Canal

Keeping infrastructure intact and functioning is important to efficient water delivery. In spring 2020, NID completed the first phase of a major upgrade to the Combie Canal, which transports more than half of the District's water deliveries from below the Combie Reservoir to customers in southern Nevada and western Placer counties. The District replaced the 50-year-old flume that ran along steep terrain above the Bear River with 96-inch reinforced concrete pressure pipe.

On a Tuesday morning on March 24, 2020, water from Combie Reservoir was gradually introduced to the new 0.84-mile-long pipeline, first entering the massive pipe as a brisk trickle and then a rushing stream.

This infrastructure is the primary water conveyance from Combie Reservoir to southern Nevada and Placer County customers, and serves 3,693 raw water agricultural customers. The system also serves two treatment plants that provide water to 5,022 homes in Lake of the Pines and North Auburn communities. The cost for the project totaled $19.6 million.

Hydroelectric generation powers into the future

Since 1966, as NID's high mountain water has flowed to customers' use, it also has generated clean, renewable hydroelectric power through seven power plants that produce enough electricity to supply more than 60,000 homes. NID has a generation capacity of 82.2 megawatts, and produces an average 375 million kilowatt-hours of energy each year, which it sells to PG&E and the Northern California Power Agency through power purchase agreements.

NID's hydropower operations are a huge win for customers. They provide millions in revenues from power sales to subsidize water rates for the customer, and also cover many of the costs of upper division water storage, conveyance, delivery, maintenance and operations from the headwaters of the Middle and South Yuba rivers, Bear River, Canyon Creek and Deer Creek watersheds through the District's mid-elevation storage reservoirs of Scotts Flat, Rollins and Combie.

Recreation provides outdoor fun and fuels the local economy

Each year, about 200,000 people visit NID recreation areas in search of a relaxing experience for boating, camping, hiking, fishing and swimming. Besides providing some of the most beautiful terrain in the state, NID's reservoirs help support the local economy. For example, a 2019 study showed boating, camping and fishing at Rollins Reservoir provided millions of dollars in spending at nearby businesses and as many as 50 jobs for the region. About 108,000 people – both daytime and overnight visitors – who visited Rollins during summer 2019 spent $4.87 million at convenience and grocery stores, gas stations, restaurants and other nearby businesses in nearby Colfax and Grass Valley, and the Chicago Park community. The Rollins Reservoir recreation area includes Orchard Springs, Long Ravine, Peninsula Resort and the Greenhorn campgrounds. People come from throughout the region to hike and bike on local trails. NID partners with local nonprofits including the Bicyclists of Nevada County (BONC), Youth Bicyclists of Nevada County (YBONC) and the Bear Yuba Land Trust to provide multiuse trails for recreation. The trails NID provides at Scotts Flat Lake and Rollins Lake are some of the most popular in the region. In the coming years, efforts will continue to complete additional trail systems throughout the area.

The first woman to head the District, Jennifer Hanson was named NID's General Manager in June of 2021.

Through the 100 years that NID has provided services in the Sierra foothills, thousands of dedicated employees have left their marks on water history in the region. What started out as a dream to secure irrigation water from upper Sierra Nevada sources for farms and fields has evolved into a multifaceted District that encompasses 287,000 acres, a geographic area that makes the District one of the largest in California. One molecule of water can tumble through 500 miles of canal and 400 miles of pipe, from English Mountain at the 8,373-foot elevation to 150 feet above sea level, south of Lincoln in Placer County. It's an elaborate, complex system that results in more than 3 billion gallons of drinking water each year, as well as irrigation water for 30,000 acres within the District.

As an independent special district operated by and for the people who own land within its boundaries, NID takes pride in it accomplishments, and looks forward to another 100 years of service to live up to its mission to "provide a dependable, quality water supply; continue to be good stewards of the watersheds, while conserving the available resources in our care."

This story of NID is for those founders who began a dream, for those employees who turned that dream to a reality, and for the future leaders who will continue the dream into a legacy.

Thank you!

Appendix 1

Mission Statement

NID Mission Statement:

The District will provide a dependable, safe, sustainable and resilient water supply while being good stewards of the watershed.

Vision Statement:

NID will promote healthy watersheds and reliable infrastructure that support our environment, treated and raw water customers, power reliability and recreation to sustain our quality of life; now and in the future.

Value Statements:

Safety: Safety is integrated into our culture and is the first priority among all aspects of our work.

Fiscal: The District will operate its finances with strong fiscal responsibility and transparency to ensure that NID's finances are spent on those activities that support the mission and vision of the District.

Resources: NID will maintain healthy watersheds through the implementation of best management practices in collaboration with strategic partners.

Customers: NID will make decisions that serve the best interests of District ratepayers.

Employees: NID will maintain and foster a viable workforce through fair compensation packages and a stable work environment.

Decision-making: The District will use the best available science to make informed management decisions. NID will engage collaboratively with staff, the scientific community, agricultural community, and the informed lay communities that its serves. The District also will use generally accepted business practices in planning and project development actions.

Transparency: NID will inform, educate, listen to and collaborate with our communities in our endeavors and activities with honesty and integrity.

Appendix 2

Historical Chronology

1848 On Jan. 24, gold is discovered at Sutter's Mill
1849 Non-native population of California territory grows to 100,000
1850 Construction of California's first large-scale mining canal, the Rough & Ready Ditch, in Nevada City
1853-1857 South Yuba Canal is built
1854 South Yuba Water Company is formed by consolidation of three local water companies. This is the earliest of 520 companies that would eventually consolidate into the Pacific Gas & Electric Company
1869 There are 120 canals in the Nevada County area
1880 Five large reservoirs and 1,000 miles of ditches are operating in Nevada County
1884 Hydraulic mining is outlawed by the Sawyer Decision. Ditch companies turn to water and power
1887 The first California Irrigation Act is established
1897 Irrigation Act is amended, stopping new districts from forming
1900 Six large private water companies operate in Nevada County
1900 Large amount of Nevada County water infrastructure is not in use
1900 Los Angeles looks to Owens Valley, San Francisco to Hetch Hetchy
1917 Nevada County property owners, under the leadership of the Nevada County farm adviser, begin a serious search for a dependable water supply
1918 Yuba-Nevada-Sutter Water and Power Association is formed. (The three-county group disbanded in 1921 after recognition that the irrigation movement was centered in Nevada County)
1919-1921 Committee with Farm Adviser and local farmer M.B. Church files water right applications with the state
1920 New California Irrigation District Act is established
1921 On March 15, petitions carrying 800 signatures of residents favoring the formation of an irrigation district are presented to the Nevada County Board of Supervisors
1921 On Aug. 4, voters support district formation, 636-168
1921 On Aug. 15, NID is established under the Irrigation District Act of 1897
1921 NID's first Board of Directors' meeting is held in Grass Valley's Bret Harte Inn
1921-1926 District organization, engineering studies, bond election, property negotiations, purchase of water systems from private companies, including PG&E
1922 Engineer Fred Tibbetts submits his final engineering report
1922 NID applies to State Bond Commission for authority to issue bonds
1922 NID files for numerous post-1914 water rights
1924 NID enters into an agreement with PG&E to route NID water through PG&E powerhouses. "A new day is dawning for the people of Nevada County. At long last the district is launched."
1925 State Bond Commission authorizes bond election of $7,250,000, and voters approve
1925 On Dec. 3, NID acquires the deed to Bowman Reservoir from Northern Water and Power Company. English Reservoir properties are included
1925 NID purchases the Excelsior Water and Power Company system

Appendix 2 NID Historical Chronology

1926 NID accepts 66,500 acres in Placer County into district boundaries
1926 Construction of the Bowman-Spaulding Canal begins
1926 On Feb. 13, NID acquires French, Sawmill and Faucherie reservoirs from Empire Mines and Investment Company
1926 NID purchases the Tarr Ditch and water rights for $37,500
1926 NID purchases the Parker Reservoir site on the Bear River
1926 Construction projects are under way at Bowman, Milton, Lower Scotts Flat, Combie, Allison Ranch, DS and B canals
1927 NID purchases the Upper Deer Creek system and water rights from PG&E
1927 NID begins to deliver water with its own crews. Water is sold for $2 per acre-foot
1928 NID acquires its first office building on Auburn Street in Grass Valley
1928 Milton-Bowman Conduit is built of redwood staves
1928 Combie Reservoir is built on the Bear River
1928 Aubrey L. Wisker resigns as manager
1929-1947 The Durbrow Years (with William Durbrow as the general manager) featured a tremendous amount of ditch and pipeline construction
1930 District population increases, more water customers
1933 NID purchases PG&E's Gold Hill water system in Placer County
1940 More people are hooking up to NID ditches. Some use ditch water for domestic purposes
1942 The district employs 35-40 people
1943 NID enters into revised agreement with PG&E. The consolidated contract is called "The Marriage Without a Divorce Option"
1947-1956 Management turnover – four general managers in nine years
1947 Financial issues and other district affairs are questioned. NID Water Users Association is formed
1947-1948 A 135-foot-tall dam is built at Scotts Flat. Storage capacity is 27,700 acre-feet. Cost is $1.1 million
1949 NID serves 2,870 customers and has 88 full-time employees
1949 On Oct. 1, the NID Board of Directors invites the community on tour of the mountain division and asks all customers to pay their water bills so NID can pay its expenses
1950 Growth continues in Placer and Nevada counties. More people use ditch water as a domestic source. Demands for chlorination arise. NID injects chlorine into ditches as its first method of water treatment
1950 NID is cash short. A sign at NID front counter says "We only work here, we do not make the rules"
1950 On Feb. 9, NID acquires additional water and ditch rights from the Gold Field Consolidated Mines Company
1952 First discussions with state health officials on chlorination, filtration needs
1953 NID counts 3,361 customers; 2,314 are domestic and business, and 1,047 are raw water
1954 PG&E is interested in power studies
1955 NID serves 3,852 customers
1957 NID Director Vogt and Tax Collector Tobiassen recruit Edwin J. Koster as district manager
1957 The Koster years begin, last through 1968
1957 Koster meets with PG&E to discuss plans for a power project. Origins of NID's Yuba-Bear Project
1958 NID hires Ebasco Services Inc., as engineers, constructors and management consultants
1959 Preliminary engineering studies completed
1957-1958 NID installs first chlorinator on canal
1960 NID serves 4,728 customers
1960s State pushes for more sophisticated water treatment facilities. Farmers, ranchers are hesitant to enter treated water business
1962 Bond issue and refunding plan approved by 97 percent of voters

Appendix 2 NID Historical Chronology

1963 Numerous water right permits obtained from the state through the years are conformed for the Yuba-Bear Project
1963 NID and PG&E receive licenses from Federal Power Commission
1963 NID and PG&E enter into new 50-year consolidated contract
1963 Paul Hardeman, Inc. begins work on the Yuba-Bear Project
1963-66 NID completes the $65 million Yuba-Bear Project, which doubles available water storage
1963 In August, NID purchases a building and yard site on West Main Street
1964 On Sept. 6, the NID office at 144 South Auburn Street burns down
1965 NID serves 6,059 customers
1965 On Dec. 31, the Yuba-Bear Project is declared complete. Ed Koster says, "Without this contract with PG&E for sale of power generated on this project we could not have financed our bonds. As a result, additional water will be available without cost to the landowners of the district"
1966 In February, NID's new office building is complete. Offices had been located in the maintenance department
1966 State mandates NID to develop a master plan for treatment of all domestic water supplies and to provide plans for financing the work
1967 Purchasing Director Don Baker begins collecting historic and antique water meters. These date back to 1890
1967 NID submits its water treatment plan to the state
1969 NID opens the Elizabeth L. George Water Treatment Plant on Banner Mountain with 2,200 customers. The plant is NID's first modern water treatment plant
1970s NID spends $8 million in the transition to treated water service
1970s NID spends millions of dollars on raw water system capital improvements
1970s Debate continues on irrigation water vs. treated water. Agricultural users claim rate discrimination
1970 NID serves 6,622 customers
1971 NID's second modern water treatment plant, the North Auburn Water Treatment Plant opens with 900 customers
1972 In January, NID reports 5,389 customers, plus 1,600 seasonal users
1973 The Snow Mountain Water Treatment Plant is constructed east of Nevada City
1974 The Loma Rica Water Treatment Plant is completed near the Nevada County Air Park
1975-77 Two years of drought present serious water and financial issues
1975 NID serves 8,973 customers
1975 The District employs 135 workers
1976 The District serves 5,800 treated water customers
1976 NID nears completion in completely metering its treated water system
1976-77 A second drought year brings 30.8 inches of precipitation to Bowman Reservoir, 46 percent of average
1977 In May, the NID Board declares a drought emergency, bringing water rationing, drought surcharges
1977 Drought closes Rollins Reservoir
1977 NID investigates cloud-seeding
1978 Former longtime NID legal counsel David Minasian: "Benefits the people within its boundaries can derive from their district will be measured by the extent to which the people within the District cooperate to make it a success"
1978 NID's budget is $5.3 million
1979 In December, NID installs its first computer system. The District contracted for outside computer services since 1965
1970-1980 NID's customer base doubles by 7,602 customers, 100 percent growth
1980-86 NID adds five hydroelectric plants, an answer to the Arab Oil Embargo of 1973-74. Plants added were Rollins in 1980, Combie South and Scotts Flat in 1984, Combie North in 1985 and Bowman in 1986

Appendix 2 NID Historical Chronology

1980 NID's payroll reaches 150 employees
1980 The District is operating 15 water treatment plants
1980 Capacity of the E. George Water Treatment Plant reaches 7.5 million gallons per day
1980 NID Board members are paid $100 per month
1980 NID serves 13,684 customers. The past 10 years have shown the largest growth rate in District history
1980 A historic 22-inch water valve from the famous Idaho-Maryland Mine is installed outside the new modular NID board meeting room
1980 On June 6, a 220-foot section of Combie Canal fails
1981 In January, the board approves a 14.3 percent water rate increase
1981 In October, NID hires first female field (service) worker
1981-82 Bowman Reservoir receives 127.42 inches of precipitation, 189 percent of average, with 389 inches of snow, in the wettest year of the century. The following year, 1982-1983, brought 103.0 inches with 334 inches of snow
1981 NID is serving 9,500 treated water customers
1981 On Aug. 15, NID hosts a dedication of the Albert W. Scurr Memorial, Rollins Power Plant. Al Scurr (1925-1978) worked for NID from 1946-78, rising from laborer to district manager
1981 NID commemorates its 60th anniversary
1981 Division IV Director R. Paul Williams takes office. He becomes the longest serving director in district history
1982 NID has 9,500 domestic and 4,200 raw water customers, nearing 14,000 customers
1982 NID recognizes its 10,000th treated water customer
1982 NID now operates 14 water treatment plants
1982 District hires CH2M Hill to develop a Raw Water Master Plan
1982 NID opens a new purchasing and warehouse Building
1983 NID completes its first intertie with the Placer County Water Agency
1984 NID's budget is $8.05 million
1984 Capacity of the Loma Rica Treatment Plant is expanded from 3.2 million to 8 million gallons per day
1985 In February, NID opens a Placer County customer service office in North Auburn
1985 NID serves 15,814 customers
1985 NID opens the new Scotts Flat Powerhouse
1985 NID takes first place in the first Nevada County Drinking Water Taste Test
1986 Jim Chatigny is promoted to NID manager
1986 NID's budget is $10.4 million
1986 Storms of February 1986 cause $1.7 million damage to NID facilities
1986 Bowman Powerhouse opens
1988 DS Canal Flume No. 1 replaced for $1.7 million
1988 49er Fire rages through western Nevada County, threatens the Lake Wildwood Water Treatment Plant, employees respond
1988 Electronic meter reading comes to NID
1989 West end of the NID office building is expanded
1990 Record snowstorm Feb. 15-17
1990 District boosts minimum irrigation water sale to a half miner's inch
1991 District budget is $18.6 million
1991 District begins a $5 million upgrade at the E. George Water Treatment Plant
1991 NID receives licenses for nine historic water rights (in process since 1968)
1992 Over the past three years, seven improvement districts have been formed, supplying treated water to more than 250 homes
1993 NID's customer total passes the 20,000 mark

Appendix 2 NID Historical Chronology

1993 On April14, the NID Board goes on record in opposition to Wild and Scenic River designation for the South Yuba River

1994 On May 4, NID takes first place in the third Nevada County Drinking Water Taste Test, a friendly competition between six Nevada County water suppliers

1995 The district budget is $18.3 million

1995 On Sept. 13, NID recognizes its 15,000th treated water customer

1996 Over the past 10 years, NID has obtained $10.8 million in California Safe Drinking Water Bond Act funding to form 15 water quality improvement districts, bringing treated drinking water to an additional 579 parcels

1996 NID's budget is $17.2 million

1996 NID serves 21,190 customers

1996 NID closes the aging Penn Valley Water Treatment Plant and connects the area to the newer Lake Wildwood system

1996 NID celebrates its 75th anniversary (Aug. 15) and builds a historic Pelton Wheel exhibit at the Nevada County Fairgrounds

1997 On July 9, the NID Board meets at Bowman Reservoir, the first ever meeting in the mountain division

1998 District budget is $29.2 million

1998 NID office east end expansion (two-story, 7,200 square foot) is completed for $900,000

1998 NID bottles some of its drinking water. It is a good community relations tool for a few years but is discontinued over concerns for plastic use. Water was shipped to Modesto from 1998-2002 where about 200 cases were bottled each year

1998 NID begins studies of treated water service to the Lincoln area. A large Del Webb project (Sun City Lincoln Hills) is in planning

1999 NID is now serving 10 golf courses: Orchard and Hills at Del Webb, Darkhorse, Nevada County CC, Alta Sierra, Quail Valley, Lake Wildwood, Lake of the Pines, Auburn Valley and Turkey Creek

2000 NID goes live with its first website

2000 The District budget is $31.8 million

2000 Replacement begins on six miles of the aging Cascade Bench Flume above Scotts Flat Reservoir, estimated at $16 million to $18 million. The District adds nearly 7 miles of 54-inch reinforced concrete pipeline. Water is pumped from temporary barge on Lower Scotts Lake during work in late 2000

2001 Planning begins for Lower Cascade Canal replacement. Together the upper and lower Cascade jobs would represent the District's largest construction effort in more than 30 years. The 1,100-page EIR would be completed in 2006. The canal would be completed six years later, in 2012, for a total $41 million. The work includes 6.4 miles of large diameter pipeline, 5.5 miles of treated water lines and numerous fire hydrants

2001 NID has 22,000 customers, 160 employees

2001 District budget is $38.5 million

2001 NID welcomes Deer Creek Park, 243 customers into the public water system. It is a former private system operated by the homeowners

2002 NID plans $7 million upgrade of the Lake of the Pines water system (It was completed in 2004)

2002 Jim Chatigny retires in September, having served as general manager since 1986

2002 Ron Nelson joins NID as general manager (retires in Sept. 2012)

2005 NID begins a lengthy federal relicensing process for its Yuba-Bear Hydroelectric Project. The original license expires in 2013

2005 NID installs its first solar energy, 552 panels in 3 arrays at the North Auburn Water Treatment Plant. NID paid half with matching PG&E grant. The total project cost was $538,000

2006 Replacement begins on the last eight of 32 original wood frame metal flumes on the DS Canal near Nevada City

Appendix 2 NID Historical Chronology

2006 NID begins to operate under the new state Proposition 218, which governs the rate setting process

2006 NID begins work on an innovative Mercury Remediation Project. First demonstrations above Combie Reservoir in 2009, with more in 2013

2008 Major expansion begins at the E. George Water Treatment Plant, NID's largest. The $14.8 million job will increase plant capacity from 10 million to 18 million gallons per day. Work is completed in 2009

2008 NID and property owners at Cement Hill near Nevada City team up to create a community facilities district and supply water to 241 parcels

2009 The 49 Fire sweeps through North Auburn and NID's North Auburn Water Treatment Plant, sparing the plant but destroying a historic 1885 stamp mill on display there

2010 NID's budget is $60.7 million

2011 NID's budget is $72.8 million

2010-2011 Becomes NID's fifth wettest year on record

2013 In February, Remleh Scherzinger joins NID as general manager

2014 NID leaders begin to revisit a water storage concept that dates to 1926. A potential reservoir site, located on what was then the Parker Ranch along the Bear River between what are now Rollins and Combie reservoirs. The new proposal is called Centennial Water Storage Project

2014 The board declares a Stage II Drought and asks for 10-15 percent water use reductions. By the summer, the request is increased to a 20 percent cutback

2015 Drought is the big story. On April 1, 2015, the governor calls for a 25 percent statewide water use reduction. The State Water Board later mandated NID to reduce its use by 35 percent

2016 NID establishes environmental resources efforts to address climate change. Grants fund work to thin trees and vegetation on hundreds of acres

2018 A University of California, Los Angeles (UCLA) study finds that in the Sierra Nevada foothills climate change will raise temperatures between 5 and 7 degrees by the end of the century if carbon emissions are not significantly reduced

2019 An NID study shows boating, camping and fishing at Rollins Reservoir provides millions of dollars in spending at nearby businesses and as many as 50 jobs for the region. About 108,000 people – both daytime and overnight visitors – who visited Rollins during summer 2019 spent $4.87 million at convenience and grocery stores, gas stations, restaurants and other nearby businesses

2020 NID completes the first phase of a major upgrade to the Combie Canal, which transports more than half of the District's water deliveries from below the Combie Reservoir to customers in southern Nevada and western Placer counties

2020 During the Covid-19 pandemic, the District kept the water running and re-invented many of its business processes to keep employees and customers safe

2020 The General Election resulted in NID's first-ever majority of women on the Board of Directors. Three women were elected to serve on the five-member Board

2021 NID completes the vital Combie Phase 1 Canal and Bear River Siphon Project

2021 In June, Jennifer Hanson joins NID as its General Manager

Appendix 3

Directors

Munson B. Church	1921 – 1927
Willis Green	1921 – 1927
Guy N. Robinson	1921 – 1929
William G. Ullrich	1921 – 1937
Theodore Schwartz	1921 – 1947
J. A. Teagarden	1928 – 1933
Thomas Mulcahy	1928 – 1949
A. Isaak	1930 – 1937
Alexander Buck	1934 – 1935
William Jaeckle	1937 – 1941
F. H. Newcomb	1938 – 1938
L. P. Singer	1938 – 1943
J. B. Francis	1939 – 1947
H. E. Wheeler	1942 – 1949
Edgar E. Burnet	1944 – 1949
J. H. Gleason	1948 – 1951
G. O. Griffith	1948 – 1951
Max P. Arnold	1950 – 1953
Herbert J. Nile	1950 – 1953
Frank A. McGinley	1952
Robert Amlin	1953
E. B. Power	1950 – 1961
William G. Vogt	1951 – 1960
Philip L. Personeni	1953 – 1957
Carl J. Rolph	1953 – 1957
C. B. Winkler	1953 – 1959
L. D. Huntley	1957 – 1965
Ross C. McBurney	1957 – 1969
Warren S. Wilson	1959 – 1965
Melvin A. Brown	1960 – 1972
Vernon D. Vineyard	1961 – 1978
C. Bruce McDonald	1965 – 1973
Alex Ferreira	1966 – 1971
James A. McAdams	1970 – 1978
Alphonso W. Arden	1971 – 1972
Francis L. Dobbas	1972 – 1980
John Henry Callender	1973 – 1974
Eugene Walter, Jr.	1973 – 1976
Dennis H. Hunyada	1974 – 1976
Victor Beisswinger	1976 – 1979
Albert Butterfield, Jr.	1977 – 1978
Ernst Bierwagen	1978 – 2002
William P. Jensen	1979 – 1982
Carole Friedrich	1979 – 1985
Eddie Ferreira	1980 – 1984
Charles E. Zahn, Jr.	1980 – 1984
R. Paul Williams	1981 – 2009
Victor Beisswinger	1985 – 1992
Robert S. Pierce	1985 – 1992
David E. Southern	1985 – 1998
Dale H. Birdsall	1992 – 1999
George V. Leipzig	1992 – 2008
Nancy Weber	1998 – 2018
Peter Arnold	1999 – 2000
W. Scott Miller, M.D.	2000 – 2020
John Drew	2002 – 2018
John A. Norton (Interim)	2008
Nick Wilcox	2008 – 2020
Jim Bachman	2009 – 2015
Will Morebeck	2015 – 2018
Chris Bierwagen	2018 – current
Ricki Heck	2018 – current
Laura Peters	2018 – current
Karen Hull	2020 – current
Rich Johansen	2020 – current

Appendix 4

General Managers

Aubrey L. Wisker
1921 – 1928

Fred Miller
1928 – 1929

William Durbrow
1929 – 1947

Forrest F. Varney
1947 – 1950

Charles T. Law
1951 – 1952

August E. Kuiper
1952 – 1954

T.D. Sawyer
1955 – 1957

Edwin Koster
1957 – 1968

Frank Clendenen
1968 – 1971

Albert W. Scurr
1971 – 1977

Frederick G. Bandy
1977 – 1986

James Chatigny
1986 – 2002

Ron Nelson
2002 – 2012

Remleh "Rem" Scherzinger
2012 – 2020

Jennifer Hanson
2021 – Current

Appendix 5 Water Canal Systems

Cascade System
Cascade
Cascade Pipe
Snow Mountain
Willow Valley
Cement Hill
Lake Vera Pipe
Sugar Loaf Res/Pipe
Red Hill
Red Hill Res/Pipe
Buffington
Upper G.V.
Chicago Park
Sunshine Valley
Sontag
Ripkin
Russ Reservoir
Chicago Park East
Chicago Park West
Meyer Beirwagen Pipe
Smith Moulton
Blum Pipe
John Henry Meyer
Rattlesnake
Woodpecker
Forest Springs
Maben
Maben Res/Pipe
Kyler
Grove
Cherry Creek
O'Leary Pipe

Deer Creek South
D.S.
Red Dog
Lower G.V.
Allison Ranch
Corey
Lafayette
Rough & Ready
Wolf Creek Nat.
Tarr
Breckenridge
Clear Creek
Beyers
Smith Gordon
Casey Loney
Stinson Pipe
Pet Hill
Pet Hill Ext.
Bald Hill
B Canal
Cole Viet
Miller
Wolf
Pearl Barnes
Carpenter
Cole

Deer Creek North
Deer Creek Nat.
Newtown
Lester
Tunnel
Riffle Box
Tunnel Ext.
Rex Canal
Portuguese
Quincy
Quincy Pipe
Squirrel Creek Nat.
China Union
Spenceville
Meade
Ousley Bar
Town
Farm
Smartsville Irrig.
Keystone
Combie Phase I
Magnolia III
Magnolia III Ext.
Combie Phase II&III
Magnolia I
Weeks
Mag. II South
Mag. II North
Markwell
Wolf Hannaman
Sanford Struckman

Combie Ophir
Combie Ophir I
Lone Star
Rudd
Rainey
Oest
Willets
Orr Creek Nat.
Gold Hill I
Camp Far West
Lateral V
Lateral IV
Lateral II
Lateral I
Wiswell Gladding
Church
Forbes
Renken
Bogdanoff
Camp Far West Ext.
Combie Ophir II
Picket
Beck
Picket North
Picket South
Rock Creek Bypass
Combie Ophir III
Columbia East
Columbia West
Combie Ophir IV
Vernon
Rohr-Shanley
Herkomer Pipe
Dudley
Gold Blossom
St. Patricks
Little Ophir
Hymas
Gold Hill II
Deadman's Ravine
Whiskey Diggins
Old Whiskey Diggins
Valley View
Kilaga Springs
Nicklas
Livingston
Rielli
Iron Canyon
Thomas
Stringham
Files

Fiddler Green
Fiddler Green
Ophir
Kemper
East Kemper
West Kemper
Bean Cullers
Edgewood Pipe
Edgewood Canal

Auburn Ravine
Auburn Ravine Nat.
Auburn Ravine I
Chevallier Pipe
Auburn Ravine II
Lincoln
Musser
Markell
Fruitvale
Sohier-Ahart
Hayt
Doty
Doty Natural
Doty South
Doty North
Comstock Gladding
Clark Jorstad
Hemphill

Appendix 6 Water Treatment Plants

Plant Capacity (million gallons per day)

Loma Rica 8.3
North Auburn 6.0
Elizabeth George 18.0
Lake of the Pines 5.0
Lake Wildwood 4.0
Cascade Shores 0.34

NID's treated water service areas are located in and around Grass Valley and Nevada City, Banner Mountain, the Glenbrook Basin, Loma Rica, Alta Sierra, Lake of the Pines, Penn Valley, Lake Wildwood and North Auburn. A smaller plant is located in Smartsville.

Generally, treated water is available in the more populated areas. It can be very expensive to extend treated water main lines into rural areas where there are fewer customers to share the costs. In recent years, the District has been successful in working with local property owners to form local water quality improvement districts.

The transition to treated drinking water began in the late 1960s and early 1970s when NID constructed its first water treatment plants. Today, the District operates a network of six modern water treatment plants in Nevada and Placer counties and a small seventh plant that serves the Smartsville community in the Yuba County foothills.

NID presently produces about 3 billion gallons — approximately 9,000 acre-feet — of treated drinking water per year. The District's treatment plants are operated by state-licensed and certified technicians. Water treatment processes include chlorination, coagulation, flocculation, sedimentation and filtration.

The District operates a state-certified water laboratory where water samples from throughout the District are tested regularly.

NID treated water meets and exceeds standards set by the California Department of Public Health. As required by state law, NID produces an annual water quality report, the Consumer Confidence Report, that is posted on the District's website.

Appendix 7 Hydroelectric Power Plants

NID Power Plants (Capacity/megawatts)
Chicago Park 39.0
Dutch Flat 24.57
Rollins 12.15
Bowman 3.6
Combie South 1.5
Scotts Flat 0.85
Combie North 0.5
Total: 82.2 megawatts

NID has seven power plants that generate enough electricity to supply the equivalent of more than 60,000 homes.

The District is a leader among Northern California water agencies in the production of clean, hydroelectric energy. Revenues from hydroelectricity are very important in the maintenance and operation of NID's extensive water distribution system.

NID has a generation capacity of 82.2 megawatts, produces an average 375 million kilowatt-hours of energy each year, and sells its electrical output to the Pacific Gas & Electric Co.

To make use of existing water releases, small power plants were added during the 1980s at Bowman, Scotts Flat and Combie reservoirs.

NID is completing requirements for a new federal license that will govern the Yuba-Bear Project hydroelectric operations for years to come. The District has secured a new power sales agreement that markets the Project's energy production to the Pacific Gas & Electric Company.

Appendix 8 Reservoir Recreation Facilities

NID provides outstanding outdoor recreational opportunities at district reservoirs in the foothills and mountains of the Northern Sierra.

Foothill Recreation
Camping, fishing, swimming, sunning, boating, water skiing, sailing, kayaking and other activities are popular at both Rollins and Scotts Flat reservoirs in the Sierra foothills.

Scotts Flat
Scotts Flat is situated among the tall pines at the 3,100-foot elevation nine miles east of Nevada City via Highway 20 and Scotts Flat Road. It offers 169 campsites at two large campgrounds, plus a group camp. Across the lake, accessible via Red Dog and Quaker Hill roads from Nevada City, is the Cascade Shores Day Use Area.

Rollins
Rollins, located at the 2,100-foot elevation off Highway 174 between Grass Valley and Colfax, has four independently operated campgrounds. Long Ravine, Greenhorn, Orchard Springs and Peninsula offer a combined 250 campsites and a complete range of services including stores, restaurants, fuel sales and rentals.

User fees at the public recreation areas are set by the NID Board of Directors and must be approved by the state departments of Water Resources and Fish & Wildlife.

Mountain Campgrounds
In the mountains, NID maintains and operates campgrounds and recreational facilities in the Jackson Meadows – Bowman Lake areas. Jackson Meadows features several campgrounds, picnic day-use sites and boat ramps. Other campgrounds are located at Bowman, Canyon Creek, Sawmill and Faucherie Lakes in the Bowman corridor.

The primary recreation season in the high mountain areas generally runs from Memorial Day through Labor Day, depending on weather.

NID

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