

# HOOVER DAM



**U.S. DEPARTMENT OF THE INTERIOR, STEWART L. UDALL, Secretary**  
**Bureau of Reclamation, Floyd E. Dominy, Commissioner**



## BIRTH OF A PROJECT

HOOVER DAM WAS BORN OF NECESSITY. The Colorado River, for centuries, in its wild 1,400-mile descent from the lofty Rocky Mountains to the Pacific Ocean, had gouged great chasms such as Grand Canyon. Fed by melted snows in the spring and summer, the river yearly flooded low-lying farmlands along its route. Then in later summer and fall, the river dried to a trickle. Early settlers diverted water from the river with little success. There was either too much or too little. Floods destroyed crops, lives, and property, and often crops and livestock withered and died when the river ran too low to be diverted.

The disastrous flood in 1905-07 which swept through Imperial Valley in southern California provided added incentive for action. The Colorado River had to be controlled and regulated, but it was a long, drawn-out job.

Representatives of the 7 Colorado River Basin States met in Santa Fe, N. Mex., in 1922 and drafted the Colorado River Compact. This agreement divided use of the river's water between the upper and lower basins and paved the way for construction of works to control, regulate, and utilize the stream's natural resources. The Congress in 1928 passed the Boulder Canyon Project Act, authorizing construction of Hoover Dam and the All-American Canal System.

Hoover Dam is the key to all downstream control and regulation. The All-American Canal System takes water, controlled and regulated by Hoover Dam, from Imperial Dam westward to the Yuma, Imperial, and Coachella Valleys—southward and eastward to the valley and mesa lands of the Gila and Yuma Auxiliary Projects. There has never been a flood or drought on lands served by the lower Colorado River since Hoover Dam began storing water in 1935.



A giant rises in Black Canyon.



Hoover Dam as it looks today.

## RECLAMATION'S PIONEER PROJECT

HOOVER DAM PIONEERED Reclamation's present-day giant multiple-purpose developments. Its benefits encompass the whole concept of river control.

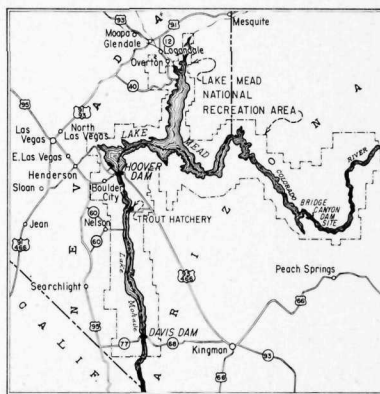
The dam controls floods and stores water for irrigation, municipal and industrial uses, hydroelectric power generation, recreation, and fish and wildlife.

Hoover Dam's reservoir—Lake Mead—stores more than 2 years of average Colorado River flow. This water is released in a regulated, year-round flow to farms, homes, and factories downstream. Passing through Hoover's turbines, it generates low-cost hydroelectric energy for markets in Nevada, Arizona, and California.

Water stored in Lake Mead irrigates  $\frac{3}{4}$  million acres of land in this country and nearly  $\frac{1}{2}$  million acres in Mexico. This water supplements the municipal and industrial needs of 10 million residents and generates about 4.5 billion kilowatt-hours of hydroelectric

energy annually. Sparkling clear reservoirs and river stretches, created by Hoover and other dams on the river, provide recreation for more than 5 million people each year. Fish and other wildlife abound in and around these bodies of water, once muddy and almost barren.

Hoover Dam changed the Colorado River from a natural menace to a national resource—strengthening the economy of the Pacific Southwest and the Nation.



## WATER FOR FARMS

COLORADO RIVER WATER stored behind Hoover Dam irrigates some of America's richest farmlands. Valley and mesa lands in the warm desert climate along the river grow winter fruits and vegetables and other nonsurplus crops throughout the year for the Nation's dinner tables. Yearly gross income from these crops is high—averaging hundreds of dollars per acre.

Major irrigation developments which benefit from Hoover Dam's control and

regulation of the Colorado River include the Palo Verde Valley, the Colorado River Indian Reservation, and the Yuma and Gila Projects in Arizona, and the Imperial and Coachella Valleys in California. When water reaches its farthest point on the All-American Canal System—which diverts from the Colorado River at Imperial Dam, 300 miles downstream from Hoover Dam—it has traveled some 500 miles since leaving Lake Mead and has required 10 days to make the trip.



Harvesting a bumper carrot crop near Indio, California.

## WATER FOR CITIES

HOOVER DAM'S REGULATION of the Colorado River assures municipal and industrial water for Los Angeles, San Diego, and other Pacific Southwest cities.

Since 1941, the Colorado River Aqueduct has delivered water from Havasu Lake behind Parker Dam to the Los Angeles metropolitan area. The San Diego Aqueduct, which began operations in 1947, taps the Colorado River Aqueduct to take water to the San Diego water system.

Parker Dam—155 miles downstream from Hoover Dam—provides a forebay and desilting basin for the Colorado River Aqueduct. Parker Dam was constructed with funds advanced by the Metropolitan Water District of Southern California. Part of the hydroelectric energy generated at Hoover and Parker Dams pumps water along the aqueduct. The 242-mile-long aqueduct has an annual capacity of 1,212,000 acre-feet, or a billion gallons of water a day. Five pumping stations lift this water 1,617 feet over mountain barriers between the Colorado River and the coastal plain.

Like Hoover Dam, the Colorado River Aqueduct was selected by the American Society of Civil Engineers as one of this Nation's Seven Modern Civil Engineering Wonders.

## WATER POWER FOR INDUSTRY

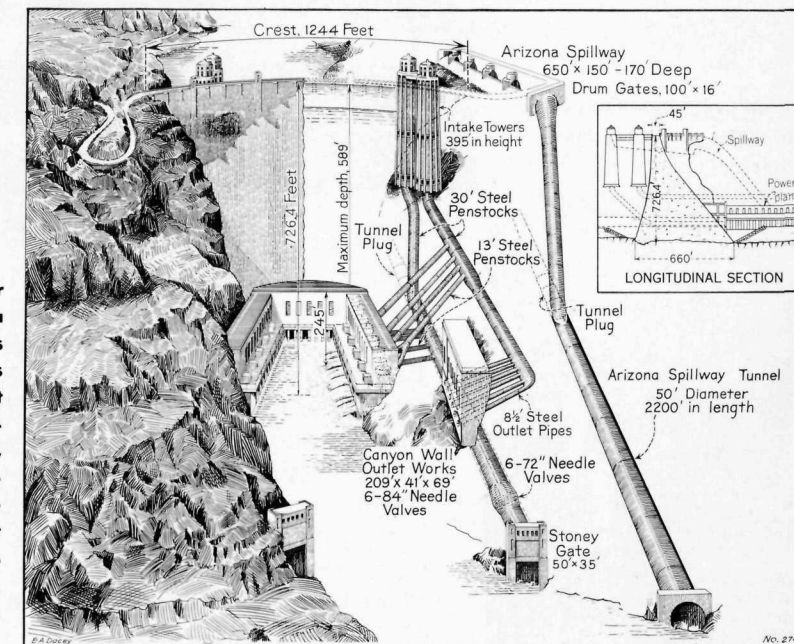
HOOVER DAM IS STILL one of the world's largest hydroelectric installations, with a nameplate capacity of 1,344,800 kilowatts, provided by 17 large generating units. The Hoover Powerplant became the world's largest plant in 1939, but lost this distinction in 1949 to another Reclamation development, Grand Coulee Dam in Washington, which has since been surpassed by others.

Hoover Dam's first generator, N-2, began commercial operation October 26, 1936, and the 17th and last generator went on the line December 1, 1961—25 years later.

Hoover Dam's approximate cost of \$175 million is being repaid over a 50-year period with the exception of a \$25 million flood allocation which has been deferred, without interest, until 1987. The project has grossed approximately \$205 million, with a net return to the Federal Treasury above operating costs of nearly \$110 million.

Hoover Dam energy is sold to both public and private agencies under contracts which expire in 1987. This energy is allocated as follows (by percent): States of Arizona and Nevada 17.6259 each, Metropolitan Water District of Southern California 35.2517, City of Burbank 0.5773, City of Glendale 1.8475, City of Pasadena 1.5847, City of Los Angeles 17.5554, Southern California Edison Co. 7.0503, and California Electric Power Co. 0.8813.

The City of Los Angeles Department of Water and Power and the Southern California Edison Co. operate Hoover Dam's generating equipment under contract as agencies of the Federal Government.



This shows how Hoover Dam works. The Nevada wall of Black Canyon is shown as solid, whereas the Arizona wall is cut away to reveal the intake towers, spillway, penstock pipes, and outlet works. Inside the Nevada wall, a similar set of diversion works has been placed. The principal dimensions are shown.



## WATER FOR RECREATION, FISH AND WILDLIFE

HOOVER DAM AND ITS LAKE MEAD have created one of America's most popular recreation areas. A 12-month season attracts more than 3 million visitors each year for swimming, boating, skiing, and fishing. Large-mouth bass, bluegill, black crappie, channel catfish, and other species abound in the lake. There is no closed season on fishing, and anglers take large numbers of game fish from the lake each year.

Lake Mead—extending 115 miles upstream into the lower end of Grand Canyon and with a shoreline of 550 miles—was named in honor of Dr. Elwood Mead, Commissioner of Reclamation from 1924 to 1936.

The lake and surrounding area are administered by the National Park Service as part of the Lake Mead National Recreation Area. The area also includes Lake Mohave, which extends from Davis Dam, 67 miles downstream, to the tailrace of Hoover Dam.

The cold waters in upper Lake Mohave—drawn from the depths of Lake Mead and stocked by a modern fish hatchery at Willow Beach—provide trout fishing.

The Southwest's playground—  
Lake Mead National  
Recreation area.



Such fish are caught the year  
round in the pure Lake Mead  
waters.



### GUIDED TOURS

BUREAU OF RECLAMATION tour leaders conduct visitors through Hoover Dam daily between 7 a.m. and 8 p.m. from Memorial Day through Labor Day, and from 8 a.m. to 5 p.m. daily the remainder of the year. In addition, an exhibit building, housing a model of a generating unit and a topographical model of the Colorado River Basin, is open to the public. More than 9 million visitors have gone through the dam and powerplant since the guided tours began in 1937. More than a half-million people take the conducted tours each year.



## HOOVER DAM—ONE OF THE SEVEN WONDERS

THE AMERICAN SOCIETY OF CIVIL ENGINEERS selected this pioneer Reclamation multipurpose project on the Colorado River in Black Canyon between Nevada and Arizona as one of this country's Seven Modern Civil Engineering Wonders. A bronze plaque—mounted in a concrete pedestal on the upstream roadway parapet at the center of the dam with Arizona on one side and Nevada on the other—records this honor for visitors to see.

Hoover Dam was without precedent—the greatest dam construction of its day. This arch gravity dam—rising 726.4 feet above bedrock—still holds the distinction of being the western hemisphere's highest. And its reservoir, Lake Mead—backing up 115 miles behind the dam and capable of storing nearly 30 million acre-feet of water—is still this hemisphere's largest man-made reservoir.

Hoover Dam is 660 feet thick at its base, 45 feet thick at its crest, and stretches 1,244 feet across the canyon. Some 4,400,000 cubic yards of concrete were placed in the dam, powerplant, and related structures.

Construction of Hoover Dam started in 1931. The dam began impounding water in its reservoir February 1, 1935, and the last concrete was placed in the dam proper the following May 29. President Franklin Delano Roosevelt dedicated Hoover Dam on September 30, 1935. The dam was completed 2 years ahead of schedule. The powerplant structures were completed in 1936, and the powerplant's first generator—N-2—went into commercial operation October 26 of that year. The 17th and final generating unit—N-8—went into commercial operation December 1, 1961, to complete the Hoover Powerplant, raising its nameplate capacity to 1,344,800 kilowatts—keeping it as one of the world's largest hydroelectric installations.

## HOOVER DAM FILM AVAILABLE

A 28-minute, 16 mm. color film, *THE STORY OF HOOVER DAM*, is available upon request for showing to school and civic groups, clubs, and other public gatherings, and on television stations. Prints of this film may be ordered from the U.S. Department of the Interior, Bureau of Reclamation (code 915), Washington 25, D.C., the U.S. Department of the Interior, Bureau of

Reclamation (code 841), Building 53, Denver Federal Center, Denver 25, Colo., or the U.S. Department of the Interior, Bureau of Reclamation, Boulder City, Nev., whichever is nearest. There is no cost to the borrower except return postage.

The film tells a dramatic story of Hoover Dam's construction and its impact on life in the Pacific Southwest.

## PHYSICAL DATA

### THE DAM

It is ..... 726.4 feet high  
Its crest is ..... 1,244 feet long  
At top it is ..... 45 feet thick  
At bottom it is ..... 660 feet thick  
It contains 3/4 million cubic yards of concrete.

### THE RESERVOIR

Lake Mead when full is ... 115 miles long  
Its capacity at top of spillway gates in raised position is ... 29.8 million acre-feet  
Its maximum depth is ..... 589 feet  
At maximum elevation (1,229 feet above sea level) it covers ..... 163,000 acres

### THE POWERPLANT

Its capacity is ..... 1,344,800 kilowatts  
Its 17 large generators are rated at:  
One ..... 95,000 kilowatts  
Fourteen ..... 82,500 kilowatts each  
One ..... 50,000 kilowatts  
One ..... 40,000 kilowatts  
Each of its 2 station service generators is rated at 2,400 kilowatts.

### Its 17 large turbines are rated at:

Fifteen ..... 115,000 horsepower each  
One ..... 70,000 horsepower  
One ..... 55,000 horsepower  
Each of its 2 station service turbines is rated at 3,500 horsepower.



*In its assigned function as the Nation's principal natural resource agency, the Department of the Interior bears a special obligation to assure that our expendable resources are conserved, that renewable resources are managed to produce optimum yields, and that all resources contribute their full measure to the progress, prosperity, and security of America, now and in the future.*

[1963]

U.S. GOVERNMENT PRINTING OFFICE : 1963 OF—677325

# HOOVER DAM



U.S. DEPARTMENT OF THE INTERIOR, STEWART L. UDALL, Secretary  
Bureau of Reclamation, Floyd E. Dominy, Commissioner