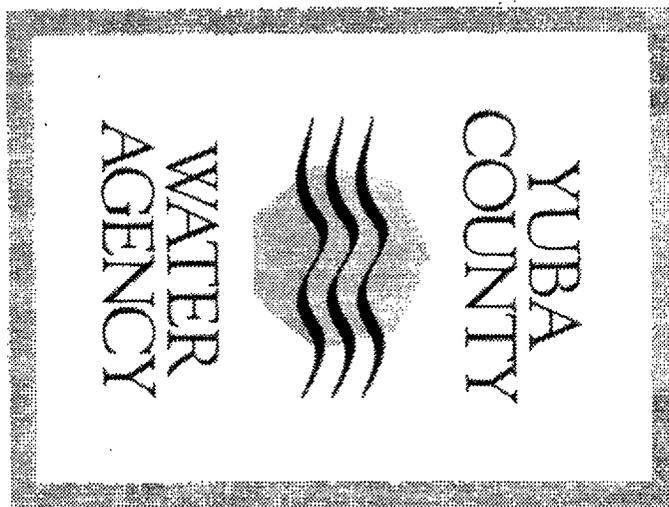




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YUBA COUNTY WATER... 24 of the... Water Code Appe

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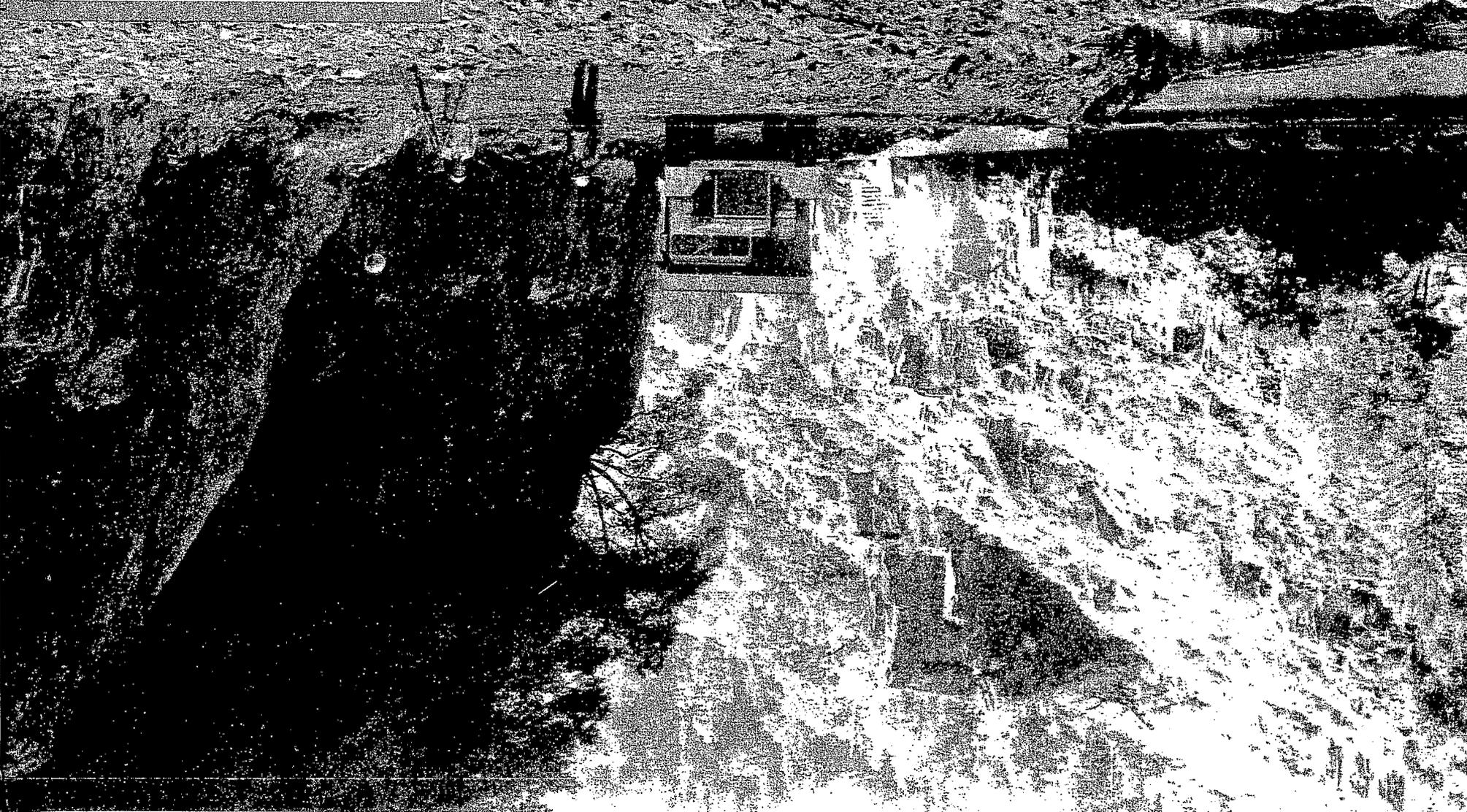
useful purp... the agency shall... Water Agency... A district... Water Agency... the agency shall... Water Agency... A district... Water Agency... the agency shall... Water Agency... A district...

E-017169

New Bullards Bar Dam site at start of construction.

blessed with golden riches and great natural beauty, rises at the crest of the Sierra Nevada some 8,000 feet above the Pacific Ocean and tumbles through a hundred miles of canyons in just 48 hours to join the Feather River at a confluence that stands only 67 feet above sea level.

THE YUBA RIVER.



E-017170

E-017170

It drains 1,357 square miles of a watershed never more than 35 miles wide.

Peaceful Indians harvested grapes among its willows and cottonwoods when Jedediah Smith guided the first party of white settlers into Northern California in 1828. It took on the name Yuba in 1844, either derived from the Spanish word "uvas" for grapes or the Indian tribal name "Juba," depending on whether you believe Gen. Mariano Vallejo or Capt. John Sutter.

From the days of Jonas Spect, a prospector who hit pay dirt in the river in the summer of 1848, it produced the greatest lode of gold of any stream in the United States.

By the turn of the century panning was no longer profitable, placer mining had displaced the prospector and silt was clogging the channel from Smartville to Marysville. Even as the gold hunt flourished, enterprising men created farms on the fertile valley floor and were tapping the Yuba for an even richer lode of irrigation water to flood their fields and streams.

As early as 1875, levees were rising to protect against the winter flow in farm country and Marysville was beginning to surround itself with dikes that now stand 35 feet above its urban streets.

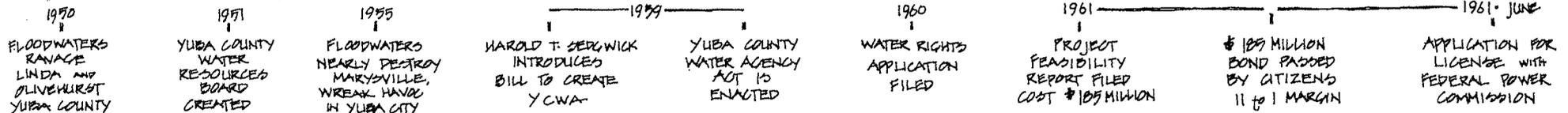
Old Bullards Bar dam was built between 1922 and 1924 by the Yuba River Power Company and, downstream, the Federal Government created, just prior to World War II, the debris dam at the Narrows and Englebright Reservoir.

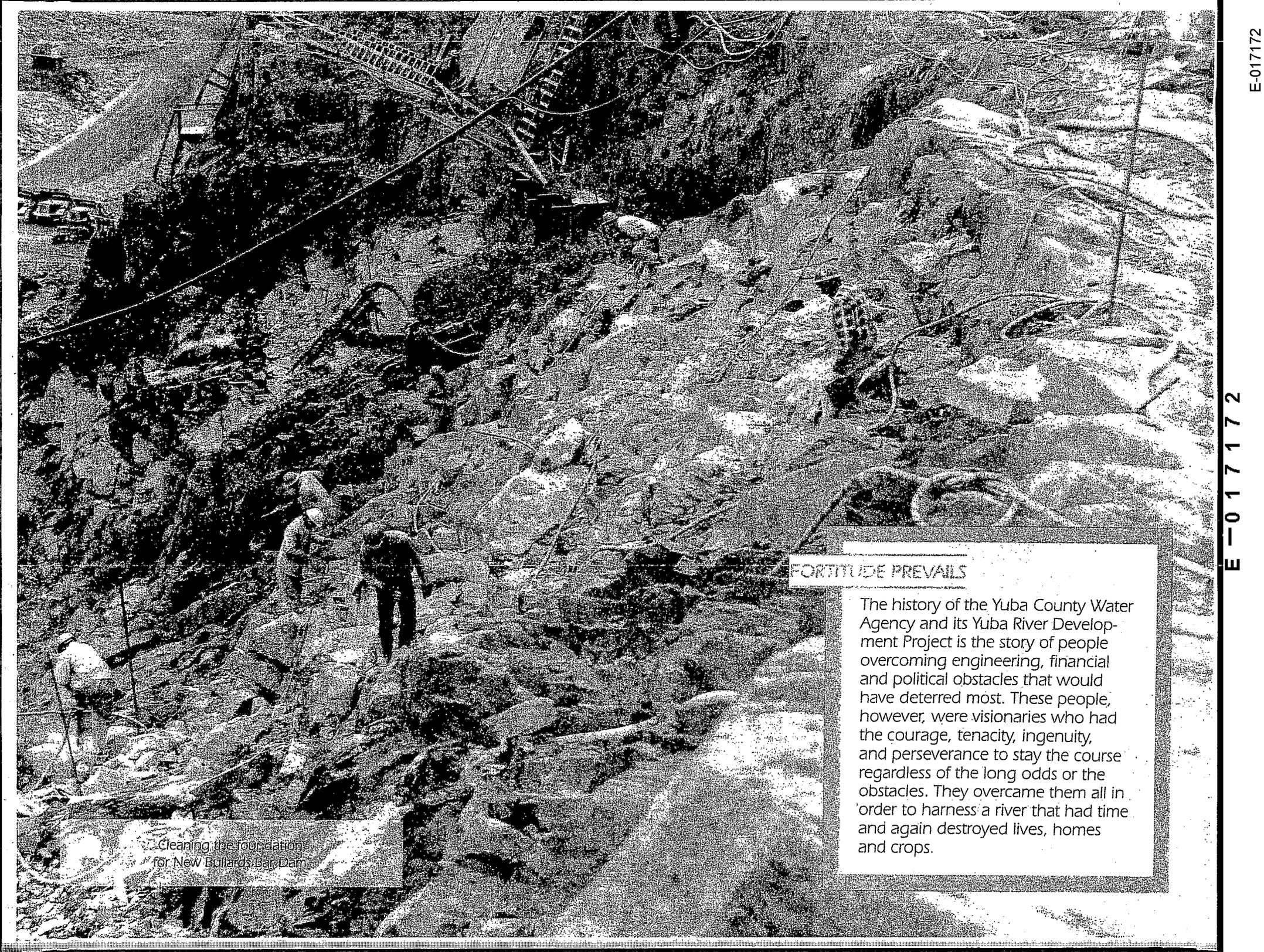
But even the checking of the river mining debris and the erection of small dams did little to safeguard against the terrible temper of the Yuba River in full flow.

There have been ten major floods on the Yuba during this century. In 1950 the Yuba cut through its banks at Hammonton and inundated southern Yuba County, causing millions of dollars in damage.

Then in 1955 as every watershed in California was hit by tropical storms, the Yuba became a ravaging torrent that choked its mountain channel, poured over the dams at Bullards Bar and Englebright Reservoir and ripped into the valley.

The 1955 Yuba River flood came within inches of flooding Marysville, wreaked havoc in Yuba City, killed 40 people, forced almost 30,000 people to flee the county, and reinforced the contention that there was an urgent need for a major water program.





Cleaning the foundation
for New Bullards Bar Dam

FORTITUDE PREVAILS

The history of the Yuba County Water Agency and its Yuba River Development Project is the story of people overcoming engineering, financial and political obstacles that would have deterred most. These people, however, were visionaries who had the courage, tenacity, ingenuity, and perseverance to stay the course regardless of the long odds or the obstacles. They overcame them all in order to harness a river that had time and again destroyed lives, homes and crops.

For over 100 years, the people of Yuba and Sutter counties had braced for battle against the rivers which provided them with the essence of their agricultural economy but which also in high water years loomed as enemies that would destroy their industry, wipe out their homes and take their lives.

Before the great flood of 1955, the state had started planning its California Water Project which would build Oroville Dam on the Feather River. But there was no project in State or Federal planning that would control the Yuba River.

Since the wake of the 1950 flood that had raced through Linda and Olivehurst, south of the Yuba River, there had been men at work in Yuba County on a water program that would control the Yuba River against disastrous floods and develop water resources for farmers who were pushing their wells ever deeper into dwindling underground reservoirs. The population of Yuba County, and Sutter County as well, had been growing steadily since World War II and the flood of 1950 had emphasized the danger to lives as more suburban home sites developed.

Led by Harold J. Sperbeck, the Yuba County Board of Supervisors created in December 1951 the Yuba County Water Resources Board.

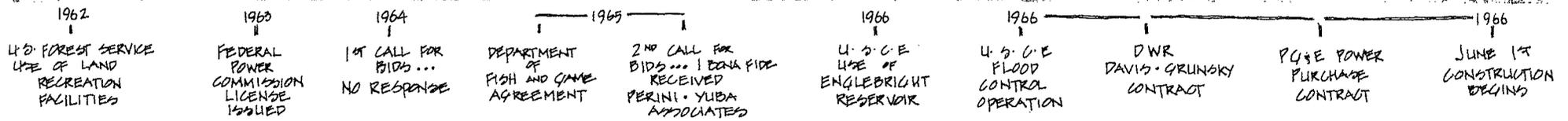
The board had been able to do little more than evolve preliminary plans, locate water rights and help the component water districts until after the 1955 flood.

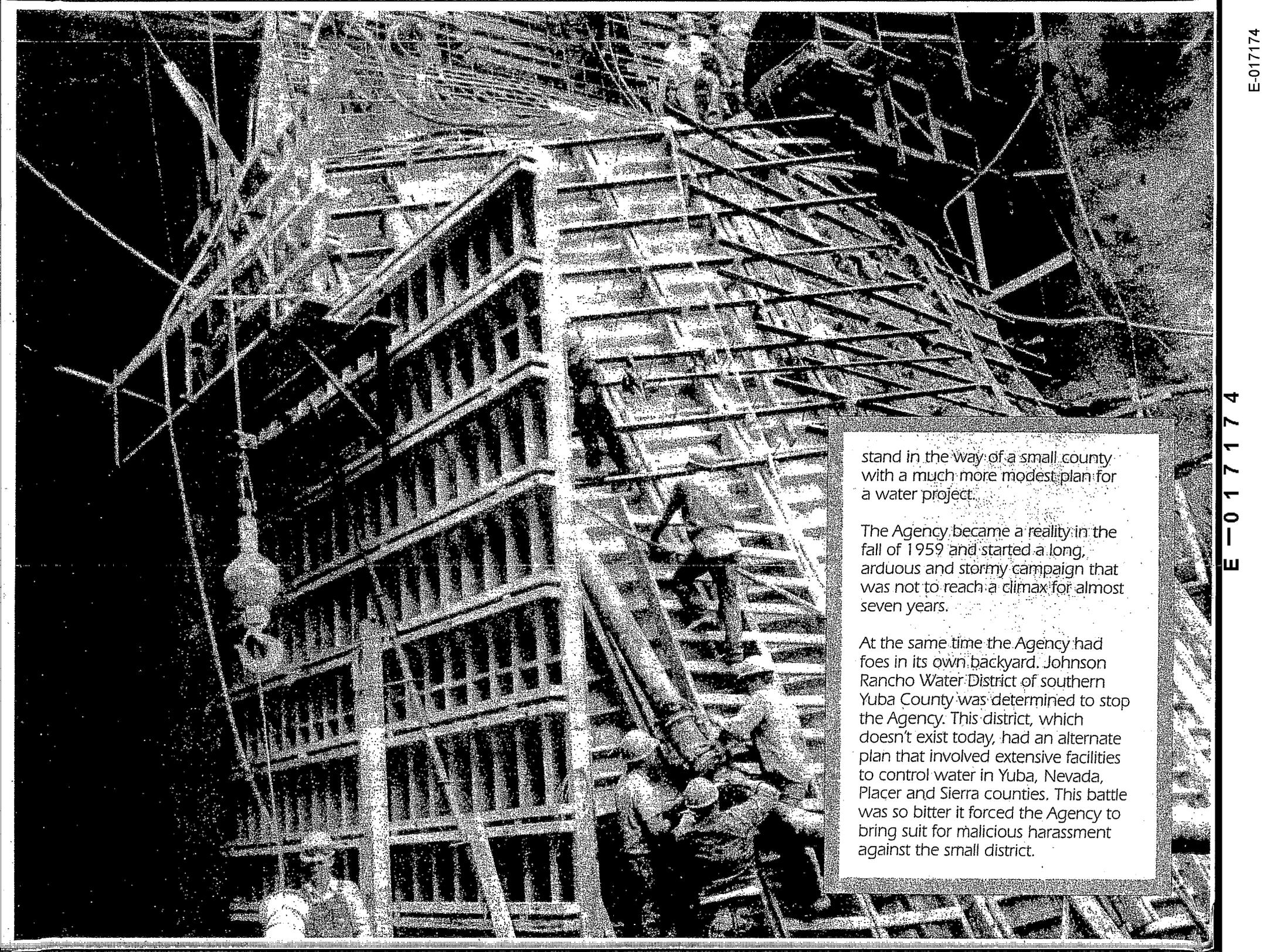
The first problem that had to be resolved was the creation of an effective water agency that could take firm action to develop the Yuba River Project. Over a three-year period, a community battle raged over how to create an agency and how it should be governed.

In January of 1959, Yuba County went to the State Legislature through Assemblyman Harold T. Sedgwick, with a bill to create a water agency, which was almost lost in committee.

Then it was debated on the Assembly floor for longer than the state bond bill authorizing Governor Brown's big dream—the California Water Project. A similar battle took place in the Senate, and lobbying against the bill went on in the governor's office right up until the time Brown signed it on June 1, 1959.

No one in Yuba County realized it at the time, but the election of Edmund G. (Pat) Brown as governor of California in 1958 probably helped the county get its water agency approved. Brown brought to the governor's office a near religious fervor about building the massive state water project. With such grandiose plans in mind Brown could hardly





stand in the way of a small county with a much more modest plan for a water project.

The Agency became a reality in the fall of 1959 and started a long, arduous and stormy campaign that was not to reach a climax for almost seven years.

At the same time the Agency had foes in its own backyard. Johnson Rancho Water District of southern Yuba County was determined to stop the Agency. This district, which doesn't exist today, had an alternate plan that involved extensive facilities to control water in Yuba, Nevada, Placer and Sierra counties. This battle was so bitter it forced the Agency to bring suit for malicious harassment against the small district.

The Agency employed International Engineering Co. of San Francisco, one of the leading engineering firms in the world, to make a feasibility study and, in January of 1961, they filed a report outlining Yuba River development that would cost approximately \$185 million.

Key concepts of the Project were: development of sufficient hydroelectric power to repay bond financing, without any tax obligation on the part of local landowners; and a long term contract for sale of power to Pacific Gas & Electric Co. at a guaranteed annual payment, which would be the sole security for the bond issue. In addition, some help was sought for a Federal contribution in recognition of Project flood control accomplishments, and a state contribution in recognition of statewide benefits to recreation and fish enhancement.

Even so, the project posed a financial chore beyond all other obstacles that would have tried the resources of a state government, no less that of a county which was rich in history but short on financial assets.

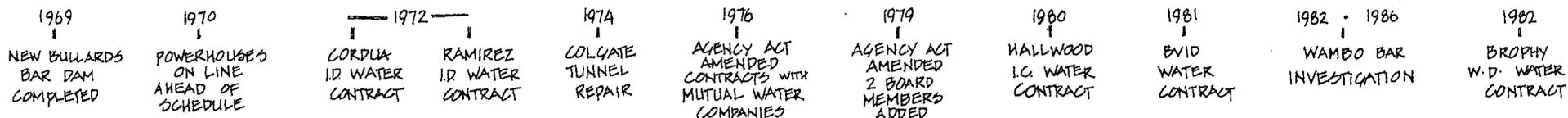
In fact, at this point in its history, the Agency had exhausted its funds. It had committed several years of tax revenues to a loan from the county general fund that was needed to pay engineering costs.

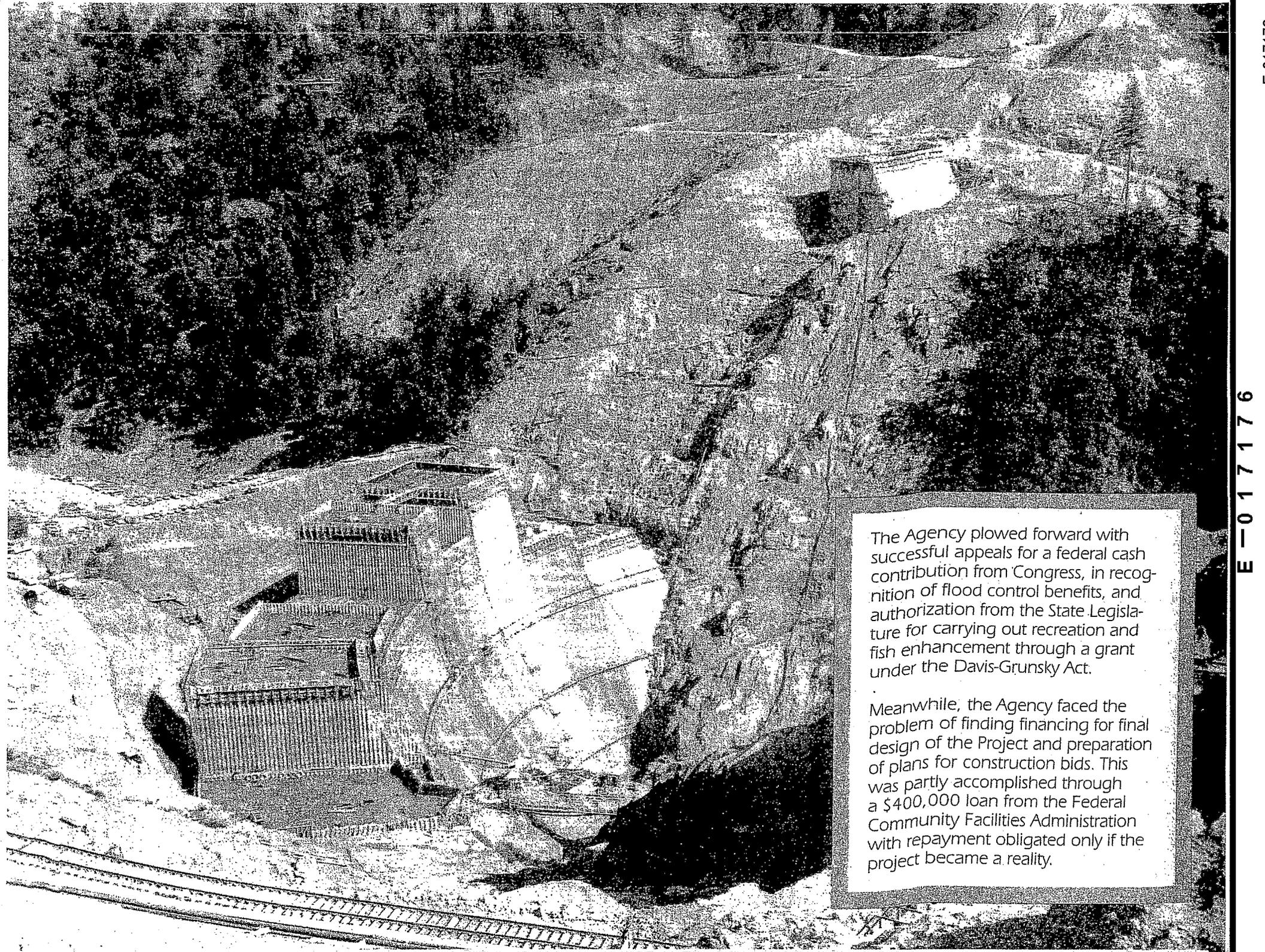
Few people in local, state or federal water bureaus believed that Yuba, one of the state's smaller counties with an assessed valuation of only \$65 million, could develop a project that carried a price tag of almost \$200 million.

Once again, the Agency proved everyone wrong.

When the ballots were counted on May 16, 1961, Yuba County voters had approved, by an 11-1 margin, the \$185 million in revenue bonds needed to fund the project. This was almost three times the total county assessment at that time. Still the Agency faced some complex political maneuvers that had to be carried out despite its lack of political muscle at either the state or federal level.

The Federal Power Commission required a construction license. This license required: an agreement with the U. S. Forest Service, which controls Plumas and Tahoe Forests on the Yuba watershed to insure protection of the forest lands; a recreation plan acceptable to the Forest Service; a Fire Control Plan; a negotiated agreement with the California Department of Fish and Game that would provide fish protection and enhancement, and an agreement with the U. S. Bureau of Reclamation and the State of California for future downstream development.





The Agency plowed forward with successful appeals for a federal cash contribution from Congress, in recognition of flood control benefits, and authorization from the State Legislature for carrying out recreation and fish enhancement through a grant under the Davis-Grunsky Act.

Meanwhile, the Agency faced the problem of finding financing for final design of the Project and preparation of plans for construction bids. This was partly accomplished through a \$400,000 loan from the Federal Community Facilities Administration with repayment obligated only if the project became a reality.

Finally, there were the complicated negotiations with Pacific Gas & Electric Co. for a 50-year contract for the sale of power that would finance the revenue bonds and to acquire the existing power generating plants that PG&E had long been operating at the old Bullards Bar Dam and downstream at Colgate.

Final designs were prepared and by the summer of 1964 the Agency could look at the framework of its Project.

A decision was made to call for bids to get construction under way before a lethargic bond market and a depression in the price of power put it out of business.

The bid opening in September of 1964 elicited considerable interest on the part of several contractors, but in the end they declined to bid—"too many contingencies and not enough money" was the consensus.

After an agonizing reappraisal by the Agency and its engineers, a revised plan was developed to produce more power, more efficiently by eliminating the proposed New Bullards Bar Power Plant and by replacing the old PG&E Colgate Power Plant and tunnel with larger facilities. To save additional money the irrigation diversion dam and canals, the New Narrows afterbay, and other project amenities were eliminated. Irrigation diversions and the

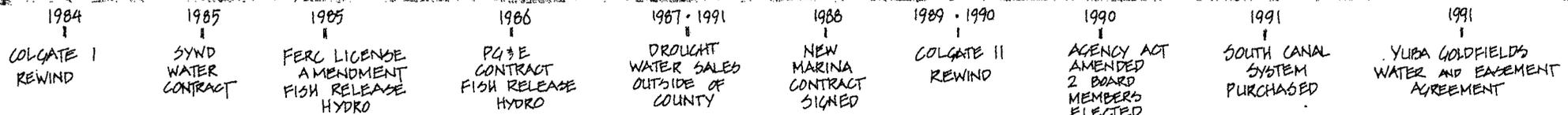
canals would be left for a later stage of construction.

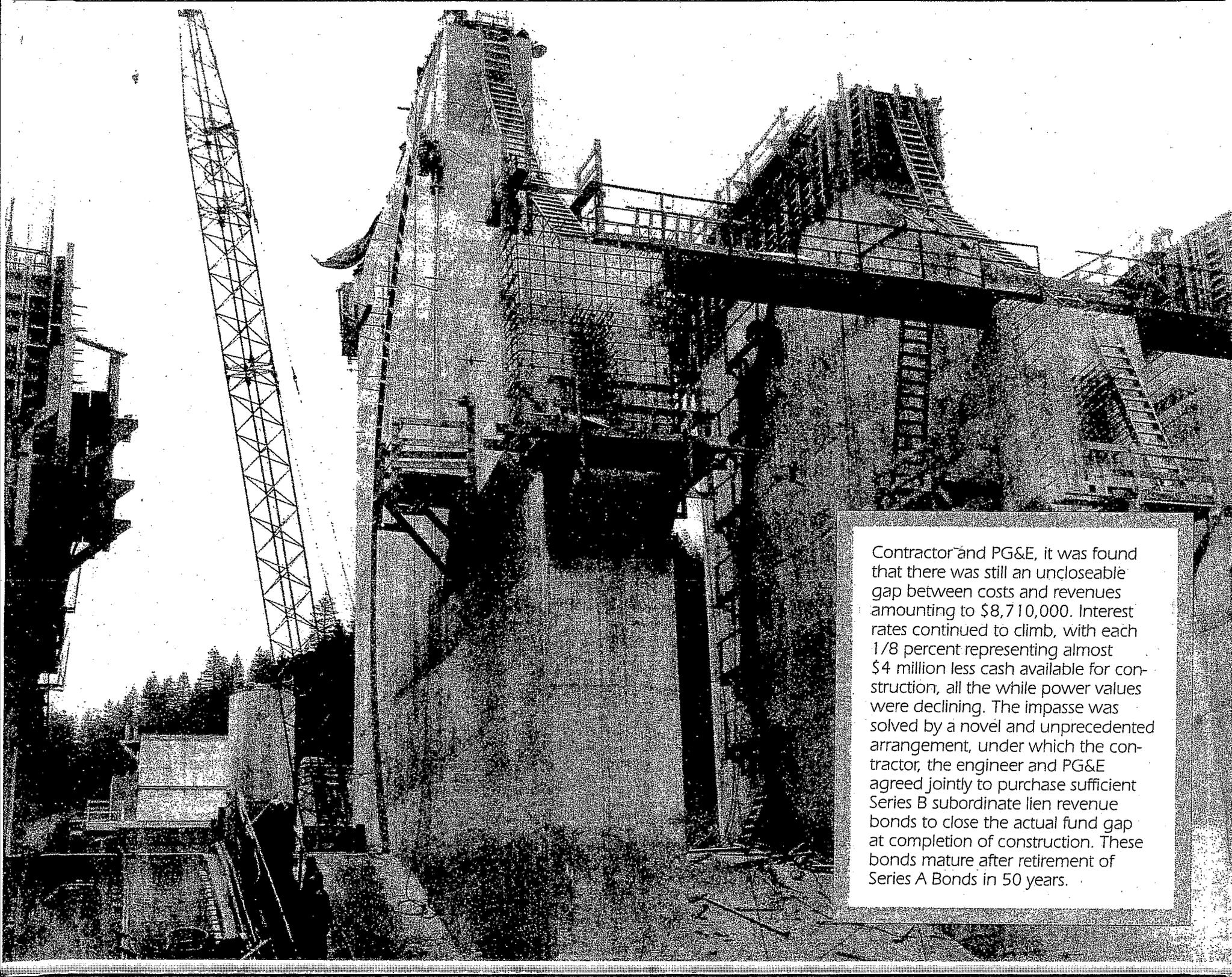
Bids were called for again, in December of 1965, and this time all the necessary contracts, licenses and permits were accomplished facts. Costs had continued to climb sharply since the fall of 1964 and power values continued to fall and, shortly before the bid date, the bond market interest rates rose more than one percent. The Agency received two sealed packages in response to its invitation for bids. One was not a bid, but a substitute proposal for a negotiated cost plus "target estimate" contract.

The other was a bona fide bid, some \$26,000,000 higher than the estimated funds available, from a contracting combine called Perini-Yuba Associates.

Upon finding that the bidding contractor was willing to negotiate a contract, Agency officials obtained the cooperation of the Governor in a special call to the Legislature and, as interest rates continued to climb, were granted legislative authority to execute a negotiated contract with the bidder for the largest single public works contract ever awarded in California.

After intensive negotiation, involving concessions on the part of the Agency, as well as the





Contractor and PG&E, it was found that there was still an unclosable gap between costs and revenues amounting to \$8,710,000. Interest rates continued to climb, with each 1/8 percent representing almost \$4 million less cash available for construction, all the while power values were declining. The impasse was solved by a novel and unprecedented arrangement, under which the contractor, the engineer and PG&E agreed jointly to purchase sufficient Series B subordinate lien revenue bonds to close the actual fund gap at completion of construction. These bonds mature after retirement of Series A Bonds in 50 years.

The Series A Bonds were sold to a single bidder May 24, 1966—Blyth & Co. and Smith-Barney Inc. of San Francisco. It appears in retrospect that there were only a very few days when market conditions were such that this issue could have been absorbed. On June 1, 1966, the money and bonds were delivered, and a unique construction project was under way.

BUILDING A PROJECT

The construction was undertaken by Perini-Yuba Associates. They would hire up to 3,000 workers, hailing from every state in the United States. A score of local firms including H. Earl Parker, Baldwin Contracting Co. and Tenco made major contributions to the development.

The task before them was monumental and the time line was set by the contract, which stated "the project must be completed and operational four years and one month from the starting date".

The challenges lay in the geography of the land where the construction was to take place—steep, rocky canyons accessible only by narrow roads located miles from any large city—and weather in the form of torrential rains that could wipe out months of excavation work in a few hours. Both could cause delays, which no one could afford.

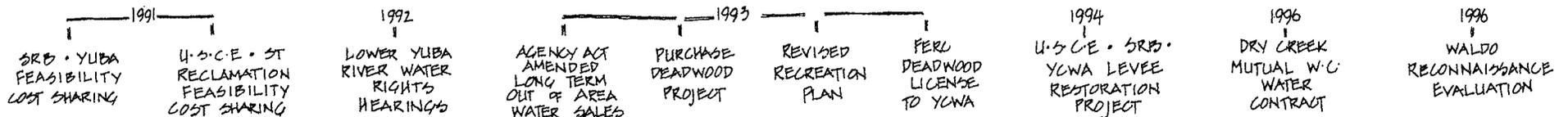
The Agency and the contractor knew that lives, homes and businesses would be lost if the project wasn't completed before the Yuba rose up again.

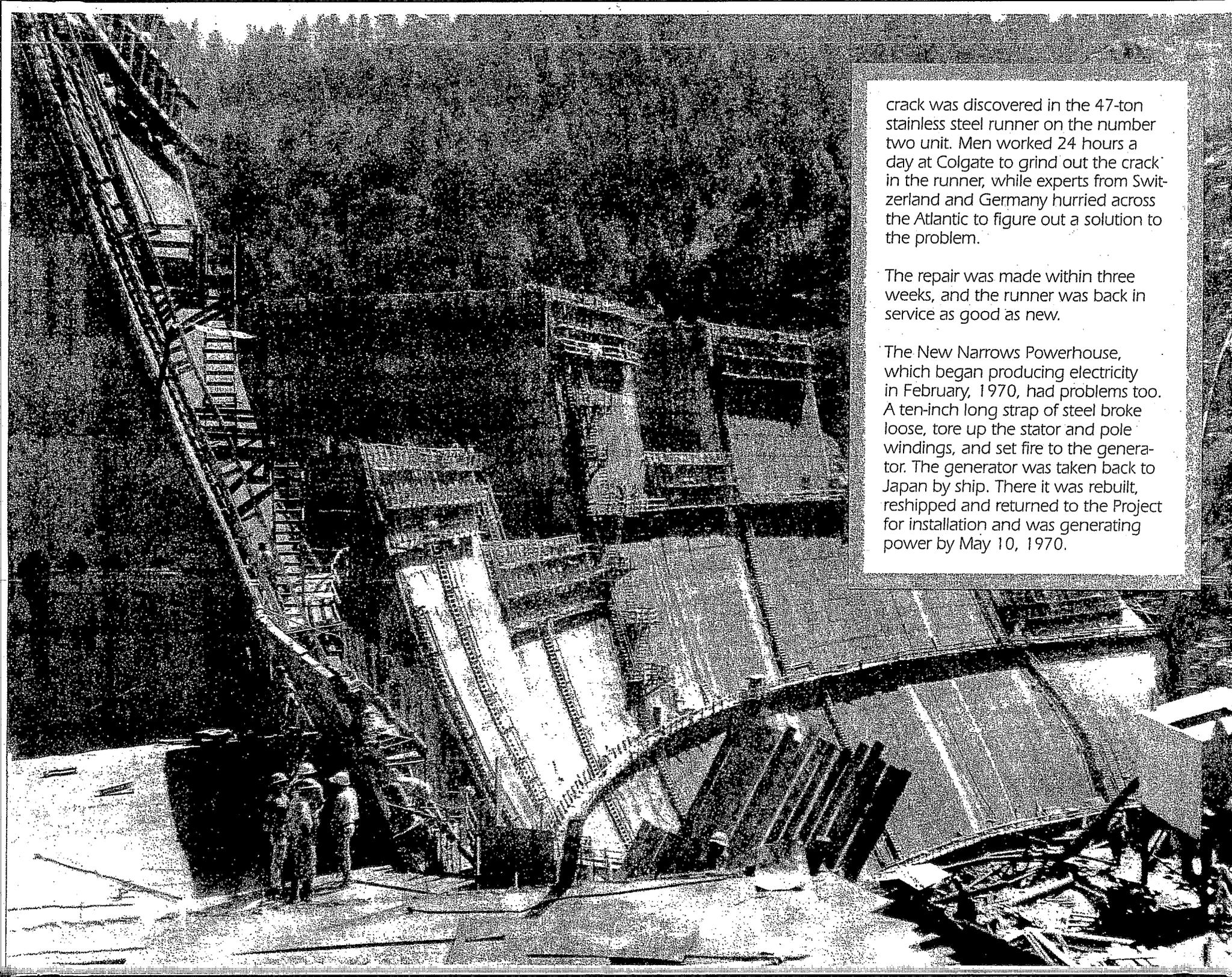
A half-mile of vapor lights strung across the canyon allowed shifts of men to work 24 hours a day for more than two years. Day in and day out concrete was continuously placed 20 hours a day.

In January 1969, a storm hit that produced a historic runoff on the river. Engineers had foreseen such an event and had required the center block of the dam be left lower to handle the Yuba. The waterfall that spilled over that center block was spectacular; even in its unfinished state the new dam had kept the Yuba from turning deadly and destructive.

By the end of 1969 the project was moving toward completion. New Bullards Bar Dam was completed and water was being stored in the new reservoir.

In early 1970 the New Colgate Powerhouse, which contained two of the largest turbines of their kind ever built, was ready for trial tests to produce electricity. The 1300-foot drop of water from behind New Bullards Bar Dam boosted the force of the water at each turbine to the equivalent of 212,000 horsepower. But within a month it was shut down when a

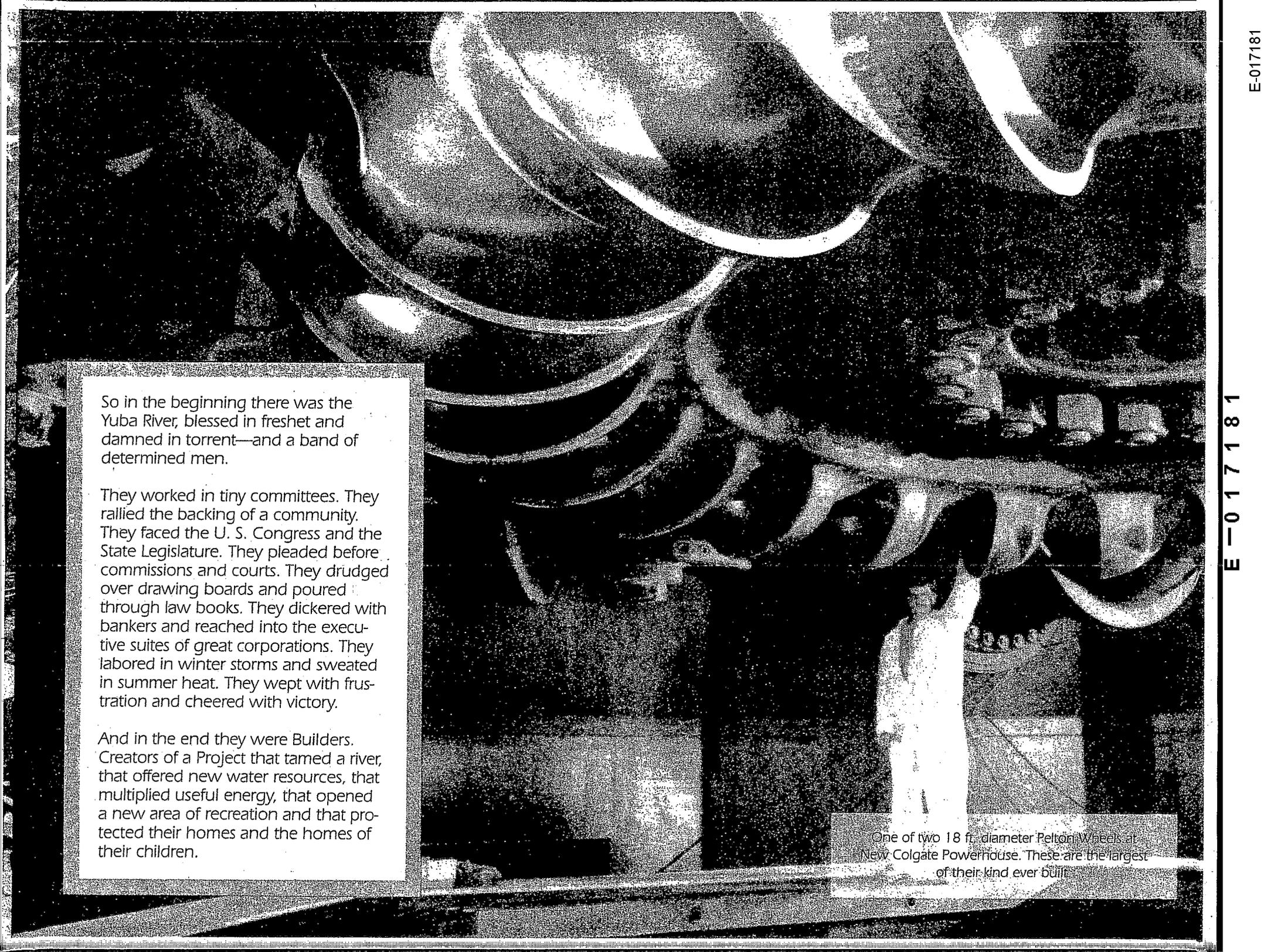




crack was discovered in the 47-ton stainless steel runner on the number two unit. Men worked 24 hours a day at Colgate to grind out the crack in the runner, while experts from Switzerland and Germany hurried across the Atlantic to figure out a solution to the problem.

The repair was made within three weeks, and the runner was back in service as good as new.

The New Narrows Powerhouse, which began producing electricity in February, 1970, had problems too. A ten-inch long strap of steel broke loose, tore up the stator and pole windings, and set fire to the generator. The generator was taken back to Japan by ship. There it was rebuilt, reshipped and returned to the Project for installation and was generating power by May 10, 1970.



So in the beginning there was the Yuba River, blessed in freshet and damned in torrent—and a band of determined men.

They worked in tiny committees. They rallied the backing of a community. They faced the U. S. Congress and the State Legislature. They pleaded before commissions and courts. They drudged over drawing boards and poured through law books. They dickered with bankers and reached into the executive suites of great corporations. They labored in winter storms and sweated in summer heat. They wept with frustration and cheered with victory.

And in the end they were Builders. Creators of a Project that tamed a river, that offered new water resources, that multiplied useful energy, that opened a new area of recreation and that protected their homes and the homes of their children.

One of two 18 ft. diameter Pelton Wheels at New Colgate Powerhouse. These are the largest of their kind ever built.

THE WATER'S JOURNEY

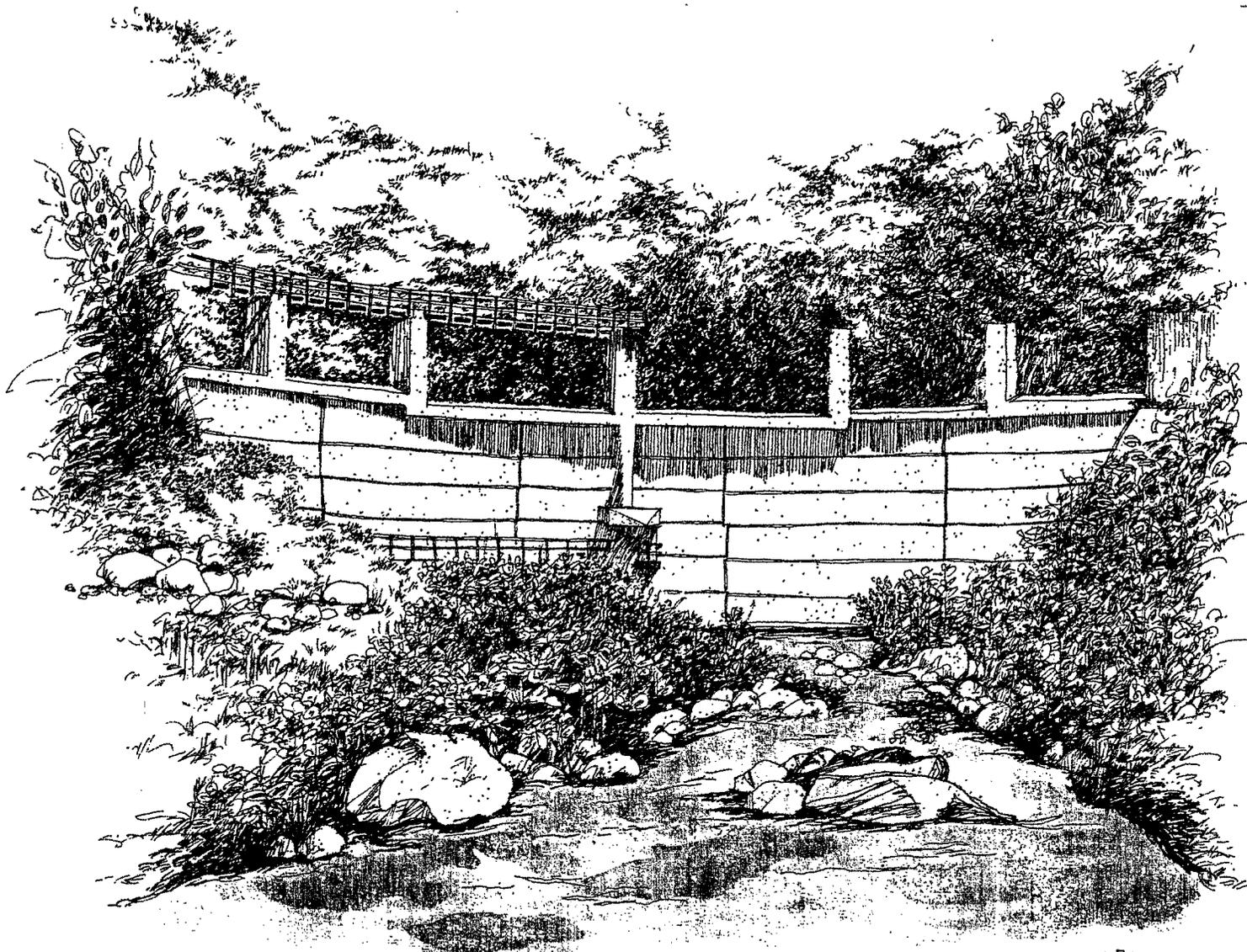
The Yuba begins as three rivers: North, Middle and South. In total they gather water from 1,357 square miles of watershed, which is never more than 35 miles wide at any one point. Jagged, rocky ridges separate the rivers for much of their journeys.

Agreements with local, state and federal agencies determine how much of the water will stay in the rivers' natural channels and how much will be diverted for a variety of beneficial uses.

Entities such as Nevada and Oroville-Wyandotte Irrigation Districts, Pacific Gas & Electric Company and individual water rights holders divert water from the Yuba River for their needs, both within and outside the Yuba watershed, before it ever reaches Y.C.W.A.'s facilities. Through their tunnels and canals Yuba River water is taken to the Feather, Bear and American Rivers.

North Yuba

The North Yuba starts its trek to the valley below at Yuba Pass, elevation 6,701 feet, near State Highway 49 in Sierra County. The river journeys in tandem with the state highway as far as Downieville where it leaves the road and flows westward to the New Bullards Bar Reservoir.



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OUR HOUSE DAM

Diverts Middle Yuba water through Lohman Ridge Tunnel to Log Cabin Dam

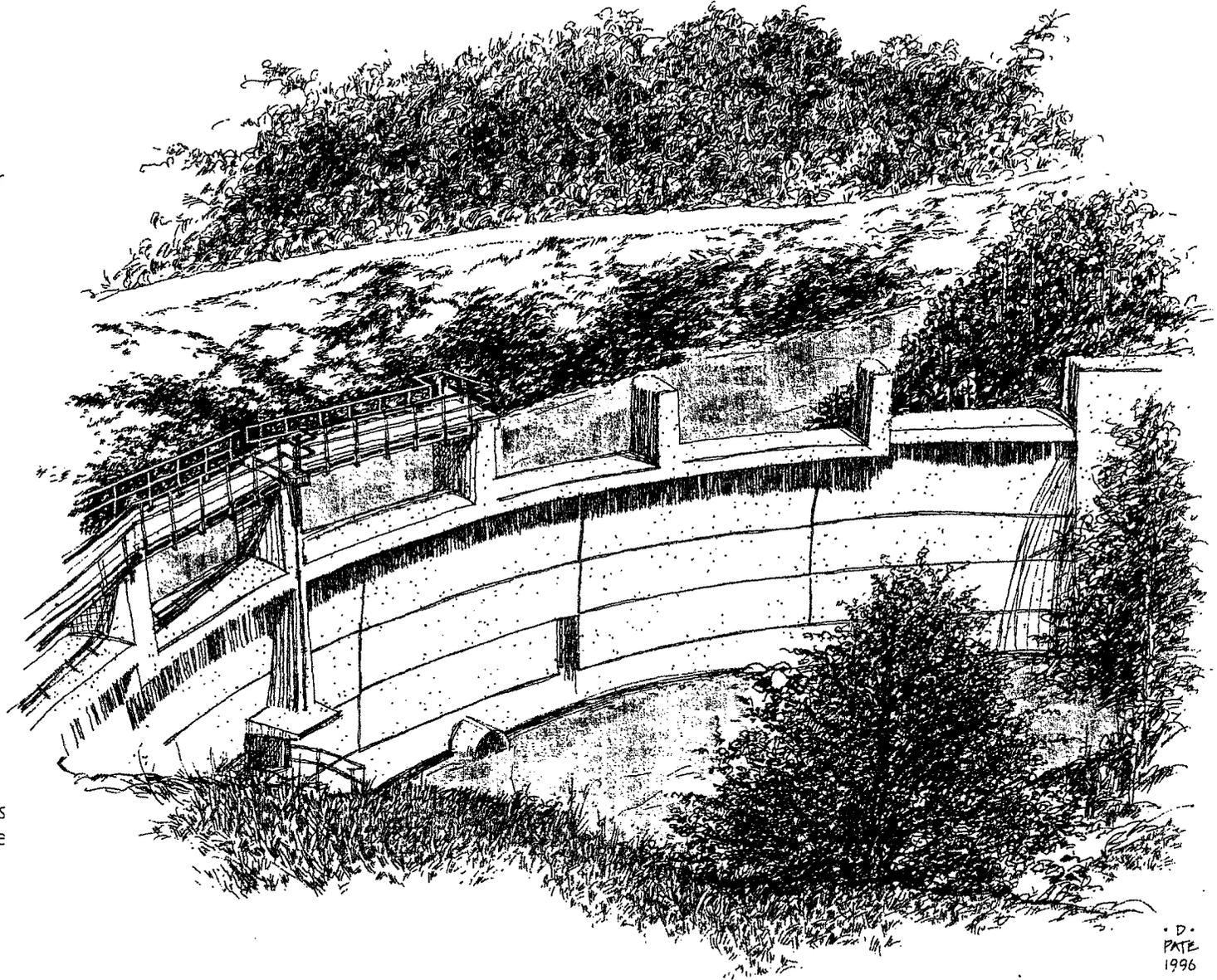
Middle Yuba

The Middle Yuba is born from snow runoff and rainwater gathered at Jackson Meadows Reservoir in Sierra County. It meanders and roars, depending on the season of the year, through narrow, steep canyons until it gets to the 75 foot high Our House Dam, southwest of Camptonville near the Sierra/Nevada County line.

Just upstream from the dam water is diverted into a 3.8 mile long tunnel that carries it to Oregon Creek near Camptonville. How much water can be diverted by the Agency is spelled out in two agreements:

- the Federal Energy Regulatory Commission (FERC) Project License and
- an agreement with the California Department of Fish and Game (CDF&G).

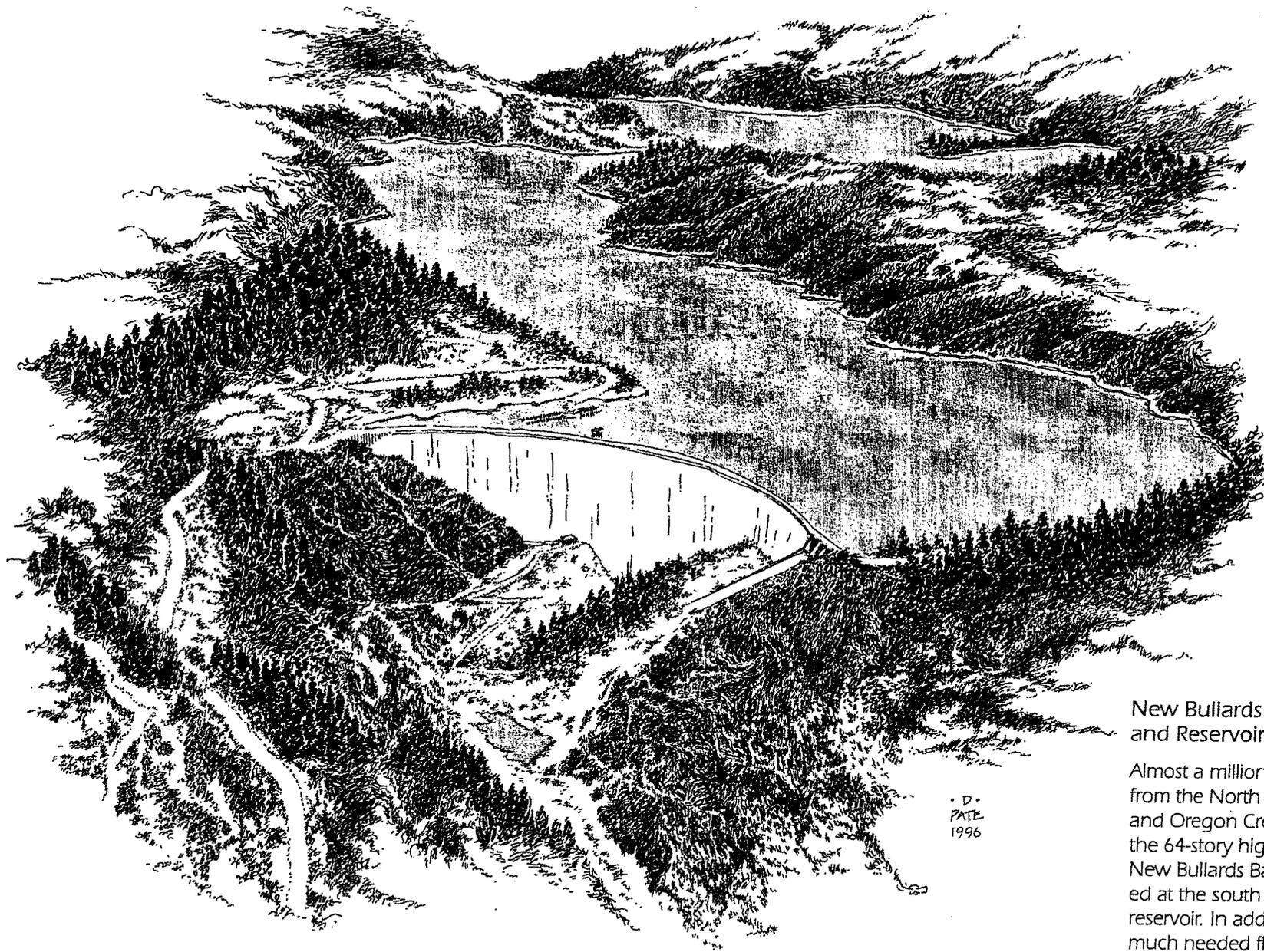
Emerging from the 3.8 mile long tunnel, Middle Yuba water flows into Oregon Creek where it travels a short distance to another dam, which is called Log Cabin. Just upstream from that 55-foot high dam Middle Yuba and Oregon Creek water is diverted into a 1.2 mile long tunnel that carries it to New Bullards Bar Reservoir where it joins water from the North Yuba. At the New Bullards Bar Dam water is released into a 4.7 mile long tunnel that carries it to the mammoth turbines that generate electricity at the New Colgate Powerhouse.



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1996

LOG CABIN DAM

Diverts Oregon Creek and Middle Yuba water through Camptonville Tunnel to New Bullards Bar Reservoir



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NEW BULLARDS BAR DAM AND RESERVOIR

New Bullards Bar Dam and Reservoir

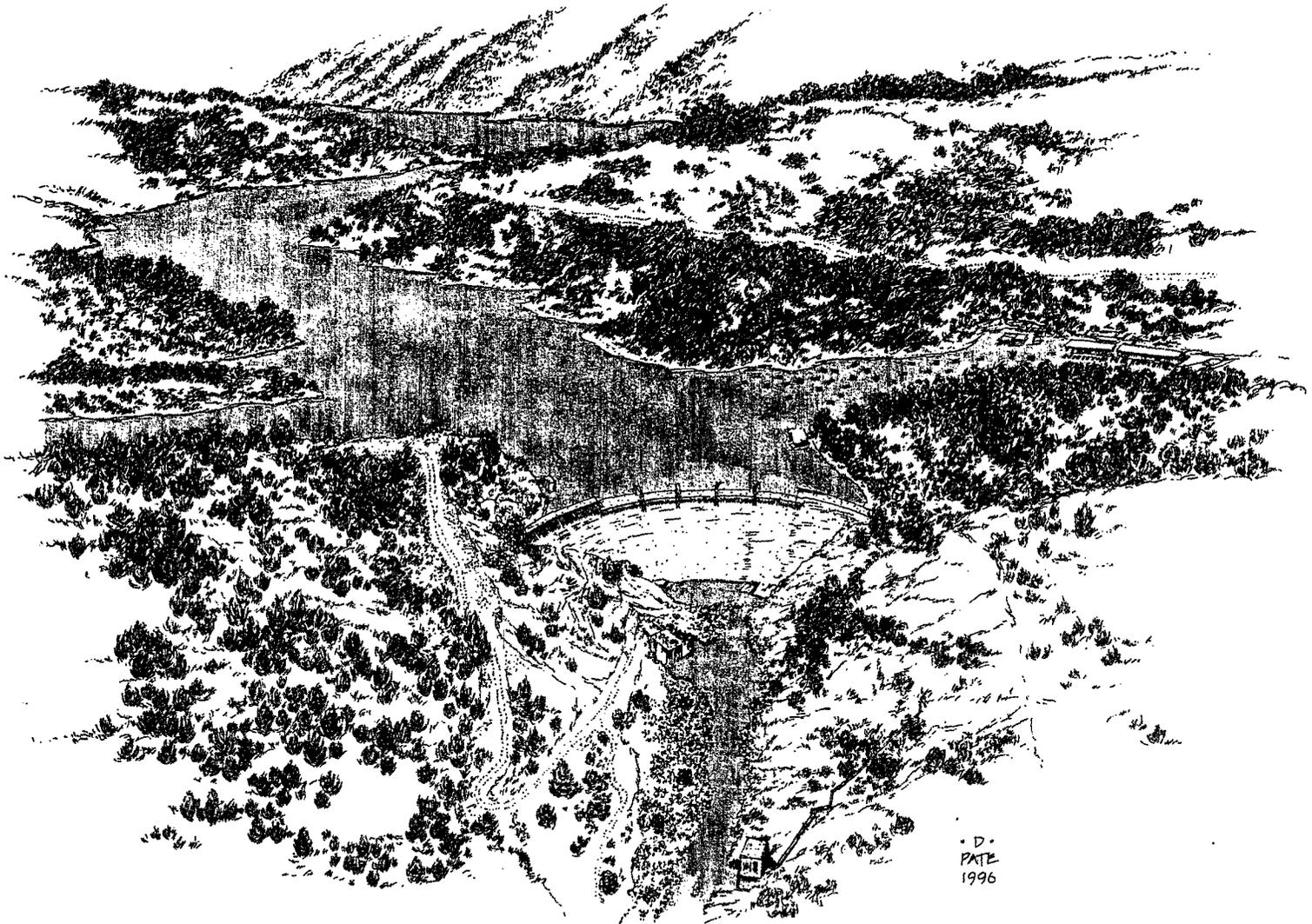
Almost a million acre feet of water from the North and Middle Yuba River and Oregon Creek are stored behind the 64-story high, 2,323 foot long New Bullards Bar Dam, which is located at the south end of a 16 mile long reservoir. In addition to providing much needed flood control, the reservoir is a prime recreation area and stores water for crop irrigation and energy generation, and influences downstream river temperatures for fishery enhancement.

South Yuba

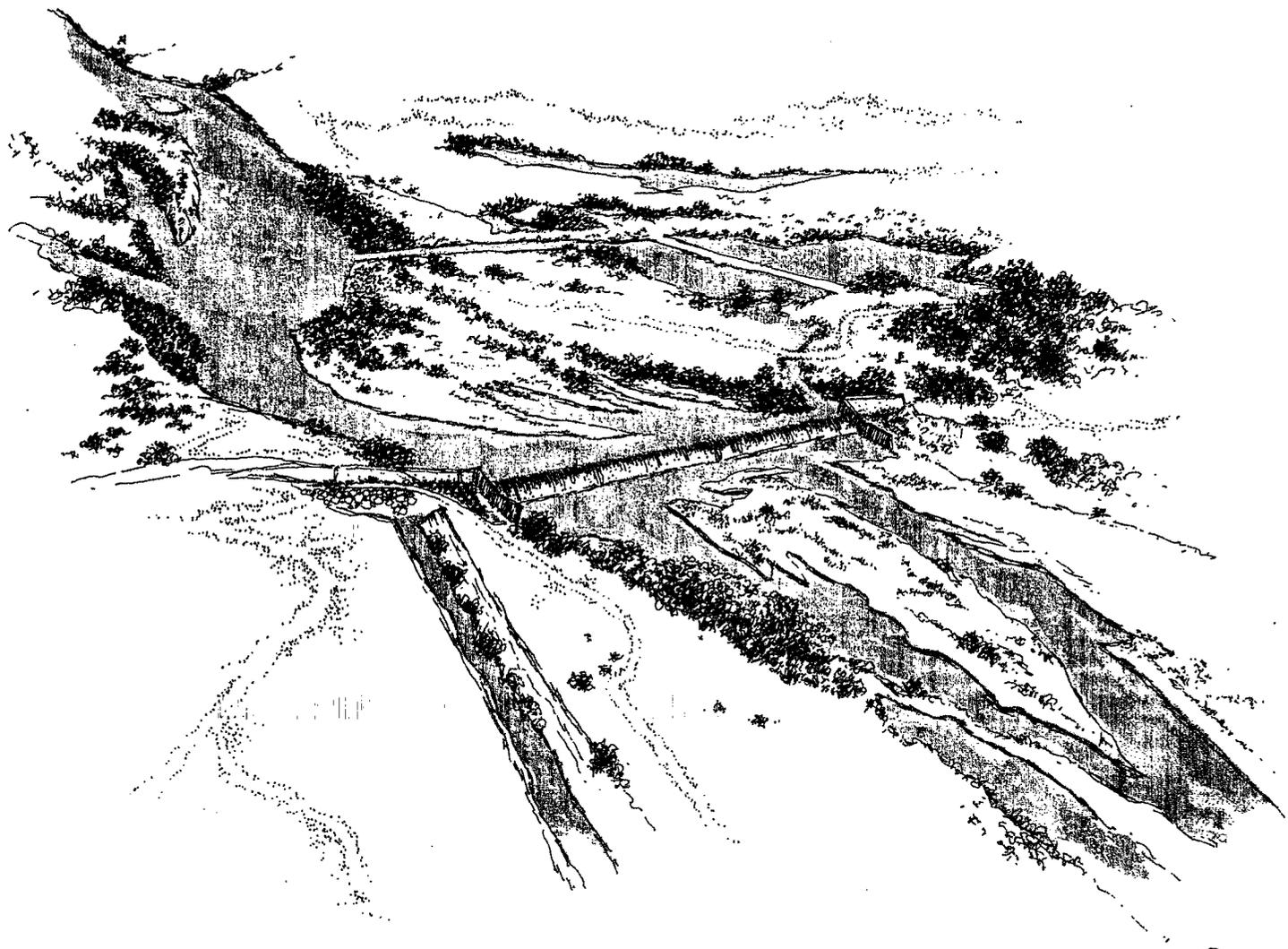
The South Yuba comes to life at 9,000 feet in Placer County near Castle Peak and Donner Lake. As you drive east or west on Interstate 80 between Emigrant Gap and Donner Pass you can catch glimpses of this pristine waterway on its journey to Englebright Reservoir and the main stem of the Yuba River many miles away. Dozens of creeks large and small flow into the South Yuba as it moves downhill through Placer and Nevada Counties to Yuba County near the old townsite of Bridgeport.

A few miles from Bridgeport the South Yuba joins its siblings—the North and the Middle—and flows into Englebright Reservoir, at a location 3.3 miles downstream from the New Colgate Powerhouse.

Englebright Dam, which is about 10 miles downstream of New Colgate Powerhouse, was built in 1941 by the U.S. Army Corps of Engineers. It was designed to keep upstream hydraulic gold mining debris out of the lower parts of the river. But by the time the dam was completed, World War II had put a stop to gold mining. Two tunnels at the dam move water to the turbines that generate electricity in the PG&E owned and operated Narrows 1 Powerhouse and the Yuba County Water Agency owned and operated Narrows 2 Powerhouse. The two powerhouses are located on opposite sides of the river.



U.S.C.E ENGELBRIGHT DAM AND RESERVOIR



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U.S.O.E. DAGUERRA POINT DAM

Yuba River

The combined water of the three rivers enters the 6,500 acre Yuba Goldfields a few miles above the Daguerra Point Dam, which is 12.3 miles below the Englebright Dam. In bygone days as many as 12 large bucket type dredges at a time crawled across the goldfields unearthing riches for some and then leaving behind mountains of some of the best aggregate in the country. Now just one dredge is active, the other floats amid the rocky landscape in a land-locked pond like a rusting metal ghost of California's historic past.

Daguerra Point Dam, originally constructed in 1906, was created to keep hydraulic gold mining debris from moving down the river where it would raise the river beds and further increase flood dangers. But now it is the primary diversion point for water to enter canals connected to irrigation districts located north and south of the river. There are fish ladders on both sides of the dam to help spawning salmon on their journey up the Yuba.

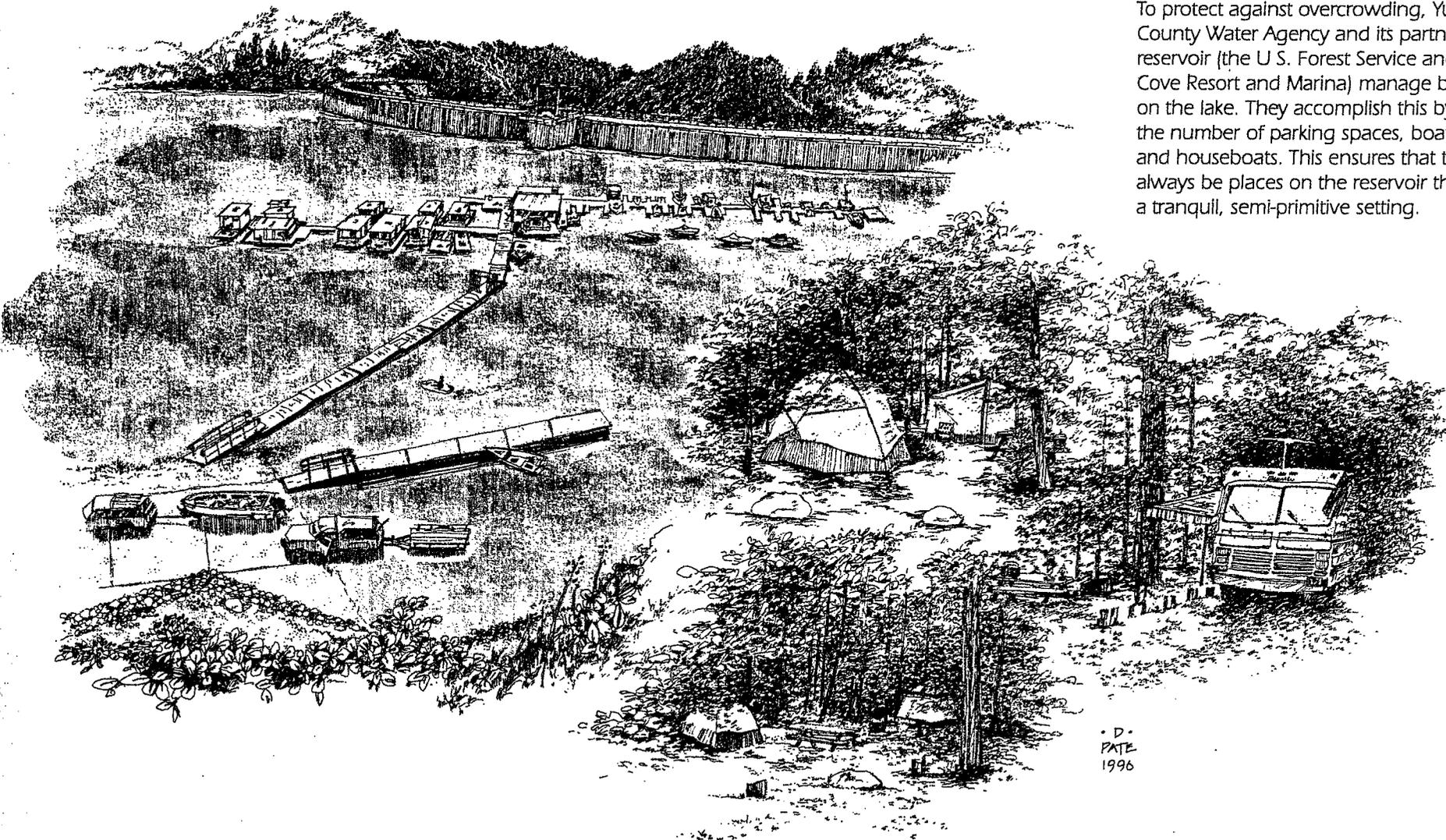
Miles downstream of Daguerra Point Dam the river flows past Marysville to a point where it joins the Feather River.

The high country water and melted snow that feed the Yuba are carried by the Feather River and finally the Sacramento River to the Delta where some is diverted onto Delta islands to irrigate crops and some is diverted by the giant state and federal pumps for irrigation and municipal supplies for the San Joaquin Valley and Southern California. The remainder then flows on to the Pacific Ocean through San Francisco Bay.

Recreation

The New Bullards Bar Reservoir has 55 miles of beautiful shoreline, most of it located in the Plumas and Tahoe National Forests. It offers opportunities to picnic, swim, water ski, fish, camp, hike, boat, mountain bike or cruise the reservoir aboard a fully-equipped houseboat.

To protect against overcrowding, Yuba County Water Agency and its partners at the reservoir (the U.S. Forest Service and Emerald Cove Resort and Marina) manage boat traffic on the lake. They accomplish this by limiting the number of parking spaces, boat launches and houseboats. This ensures that there will always be places on the reservoir that retain a tranquil, semi-primitive setting.



NEW BULLARDS BAR RECREATION OPPORTUNITIES

HYDROELECTRIC POWER

The Agency's power purchase contract with PG&E insures the repayment of the project bonds and provides funds for operation and maintenance, with the exception of recreation.

Yuba County Water Agency owns four powerhouses on the Yuba River watershed:

- New Colgate - 315 megawatts
- Narrows 2 - 47 megawatts
- Deadwood Creek - 2 megawatts
- Fish Release - 150 kilowatts

New Colgate Powerhouse provides more energy than any other hydroelectric facility supplying power directly to PG&E. The Colgate turbines are the largest of their kind ever built. Water carried nearly five miles from the New Bullards Bar Reservoir travels through a 26-foot-diameter tunnel, then plunges down a 15 foot diameter penstock to drive the two turbines which produce a total of 315 megawatts of electricity. That's enough electricity for a city of 350,000 people.

Narrows 2 Powerhouse, located just downstream of Englebright Dam, gets the water to drive its turbine from Englebright reservoir. Narrows 2 supplements the smaller PG&E Narrows Powerhouse, which is visible on the other side of the river and accessible only by a short, very steep funicular railway.

The Fish Release Powerhouse is so named because it generates power from the water released at the base of the New Bullards Bar Dam for fishery maintenance on the river. This facility was added by the Agency in 1986. If there is a power outage at the dam, this tiny powerhouse can be used to operate the massive spillway gates of the New Bullards Bar Dam.

Deadwood Creek Powerhouse is the most recent addition to the Agency's power producing capability. Located at the upper end of the New Bullards Bar Reservoir, it is accessible only by boat or hiking trail. It went into service in 1993, after the Agency bought the uncompleted project from creditors who had taken it over when earlier companies failed to complete construction.

COLGATE POWERHOUSE AND PENSTOCK

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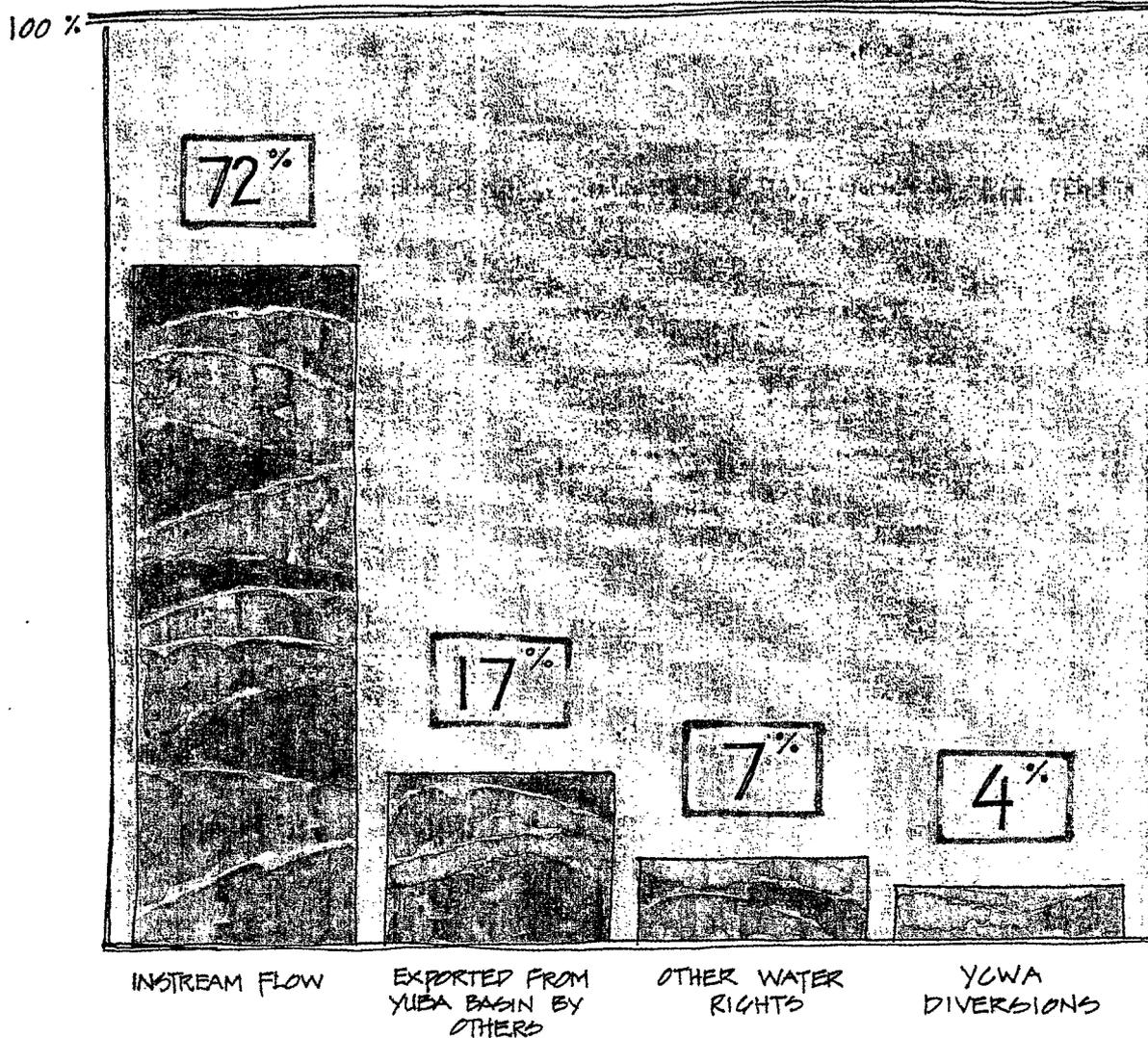
HOW THE YUBA RIVER WATER SUPPLY IS USED

WATER SUPPLY

During an average year, the annual snow and water runoff that passes down the Yuba River is about 2.4 million acre feet. The maximum annual runoff experienced on the river was nearly five million acre feet. Here's how that water is used:

- 4 percent is diverted by the Agency for irrigation supplies to seven water districts and companies, which will increase to 6 percent in the future
- 7 percent is diverted by other districts and individuals with their own water rights on the Yuba River
- 17 percent is diverted to other watersheds for water supply and production of electricity by PG&E and Nevada and Oroville Wyandotte Irrigation Districts
- 72 percent stays in the stream for fish and wildlife and either flows to the ocean or is diverted from the Delta by the state and federal projects and Delta water users

During high runoff years the Agency has sold excess water to help alleviate drought conditions being experienced elsewhere in California. It has sold water to various northern California cities, the California Department of Water Resources, other water or irrigation districts and the State Water Bank.

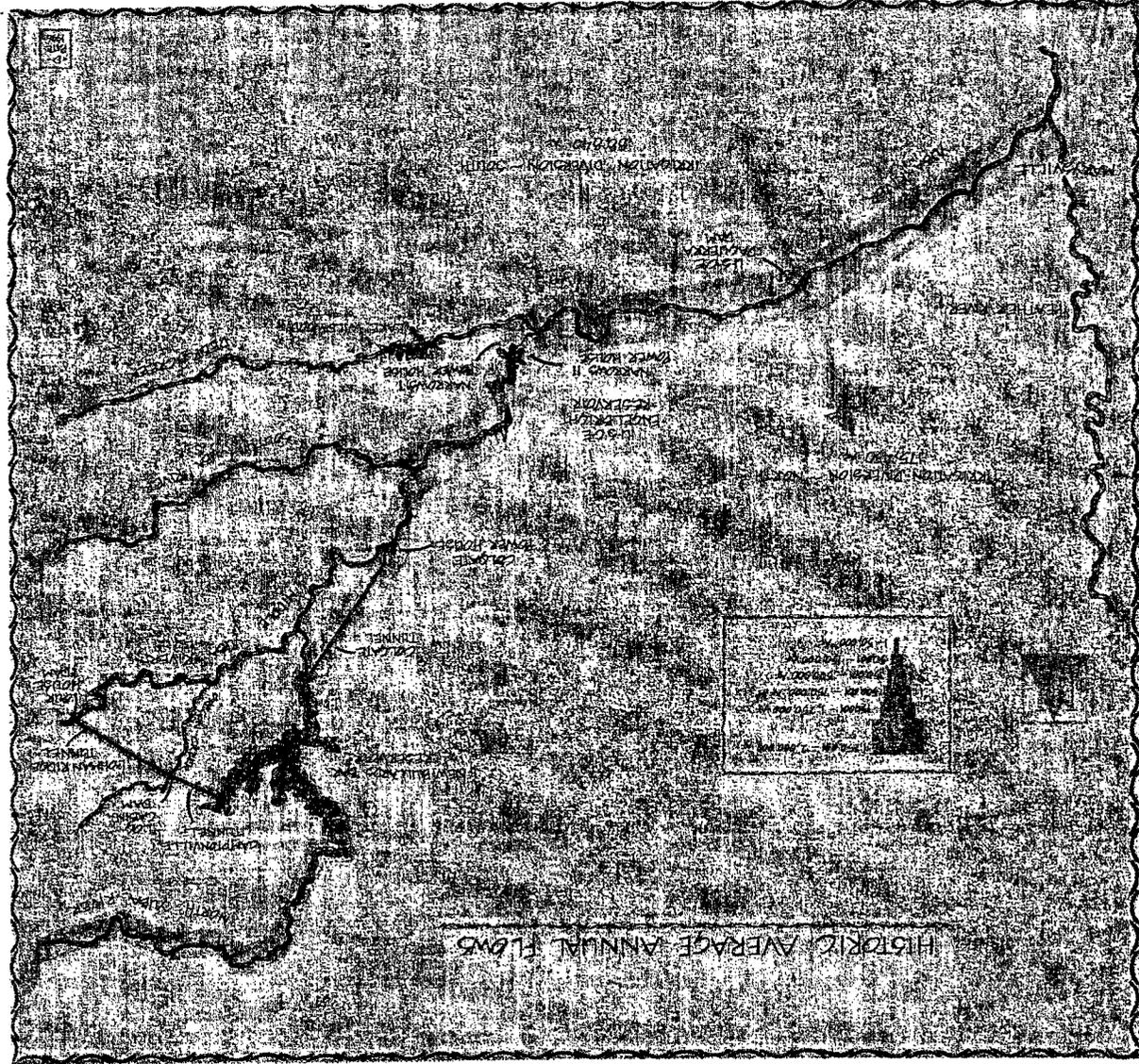


The need for flood control on the Yuba River was the principle reason for the creation of the Yuba County Water Agency and the construction of New Bullards Bar Dam on the North Yuba River.

Historically, the Marysville-Yuba City area has experienced the ravages of major flood about once every ten years. The discharge of debris from placer mines in Nevada County compounded the flooding problems because it raised the river beds by many feet.

Levees began providing flood control protection for Yuba City and Marysville as early as 1875 and are still heavily relied on for flood protection. This is primarily because there is no significant flood protection from the South Yuba River.

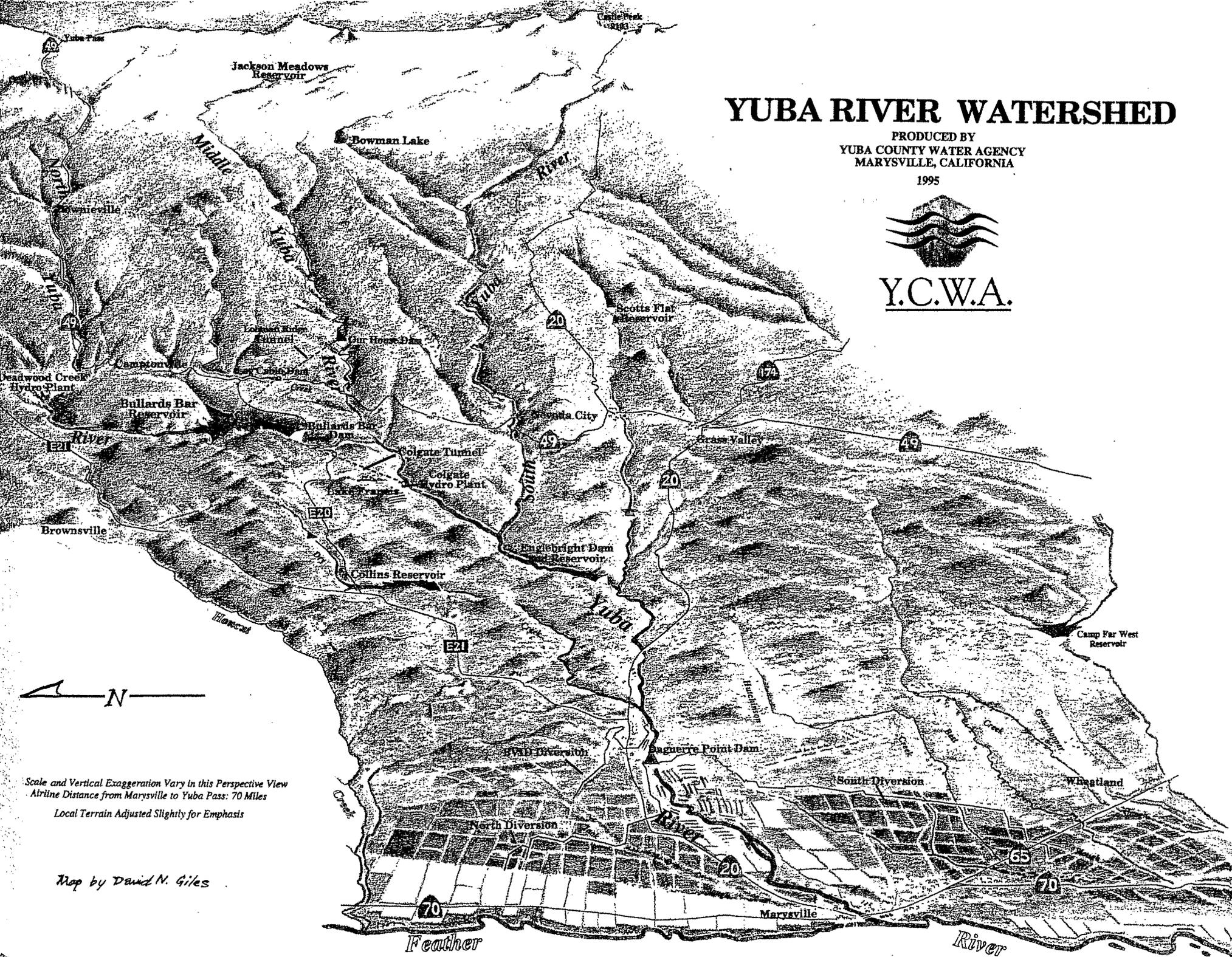
MAJOR FLOODS ON THE YUBA RIVER



YUBA RIVER WATERSHED

PRODUCED BY
YUBA COUNTY WATER AGENCY
MARYSVILLE, CALIFORNIA

1995

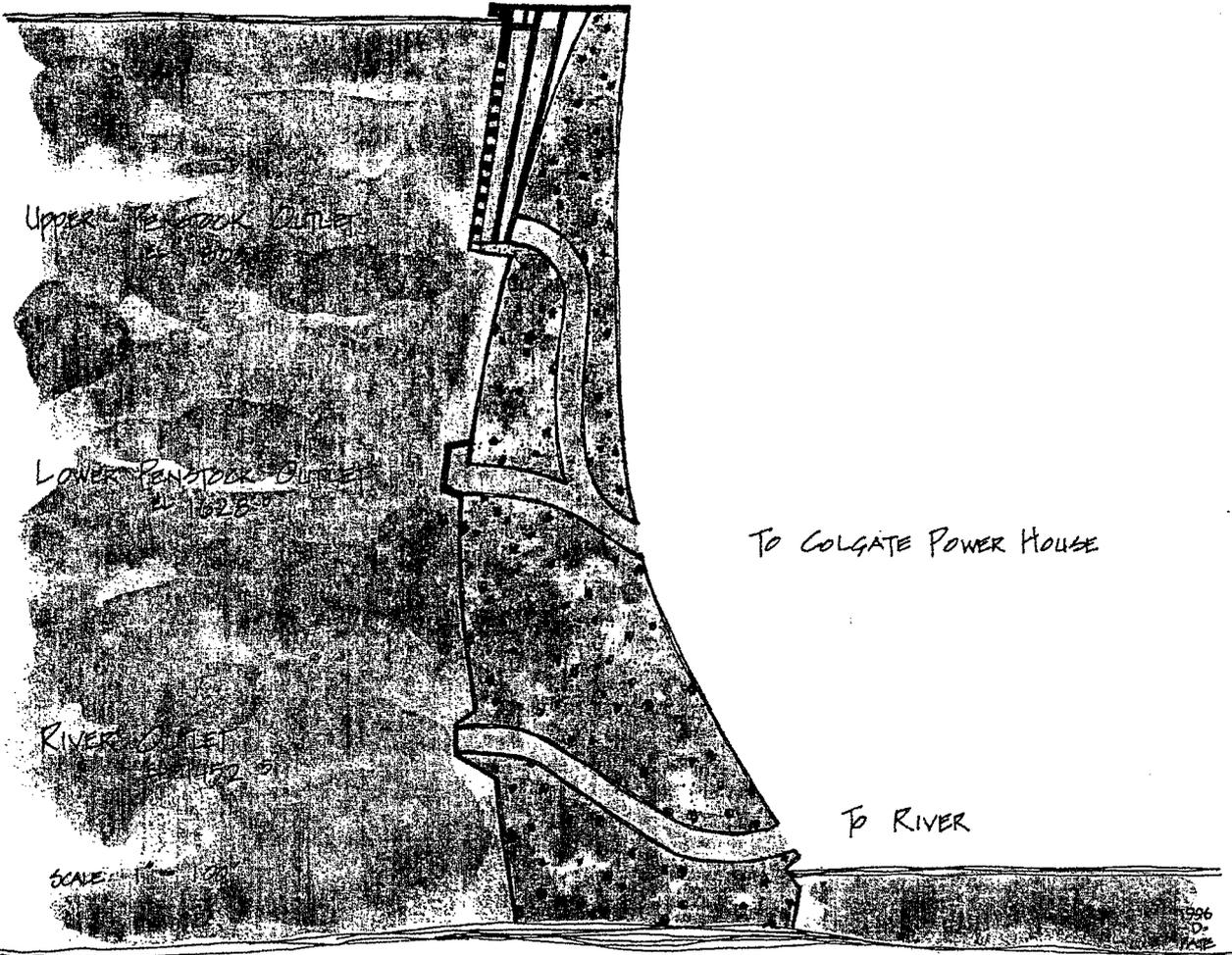


Scale and Vertical Exaggeration Vary in this Perspective View
Airline Distance from Marysville to Yuba Pass: 70 Miles
Local Terrain Adjusted Slightly for Emphasis

Map by David N. Giles

NEW BULLARDS BAR DAM OUTLET ARRANGEMENT

MAXIMUM WATER SURFACE
EL 1956.0



FISHERIES ENHANCEMENT

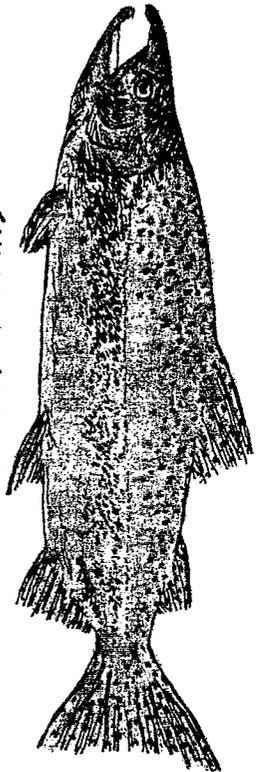
Since construction of the New Bullards Bar Dam, the number of chinook salmon returning to spawn in the Yuba River has averaged 13,090 per year. That's slightly above the average annual recorded number prior to construction. Steelhead, rainbow trout plus shad also flourish on the Yuba.

Chinook salmon have done this well on the Yuba because the Agency is able to influence water temperatures and stabilize flows downstream where the fish come to spawn. New Bullards Bar Dam has outlets at several elevations so water can be drawn from the elevation that will provide the best temperature for downstream fish. In mid-April water is drawn from closer to the surface of the reservoir to warm up the river for better growth and rearing conditions. In early October deeper water cools the Yuba for the chinook who need colder temperatures for successful spawning.

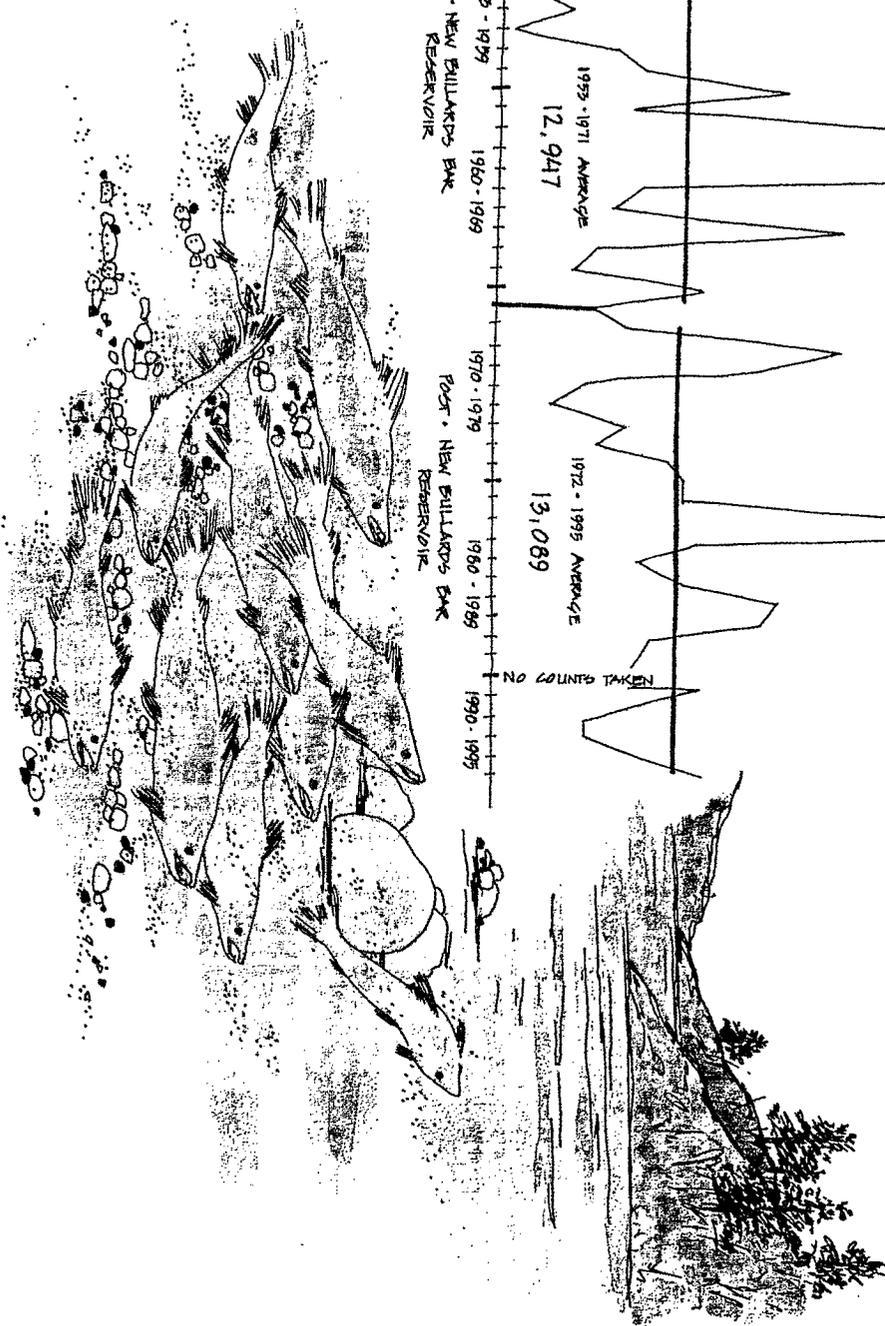
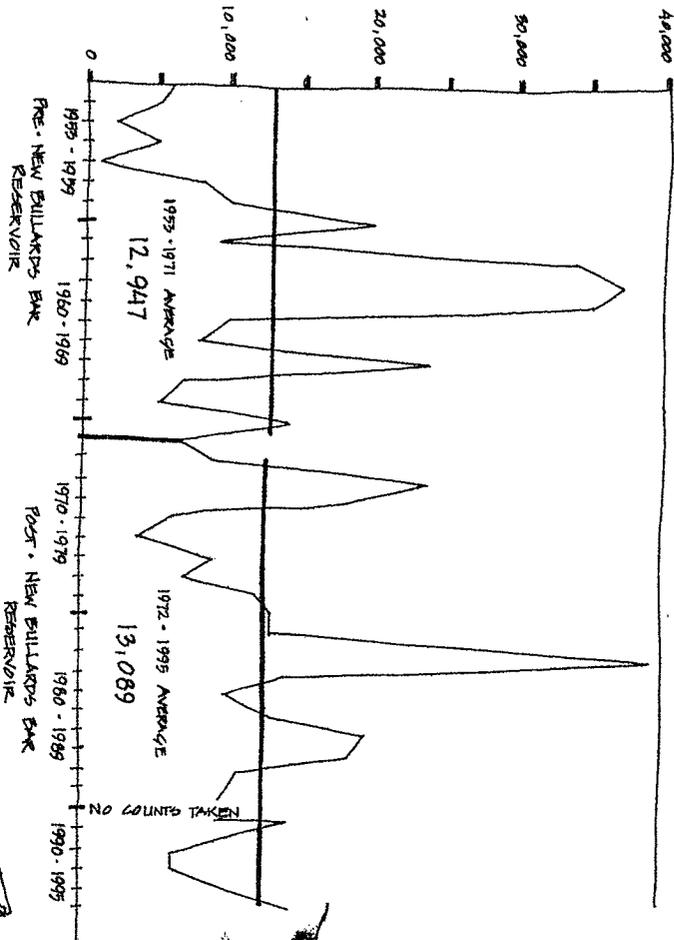
The Yuba is one of a few major California rivers that does not have a fish hatchery or a planting program. The California Department of Fish and Game manages the Yuba as a natural spawning river.

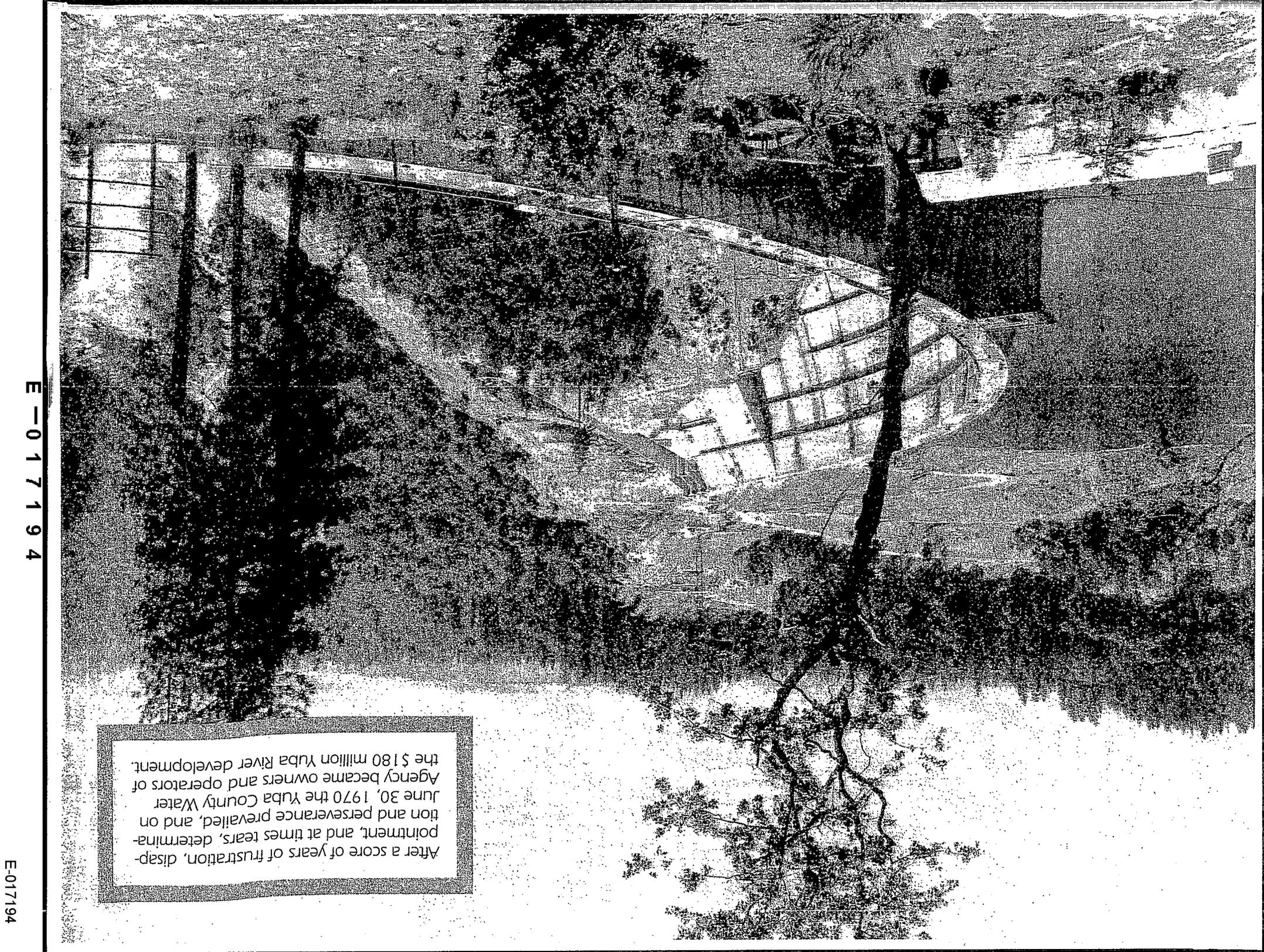
Cross Section of New Bullards Bar Dam showing multilevel outlets used to influence downstream temperatures for fishery enhancement.

SALMON RETURNING TO SPAWN IN THE YUKA RIVER

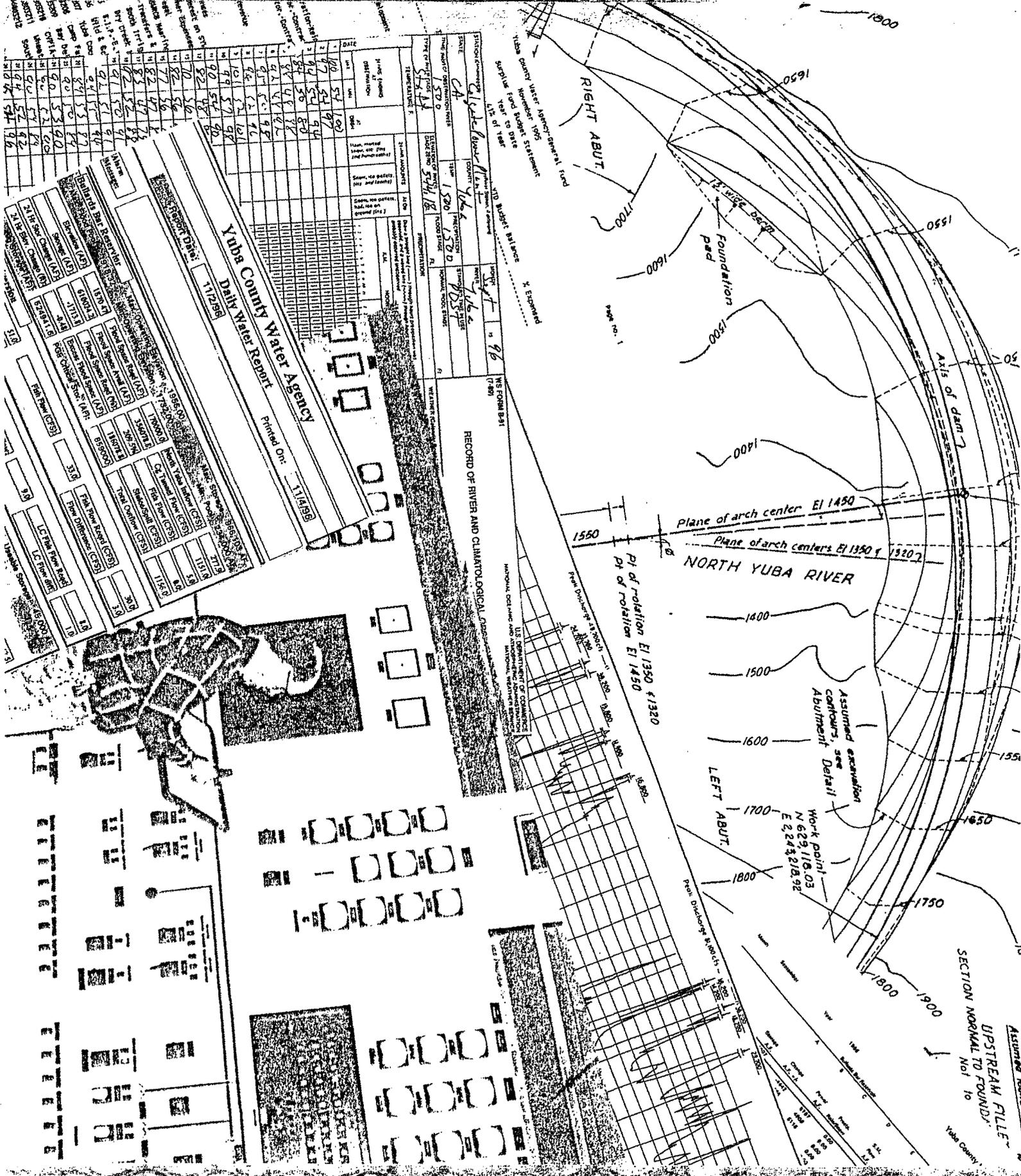


CHINOOK SALMON • KING.
ONCORHYNCHUS Tshawytscha





After a score of years of frustration, disappointment, and at times tears, determination and perseverance prevailed, and on June 30, 1970 the Yuba County Water Agency became owners and operators of the \$180 million Yuba River development.



DATE	TIME	WIND DIRECTION	WIND VELOCITY	WIND FORCE	WIND STATE	WIND EFFECT	WIND DAMAGE	WIND LOSS	WIND REPAIR
1900	5.1	180	9.7						
1901	5.1	180	9.7						
1902	5.1	180	9.7						
1903	5.1	180	9.7						
1904	5.1	180	9.7						
1905	5.1	180	9.7						
1906	5.1	180	9.7						
1907	5.1	180	9.7						
1908	5.1	180	9.7						
1909	5.1	180	9.7						
1910	5.1	180	9.7						
1911	5.1	180	9.7						
1912	5.1	180	9.7						
1913	5.1	180	9.7						
1914	5.1	180	9.7						
1915	5.1	180	9.7						
1916	5.1	180	9.7						
1917	5.1	180	9.7						
1918	5.1	180	9.7						
1919	5.1	180	9.7						
1920	5.1	180	9.7						

Yuba County Water Agency
Daily Water Report
 Printed On: 11/18/88

RECORD OF RIVER AND CLIMATOLOGICAL DATA

US FOREST SERVICE
 NATIONAL SYSTEM OF PUBLIC LANDS
 NATIONAL CLIMATE DATA CENTER
 NATIONAL WEATHER SERVICE

Station: **Yuba River**
 Elevation: **1500**
 Date: **11/18/88**

Work point: N 62° 18.03', E 2243.218.92

• FACTS AND FIGURES •

YUBA COUNTY WATER AGENCY DIRECTORS

Name	Years Served
Ray Brocker	1959-1960
Harold J. Sperbeck	1959-1960
John E. Furneaux	1959-1964
Charles E. Coupe	1959-1966
Charles F. Harvey	1959-1970
Charles Lembke	1961-1964
Ben Rose	1961-1968
Karl Cozad	1965-1969
Charles L. Dean	1965-1972
Roy G. Landerman	1967-1978
Harold J. Sperbeck	1969-1980
Peter A. Reis	1970-1972
Ronald E. Leri	1971-1974
Neil J. Denny	1973-1976
James Pharris	1973-1980
Jim Martin	1975-1978
Doug Waltz	1977-1984
Charlie Parker	1979-1982
George Deveraux	1979-1990
Arthur Bertolini	1980-1982
Charles Center	1981-1984
Samuel Shintaffer	1981-1984

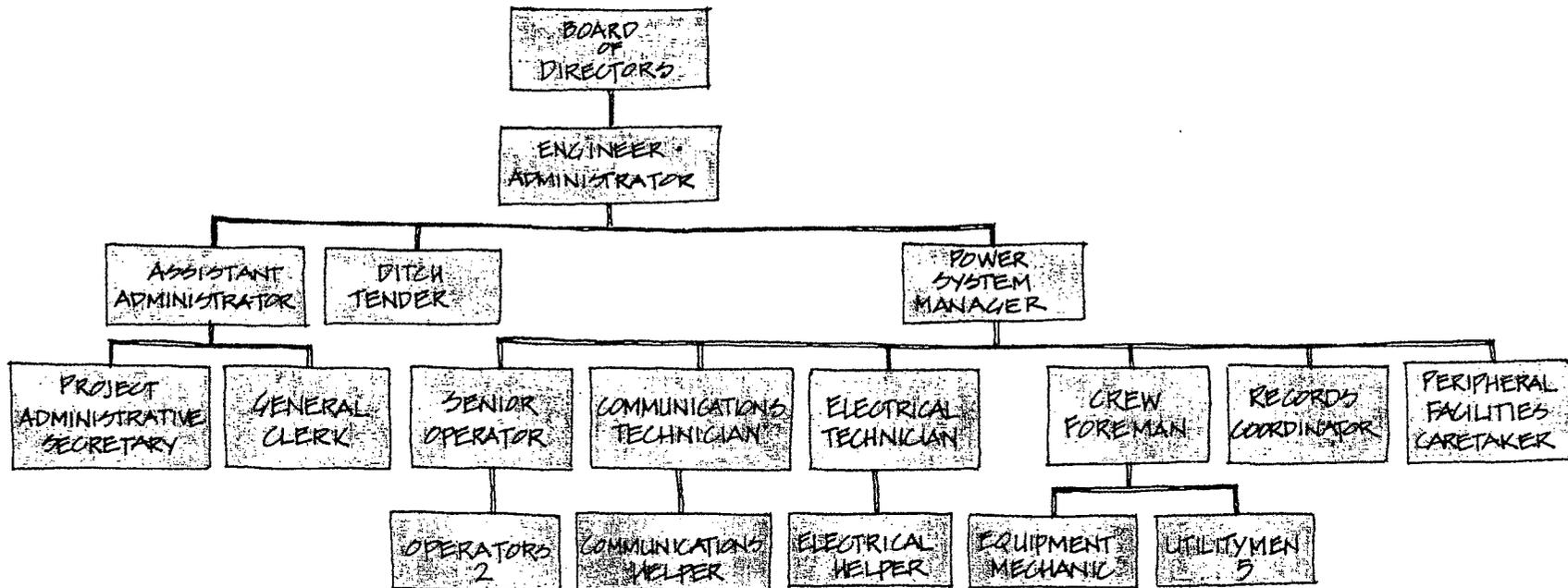
Name	Years Served
John Dower	1981-1988
Michael Rue	1982-1985
J.E. McGill	1983-1990
Charles Mathews	1985-1989
Bill Harper	1985-1992
Michelle D. Mathews	1985-1996
Brian Jones	1986
R. Donald Norene	1987
William H. Gilbert	1988-1989
Tib Belza	1989-To Date
Roger Murray	1990
John Rewis	1990
Leah Stocker	1991
Roy G. Landerman	1991-1992
John Mistler	1991-1994
Joan Saunders	1991-1994
James Sohrakoff	1991-1994
Brent Hastey	1993-To Date
Jay Palmquist	1993-1996
Al Amaro	1995-To Date
Bill Harper	1995-To Date
Hal Stocker	1995-To Date

ORGANIZATION

The Yuba County Water Agency Board of Directors consists of the five members of the County Board of Supervisors and two at large members, one elected from north of the Yuba River and one south of the Yuba River.

The Yuba County Water Agency employs an Engineer-Administrator who oversees a current staff of 22 employees, most of whom are disbursed throughout the Project operating, maintaining and administering powerhouses, dams, reservoirs, tunnels, and canals.

YUBA COUNTY WATER AGENCY • ORGANIZATIONAL CHART



NEW BULLARDS BAR DAM

Completed	1969
Crest length	2323 ft
Crest Width	25 ft
Crest above stream bed	645 ft
Crest above sea level	1965 ft
Spillway above sea level	1902 ft
Spillway gates, 3 tainter	30 ft x 53 ft
Spillway max. capacity	160,000 cfs
Dam Type: variable-thickness double-curvature monolithic concrete arch	
Volume	2,717,000 cy

COLGATE POWER TUNNEL

Tunnel diameter	26 ft
Tunnel length	24,137 ft

RESERVOIR

Capacity, acre feet	966,103
Water Surface, acres	4,790
Shoreline, miles	55
Watershed, sq. miles	485

OUR HOUSE DAM

(Diverts water thru Lohman Ridge Tunnel to Log Cabin Dam)	
Crest above stream bed	89 ft
Tunnel diameter	12.5 ft
Tunnel length	19,410 ft

LOG CABIN DAM

(Diverts water thru Camptonville Tunnel to New Bullards Bar Reservoir)	
Crest above stream bed	51.5 ft
Tunnel diameter	14.3 ft
Tunnel length	6,100 ft

POWER PLANTS:	Colgate (2 units)	Narrows	Fish Release	Deadwood Creek
Capacity, In megawatts	315	46.75	0.15	1.95
Turbine Power HP	212,000 ea	70,000	200	2610
Year In Service	1970	1970	1986	1993
Average Yearly Power Generation, in Gwh	1,314	248.4	1.3	5.1

YUBA RIVER FLOWS (UNIMPAIRED)

Average annual runoff	2,460,000 af
Minimum annual runoff	369,300 af
Maximum annual runoff	4,926,000 af
Maximum record flow	185,000 cfs

FLOOD STORAGE AND FLOWS

Flood storage space required from 1 November through 1 April	170,000 af
Yuba River channel capacity at Marysville when the Feather River is high and when the Feather is low	120,000 cfs 180,000 cfs
During the February 1986 Flood the peak flow at Marysville was	111,000 cfs
During this time the maximum release from New Bullards Bar was and the maximum flow past Englebright Dam was	50,000 cfs 100,000 cfs

SIGNIFICANT INFORMATION

- When installed the Colgate turbines were the largest impulse turbines ever constructed.
- The New Colgate Power Plant produces more energy than any hydroelectric plant in the Pacific Gas & Electric Company system.
- When the \$180,000,000 Yuba River Development Project was bid in 1966, it was the largest single construction contract of its kind.
- When installed the Colgate transformers were the heaviest load ever transported over California Highways.
- When constructed New Bullards Bar Dam was the longest double curvature thin shell arch dam ever built and is still the longest in the United States. It is also the tallest concrete dam in California.
- New Bullards Bar Dam contains 398 miles of cooling tubing.

ORIGINAL PROJECT FEATURES AND CONSTRUCTION COSTS

OUR HOUSE DAM & LOHMAN RIDGE TUNNEL 6,451,040
 Concrete dam 89' high on Middle Fork of Yuba in Sierra and Nevada Counties, 12.5' diameter tunnel to Oregon Creek, diversion only

LOG CABIN DAM & CAMPTONVILLE TUNNEL 2,763,370
 Concrete dam 57' high on Oregon Creek, Yuba County, 14.5' diameter tunnel to New Bullards Bar Reservoir, diversion only

NEW BULLARDS BAR DAM & RESERVOIR 108,987,237
 Concrete arch dam, overall height 645', length 2323', volume of concrete 2,717,000 cu.yds., reservoir capacity 966,103 AF, flood reservation 170,000 AF. Flood control, irrigation, storage, power generation, recreation, and fish enhancement

NEW COLGATE TUNNEL & POWER PLANT 20,053,125
 Tunnel diameter 26'
 Capacity 315,000 kw

NEW NARROWS POWER PLANT 3,821,487
 Capacity 46,750 kw

RECREATION FACILITIES
NEW BULLARDS BAR RESERVOIR 815,200

- 3 boat in camping areas with 38 units
- 2 picnic areas with 60 picnic units
- Drive in camping area with 96 campsites
- Drive in camping area with 6 group campsites
- 2 boat launching ramps (2 lanes each)
- Parking areas, roads and administration buildings, complete water and sanitation facilities
- Reservoir surface area 4600 acres
- Shoreline approximately 55 miles
- Summer water surface temperature 75 degrees

TOTAL PROJECT CONSTRUCTION COST 142,891,459

This is the largest single construction contract ever let in the United States. Interest, engineering, legal, rights of way and purchase of PG&E facilities and other costs bring the total to

180,200,000

FINANCING

Revenue Bonds, Series A - par value	160,740,000
Federal contribution for flood control	12,000,000
State (Davis-Grunsky) Recreation & Fish Grant	4,403,000
Remainder, as needed, Revenue Bonds, Series B	1,506,000

SUBSEQUENT FACILITIES AND COSTS

Fish Release Power Plant 396,117
 capacity 150 kw

Deadwood Creek Power Plant
 capacity 1950 kw
 Purchase Price 800,000
 Completion Costs 1,487,085

Water Conveyance Facilities

Goldfields Conveyance Facility Purchase	555,012
Brophy W.D. Main Canal Purchase	1,804,200
South Yuba W.D. Main Canal Purchase	2,246,242
South Yuba W.D. Syphon & Canal Extension, 30% of capacity	577,586
Camp Far West Diversion Structure	180,280

