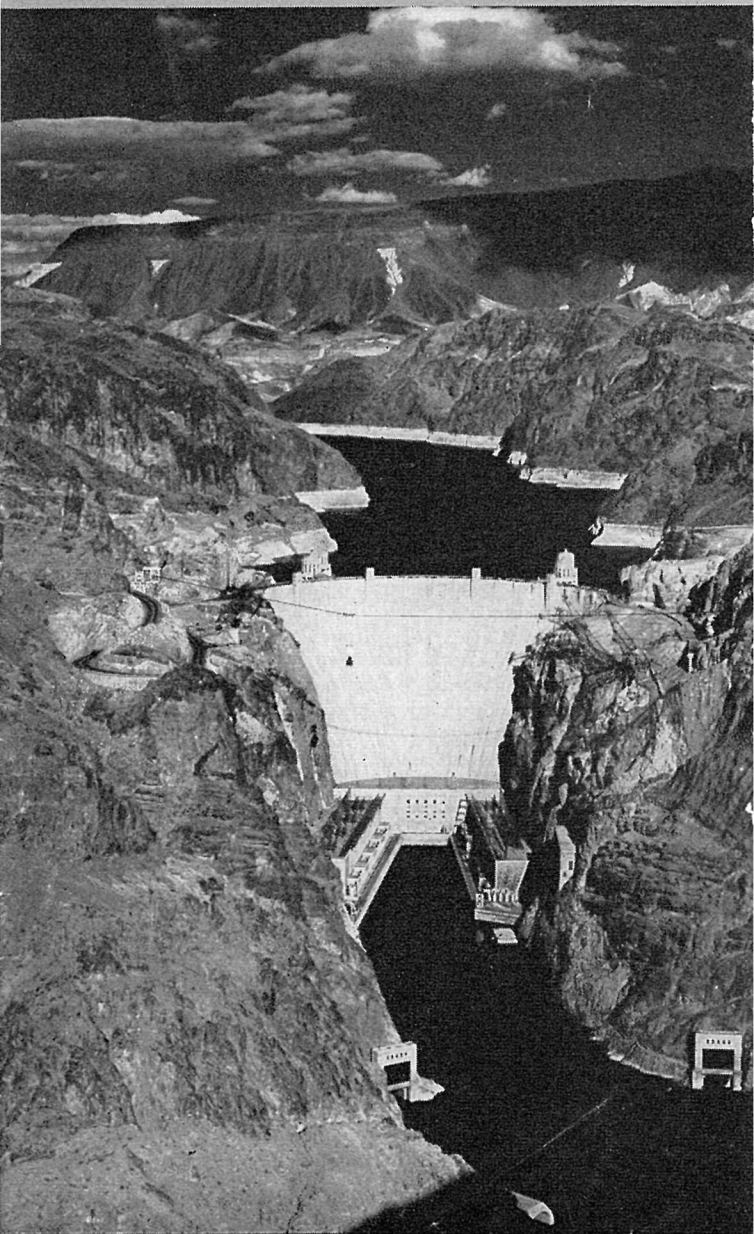


# HOOVER DAM



**UNITED STATES DEPARTMENT OF THE INTERIOR**

**Fred A. Seaton, Secretary**

**Bureau of Reclamation, W. A. Dexheimer, Commissioner**

## History

COMPLETION OF HOOVER DAM marked an epoch in river control and reclamation. It changed the once unruly Colorado River from a natural menace into a national resource.

Along the course of the lower river, fertile soils abound, as today's developments in California's Imperial, Coachella, and Palo Verde Valleys and southwestern Arizona's Yuma and Gila Valleys amply testify. However, fertile soils without adequate water are of little value, and in these arid regions the only substitute for scanty rainfall is irrigation.

Early settlers sought to obtain water supplies by diversions from the river. But time and again irrigators saw their crops swept away by early season floods or, later in the year, watched their fields wither as the river's water dwindled under the burning sun.

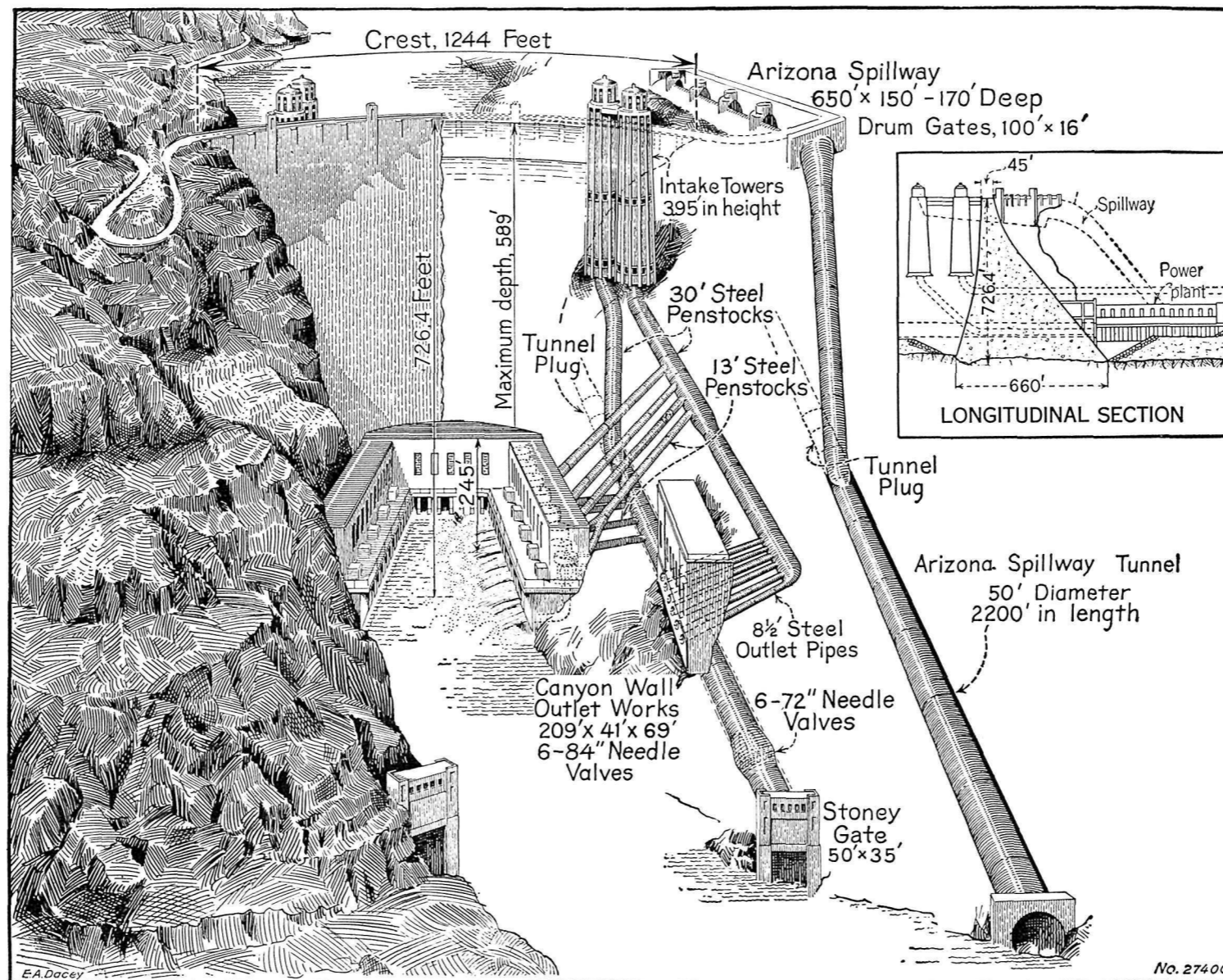
However, the early settlers believed in the land. Although early efforts to protect the valleys from floods were not always successful, the idea of eventual conquest of the river persisted.

In order to prepare for orderly control and development of the river, representatives of the Federal Government and of the seven States within whose boundaries the Colorado River Basin lies met in 1922 at Santa Fe, N. Mex., and drafted the Colorado River Compact. The Compact, dividing the use of water between the upper and lower Basin States, was an important factor in the building of a large flood control and storage reservoir in aid of lower Basin projects.

In 1928, the Congress passed the Boulder Canyon Project Act, authorizing the Bureau of Reclamation to proceed with the Boulder Canyon project. The project's most spectacular feature, Hoover Dam—originally planned for a site in Boulder Canyon and known for over a decade as Boulder Dam—was begun in Black Canyon in 1931 and was dedicated in 1935. For the first time, man succeeded in harnessing the lower Colorado River. Commercial power production was started in 1936. On April 30, 1947, the Congress enacted Public Law 43, which gave the dam its present name.

Hoover Dam is the key to control of the lower Colorado River. By capturing in its reservoir, Lake Mead, the water that pours seaward from the high mountains in the upper part of its drainage basin, it protects areas below Black Canyon from floods and stores water for irrigation and for domestic and industrial use. A beautiful lake where all types of water sports flourish, Lake Mead is a magnet attracting millions of visitors annually. Hoover Dam, by controlling the lower river, has made feasible the building of additional dams downstream. Davis and Parker Dams produce electrical energy urgently needed in the expanding Southwest. Parker, Headgate Rock, and Imperial Dams divert water for irrigation and for domestic and industrial use. All of these dams contribute to the further regulation of the river and provide recreational and fish and wildlife benefits.

# How Hoover Dam Works . .



THIS DRAWING shows how Hoover Dam works. The Nevada wall of Black Canyon is pictured as solid rock, but the Arizona wall has been cut away to reveal the intake towers, spillway, penstocks, and outlet works. A similar set of diversion works is located inside the Nevada wall. Principal dimensions are shown.

The powerplant, situated in the bottom of

the canyon, is as long as two city blocks and as high as a 20-story building. Fourteen units rated at 82,500 kilowatts each, one unit rated at 50,000 kilowatts, one at 40,000 kilowatts, and two 2,400-kilowatt station service units make the present installed capacity 1,249,800 kilowatts. Space is available for one 104,500-

kilowatt unit, which will raise the capacity to 1,354,300 kilowatts.

The tunnels used to divert the river around the dam site during construction now are utilized as a part of the penstock and outlet system. As shown, the tunnels have been plugged permanently, upstream from the point at which the useful outlets enter.

## Achievements

HOOVER DAM is an outstanding example of the Reclamation multiple-purpose project. Its benefits encompass the whole concept of river control: Protection from floods, water conservation for irrigation and other purposes, power generation, recreation, and preservation of fish and wildlife.

Standing as a bulwark in Black Canyon, Hoover Dam affords flood protection to the fertile valleys along the lower reaches of the Colorado River. Water stored in Lake Mead assures a stable supply for irrigation and domestic usage and, as the water is released through the powerplant turbines, it pays its toll by generation of electrical energy.

This water assures a dependable supply for irrigating some 750,000 acres now under cultivation in southern California and southwestern Arizona and over 400,000 acres in Mexico. With full development of presently authorized projects in Arizona and California, an additional 50,000 to 150,000 acres may be brought under cultivation. Here an all-year growing season produces a variety of crops, including fruits and vegetables which find their way to the dinner tables in sections of the United States still held in the icy grip of winter.

The All-American Canal, authorized as a part of the Boulder Canyon project, conveys water to some 530,000 acres in the rich Imperial Valley of California. About 74,800 acres in the equally rich Coachella Valley can receive water from the All-American's major branch, the Coachella Canal. When the Gila project is completed, the Gila Gravity Main Canal will serve 115,000 acres near Yuma, Ariz. In addition, thousands of acres on the Yuma project, the Yuma Auxiliary project, the Palo Verde Valley, and the Colorado River Indian Reservation near Parker, Ariz., are irrigated with Colorado River water.

With river flow stabilized, Parker Dam provides a forebay for diversion of water to 72 incorporated cities and to extensive, unincorporated areas in southern California.

Energy generated at Hoover Dam contributes to the industrial development of the Pacific Southwest. Today the Los Angeles area leads the Nation in the production of aircraft and oil-field equipment. It ranks second in automobile assembly and in the production of rubber goods.

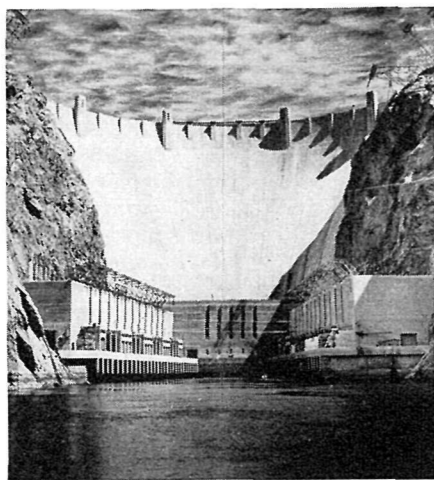
During World War II, the Hoover powerplant was one of the Nation's vital installations. Its generators supplied more than half of the energy for the war plants in southern California, southern Nevada, and Arizona.

With the end of hostilities in 1945, there was no lessening of energy demands. Today peace-time energy requirements have increased to values much greater than those of even war-time peaks.

The project has created a recreational area already attracting more than two million visitors a year. Under the supervision of the National Park Service, this inland playground is growing steadily in popularity.



Black Canyon in 1930



Hoover Dam today

## LAKE MEAD

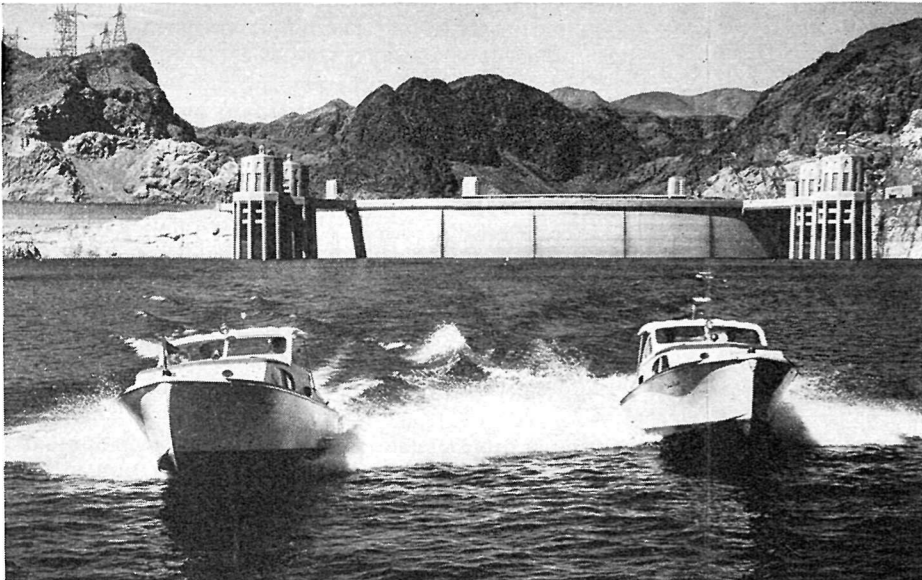
Lake Mead, the inland sea created by Hoover Dam, and its surrounding area are among the Nation's top attractions for recreationists.

The spectacular lake in its setting of magnificent canyons was named in honor of the late Dr. Elwood Mead, Commissioner of Reclamation from 1924 to 1936. Extending 115 miles upstream, its 550 miles of shoreline have made accessible scenic vistas which, prior to the construction of Hoover Dam, were all but closed to other than the most intrepid explorer.

The long summer season attracts visitors from all over the country for swimming, boat-

ing, surfing, and fishing. The lake is well supplied with large-mouth bass, bluegill, black crappie, channel catfish, and other species. There is no closed season, and recent estimates of fishing show an annual use in excess of 90,000 fisherman days, with a total catch of some 135,000 pounds of bass alone.

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



The clear waters of Lake Mead offer an alluring invitation to the recreationist

## RIVER FLOW

A large part of the water carried by the Colorado River results from the melting snowpack on the far-away Rockies. During the spring and early summer the river rises rapidly. A flow of 220,000 cubic feet of water a second has been recorded, and there is evidence of flows as great as 300,000 cubic feet a second. With a capacity of 31,100,000

acre-feet at the top of the spillway gates, Lake Mead can impound 2 years' average flow of the river. (An acre-foot is enough to cover one acre one foot deep.) Releases at Hoover and downstream dams are controlled to insure a stable water supply during each and every year.

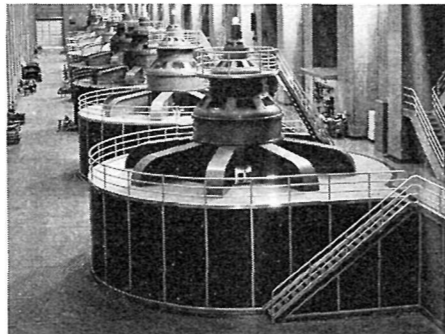
## IRRIGATION

Water is the lifeblood of the arid West. The region along the Colorado River below Hoover Dam receives no more than 5 inches of rain each year and, without irrigation, crop production is out of the question. With irrigation, hundreds of thousands of acres are in cultivation.

An all-year growing season and a stable water supply combine to make this section of the Nation one of its richest producers of vegetables and fruits. Field-scale production of lettuce, cabbage, carrots, other vegetables, and melons afford a variety of foodstuffs for family midwinter dinner tables in all parts of the country. Other specialty crops produced with a dependable supply of water for irrigation include dates, citrus fruits, and early table grapes. There are also large yields of alfalfa, barley, flax, cotton, and other field crops. With the hay and field crops produced annually, cattle and sheep are brought from arid range lands and fattened for markets.

Presently about three-fourths of a million acres of land are in irrigated farming in the Palo Verde Valley, on the Colorado River Indian Reservation about 200 miles downstream from Hoover Dam, on the Yuma and Gila projects another 100 miles downstream, and in the Imperial and Coachella Valleys in southern California.

Some lands in the lower Colorado River Basin were irrigated by pumping from underground sources. But continued use of these sources has lowered water tables to the extent that irrigated acreages are in jeopardy. This was true particularly on the Wellton-Mohawk division of the Gila project, in Arizona, and in the Coachella Valley, in California. Developments now under way on the Gila project will supply water for irrigating 115,000 acres of land on the project; and the Coachella branch of the All-American Canal assures a stable water supply for some 74,800 acres in the Coachella Valley.



Arizona wing of powerplant

## POWER

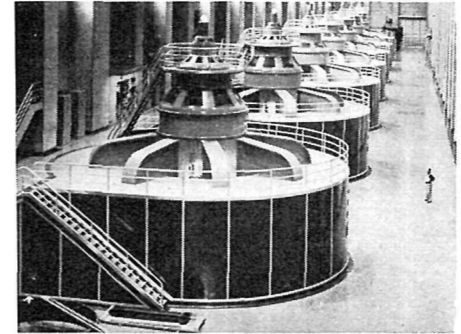
Hoover Dam is one of the world's largest producers of power. Energy generated at the Hoover powerplant, which is marketed at low cost, has been a boon to industrial expansion and has made living more comfortable in thousands of homes.

Hoover Dam power has been a major contributing factor in the rise of a great new industrial region in the Pacific Southwest, a region including some of America's most important aircraft, automobile, tire, textile, rubber goods, and chemical industries.

The powerplant is a U-shaped structure built against the downstream toe of the dam. Installed in the powerplant are 14 generators rated at 82,500 kilowatts each, one rated at 50,000 kilowatts, another at 40,000 kilowatts, and two rated at 2,400 kilowatts each. The last two are station service units. The total aggregate generator capacity of 1,249,800 kilowatts is driven by turbines totaling 1,742,000 horsepower. Space is reserved in the Nevada wing of the powerplant for an additional 104,500-kilowatt generator, to be driven by a 145,000-horsepower turbine. The installed capacity of the Hoover plant is sufficient to supply the normal domestic needs of 2 million persons.

The United States has executed contracts with both public and private agencies for disposal until 1987 of all firm and secondary energy generated at the plant. The firm energy output approximates 4 billion kilowatt-hours annually; and it has been estimated that an average of about 750 million kilowatt-hours of secondary energy will be available each year until 1987, which is the end of the amortization period.

The City of Los Angeles Department of Water and Power and the Southern California Edison Company operate the generating equipment under contract with the United States.



Nevada wing of powerplant

## GUIDED TOURS

The Bureau of Reclamation maintains guide service facilities at Hoover Dam. Guided tours are available daily between 8 a. m. and 5 p. m. Groups of visitors are conducted through the dam and powerplant, and explanatory lectures are given by tour leaders. In addition to the guided tour, an exhibit building, housing a model of a generating unit and a topographical model of the Colorado River Basin, is open to the public.

## POWER AND WATER PAY THE BILL

HOOPER DAM is a self-supporting and self-liquidating venture. The cost of the dam and powerplant is being repaid to the United States Government almost wholly through the sale of electrical energy. A small contribution toward repayment is being made through water storage charges.

Thus the project is an investment, from which the American people will benefit in many ways. Not only will the capital costs be repaid, but power and water necessary for the development of a rich area will be provided. The value of the production thus made possible will circulate to every part of the country. Federal

taxes alone on the wealth created by the dam will amount to many times the cost of the dam.

The cost of building the dam, powerplant, and appurtenant works is estimated at \$174,000,000, of which \$25,000,000 has been allocated to flood-control features.

Costs, other than the allocation to flood control, are being repaid with 3-percent interest within 50 years. Repayment of the flood-control cost has been deferred, without interest, until after May 31, 1987.

Commercial power production began in October 1936 and Hoover Dam returns to the Federal Treasury up to \$10,500,000 annually. Operation and maintenance cost, reserves for replacing project facilities, and amor-

tization of costs of generating facilities are all financed from revenues received.

The United States has contracted to furnish electrical energy from the project to the States of Nevada and Arizona, to the cities of Los Angeles, Pasadena, Burbank, and Glendale, and to the Metropolitan Water District of Southern California, the Southern California Edison Co., and the California Electric Power Co. It also supplies power to Boulder City, Nev.

Contracts for the sale of stored water from Lake Mead have been executed with the States of Arizona and Nevada and with a number of irrigation and water districts in California and Arizona.

## ALL-AMERICAN CANAL, A MAN-MADE RIVER, MAKES DESERT LANDS PRODUCTIVE

THE ALL-AMERICAN CANAL serves 530,000 acres of rich desert land in southern California's Imperial Valley, today one of the most productive areas in the world. Substantial acreages on the Yuma project, near Yuma, Ariz., are supplied from this canal. Another 74,800 acres of land, located in the Coachella Valley north of Imperial Valley and the Salton Sea, receive Colorado River water through the Coachella Canal, a branch of the All-American.

The All-American Canal System, approved in 1928 as part of the Boulder Canyon project and built by the Bureau of Reclamation, includes Imperial Dam and desilting works, the 80-mile All-American Canal, and the 123-mile Coachella Canal. The All-American Canal, which taps the Colorado River about 300 miles below Hoover Dam, was begun in 1934 and was in operation by 1940, in time to contribute materially to the Nation's record food production during World War II.

Imperial Dam is the diversion structure for the system. Its desilting works are designed to remove silt from all water entering the All-American Canal—a flow equal to that of a good-sized river. Of four potential power drops along the main canal, three are presently being utilized to generate electricity and Pilot Knob powerplant, adjacent to the canal, is also in service.

The All-American Canal with its load of clear blue water is an impressive sight as it winds southwestward across the desert from Imperial Dam to a point near the Mexican border. It swings to the west just north of the international boundary, crosses Imperial Valley, and comes to an end as it reaches the mesa lands on the other side. Part of this route is through a ridge of shifting sandhills, 10 miles wide, which challenged the utmost skill and ability of the engineers during



Imperial Dam and desilting works



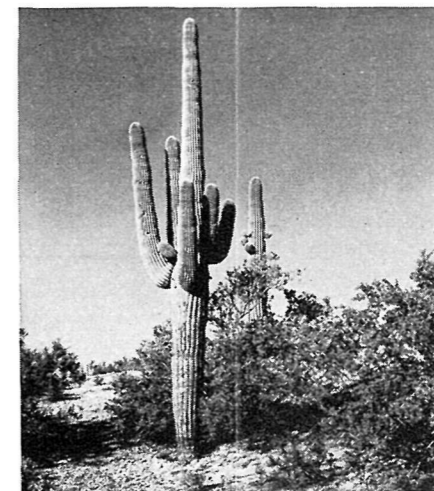
All-American Canal winds through sand hills

construction. Farmers who use water carried by the canal will repay the construction costs advanced by the Federal Government in interest-free installments over a period of years.

Today large fields of alfalfa, cotton, flax, sugar beets, lettuce, cantaloupes, and other crops are grown with the dependable water supply which storage at Hoover Dam makes possible. Nor do the farmers fear destructive floods such as occurred in 1905 when the uncontrolled Colorado swept over its banks, destroyed diversion canal headworks, and for 16 months poured its entire flow across the fertile Imperial Valley lands. Damage totaling millions of dollars was sustained. The Salton Sea was created which, with the New River Gorge also created by the rampaging waters, serves as a lasting reminder of the river's past menace.

Each winter lands irrigated by water from the Colorado supply large amounts of produce for the Nation's markets. The Imperial Valley and other lower Colorado River developments are among the few areas in America which enjoy a 12-month growing season. Because of irrigated lands such as these, a great many more Americans can eat green foodstuffs throughout the year at reasonable prices.

The All-American Canal supplying water to irrigated farms is one more example of man's ingenuity in enlisting nature's resources as he progresses toward more abundant living. The old Alamo Canal, which loops through Mexico, formerly supplied Colorado River water to lands on both sides of the border. Since the completion of the All-American Canal, the Alamo has supplied water solely to lands in Mexico. By terms of the 1944 water treaty between the United States and Mexico, the latter country receives some water from the All-American Canal at certain seasons of the year.



From arid desert . . .



. . . to flourishing fields

## BOULDER CITY

Boulder City, Nev., first a construction camp for the workers who built Hoover Dam and later used as operating headquarters, today is a man-made oasis symbolic of Reclamation.

Located on a hill 7 miles southwest of the dam, the town has a population of about 4,000 persons. It is an attractive community with tree-lined streets, spacious parks, schools, churches, homes, and thriving business establishments.

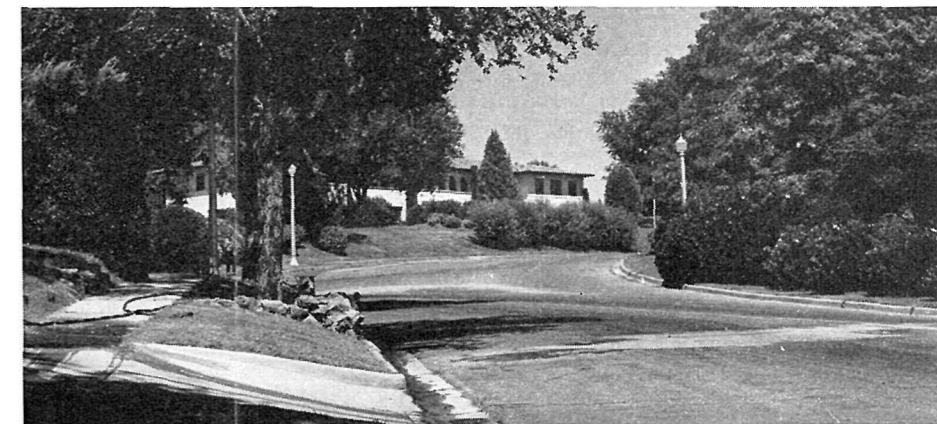
Modern conveniences were planned for Boulder City from the very beginning. The town site was leveled and landscaped, and a water system which included a modern treatment plant was provided. Sewerage and lighting systems were installed. Houses were built for rental to those employed in construction of the dam.

Those who planned the town recognized that high desert temperatures posed a problem, and all permanent dwellings were designed to afford maximum comfort during

the long summers. At present all buildings are artificially cooled. Winters are short and mild, and most homes are heated by electricity.

All land in the town is owned by the Government, and lots are leased to homeowners or those who have been granted business permits. Supervisory control of the city remains with the Bureau of Reclamation, and land rent is collected from lessees instead of real estate taxes. However, each lessee is required to pay leasehold taxes.

After the dam was completed, the city grew steadily into a permanent community. In 1951, the Secretary of the Interior ordered that steps be taken to separate the city from the Boulder Canyon project and bring about its eventual incorporation under the laws of Nevada. A city manager was appointed in the spring of 1952 and an advisory council was organized to assist in community affairs.



Boulder City, oasis of the Western desert, is one of America's most modern towns

## DOMESTIC WATER

Because Hoover Dam regulates the flow of the Colorado River, the Los Angeles and San Diego metropolitan areas are assured a stable supply of water for domestic and industrial use.

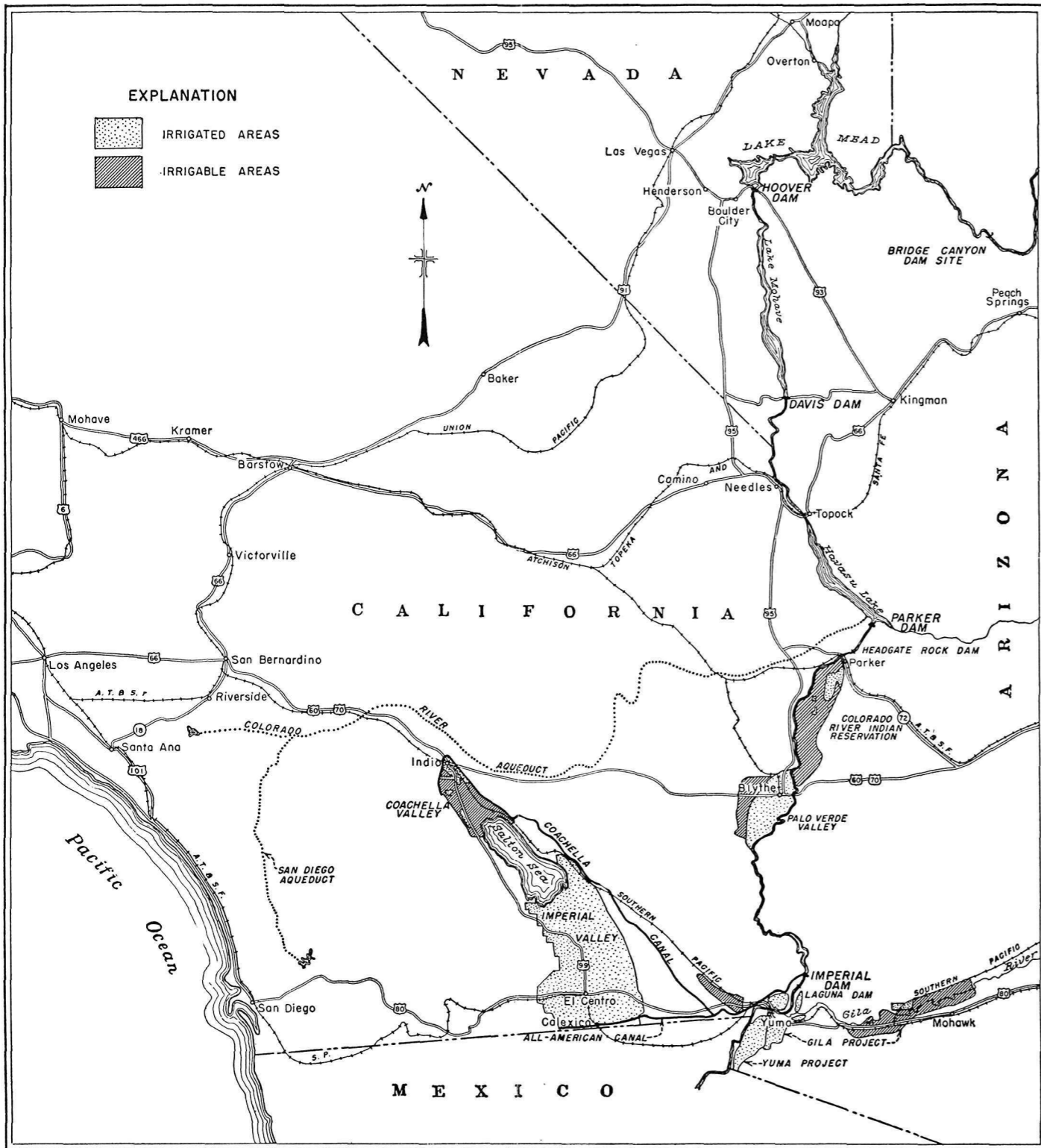
The Colorado River aqueduct, built and operated by the Metropolitan Water District of Southern California, transports water from Havasu Lake, the reservoir created by Parker Dam 155 miles below Hoover Dam, to the southern California coastal plain. Without

this water, the vast industrial development and population expansion of this area during the past decade might not have been possible.

The San Diego aqueduct, designed by the Bureau of Reclamation, taps the Colorado River aqueduct and delivers water to the San Diego water supply system. The Department of the Navy constructed the first barrel of the aqueduct in 1945-46. The second barrel was completed by the Bureau of Reclamation early in 1955.



Controlled water disposal prevents floods

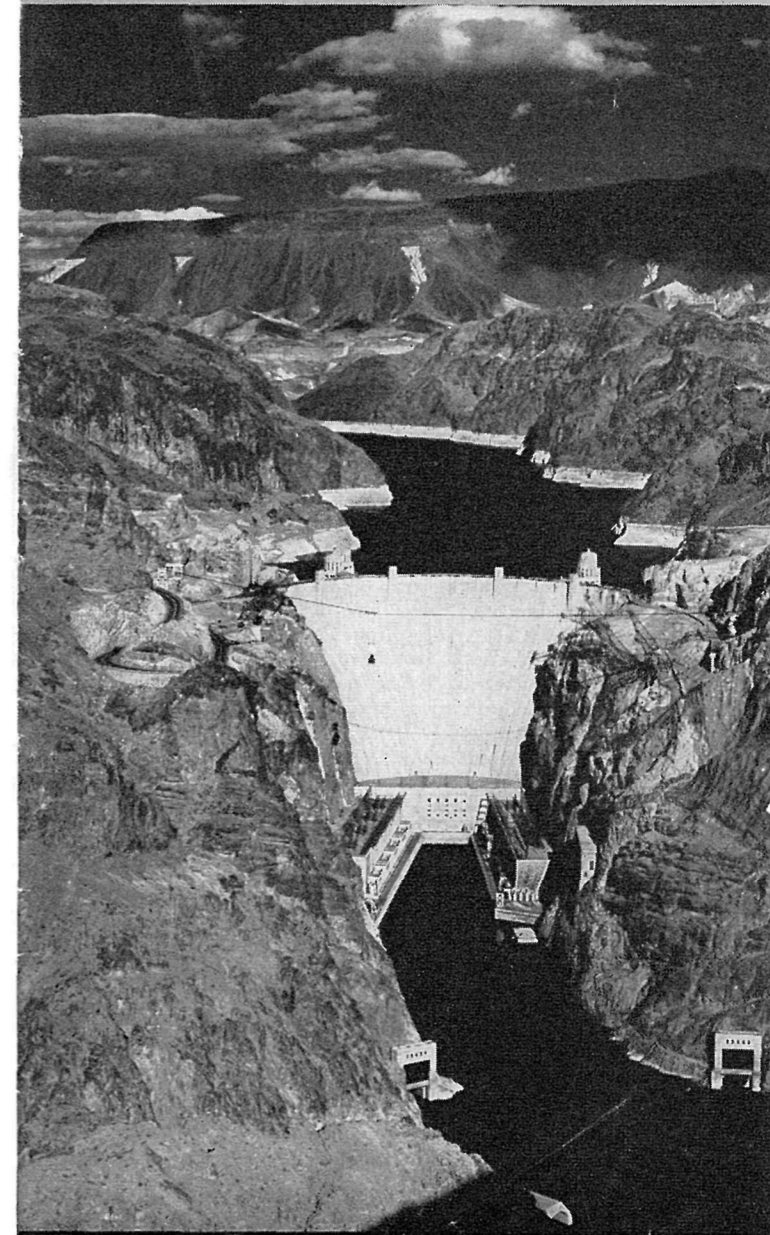


## You will want to know that . .

- Hoover Dam is the highest dam in the Western Hemisphere.
- Lake Mead is the world's largest man-made reservoir, by volume.
- Elevators descend from the dam's crest 528 feet, equal in height to a 44-story building.
- Maximum water pressure on the dam's base is 45,000 pounds per square foot.

Hoover Dam 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.
Concrete content of dam.....	3,250,000	cubic yards.
Lake Mead when full is.....	115	miles long.
Its capacity is.....	31,100,000	acre-feet.
Flood-control reserve.....	9,500,000	acre-feet.
Maximum depth.....	589	feet.
Lake Mead at maximum elevation covers.....	163,000	acres.
Powerplant capacity ultimately.....	1,354,300	kilowatts.
Number of large generators.....	17	
One rated at ( <i>future</i> ).....	104,500	kilowatts.
14, each rated at.....	82,500	kilowatts.
One rated at.....	50,000	kilowatts.
One rated at.....	40,000	kilowatts.
Station service generators.....	2	
Each rated at.....	2,400	kilowatts.
Number of large turbines.....	17	
One rated at ( <i>future</i> ).....	145,000	horsepower.
14, each rated at.....	115,000	horsepower.
One rated at.....	70,000	horsepower.
One rated at.....	55,000	horsepower.
Station service turbines.....	2	
Each rated at.....	3,500	horsepower.
Spillways.....	2	
Capacity of each.....	200,000	cu. ft. a second.
Drum gates each.....	100 by 16	feet.
Spillway tunnels.....	2	
Diameter of each.....	50	feet.
Intake towers are.....	395	feet high.
Diameter of each.....	75	feet.
Capacity of outlets (tunnel plugs and canyon wall).....	90,000	cu. ft. a second.
Excavation totaled.....	6,480,000	cubic yards.
Steel and metal used.....	96,000,000	pounds.
Valves, gates, hoists.....	33,000,000	pounds.
Steel in penstocks.....	89,000,000	pounds.
Total concrete.....	4,360,000	cubic yards.

# HOOVER DAM



UNITED STATES DEPARTMENT OF THE INTERIOR

Fred A. Seaton, Secretary

Bureau of Reclamation, W. A. Dexheimer, Commissioner

# LAKE MEAD MARINA

Hemenway Beach  
Boulder City, Nevada  
Phone 24 or 72

HOOVER DAM TRIPS:.....1 Hour Trip  
10:30 A.M. — 1:30 P.M. — 3:30 P.M.

Adults — \$1.75                      Children — \$ .75

SPECIAL SPEEDBOAT RIDES to Hoover Dam — Anytime  
\$1.75 Adults, .75 Children — Minimum \$7.00

CHARTER TRIP TO BOULDER CANYON:.....3 Hour Trip  
Boulder Canyon — Wishing Well  
Daily 1:00 P.M.                      Monday thru Friday

CHARTER BOATS:.....Large Cruisers with Pilot  
5 Hours.....\$ 50.00  
10 Hours.....80.00  
24 Hours.....120.00  
Subsequent 24 Hour Periods.....100.00

SPEEDBOATS FOR WATER SKIING:.....Century Cornado  
Per Hour — \$15.00 (including 1 pair skis, line and life belt)  
Ski (including line — per hour.....\$1.00

## R E N T A L S

Johnson Outboard Motors and Boats for rent.

<b>BOAT ONLY</b>	<b>16 FOOT</b>
1 Hour	\$ 1.50
To 5 Hours	5.00
To 10 Hours	8.00

### 5 HORSEPOWER OUTBOARDS:

1 Hour	2.50
To 5 Hours	9.00
To 10 Hours	14.00

### 10 HORSEPOWER OUTBOARDS:

1 Hour	3.50
To 5 Hours	11.00
To 10 Hours	18.00

### 25 AND 30 HORSEPOWER OUTBOARDS:

1 Hour	5.00
To 5 Hours	15.00
To 10 Hours	25.00

ALL RATES SUBJECT TO CHANGE

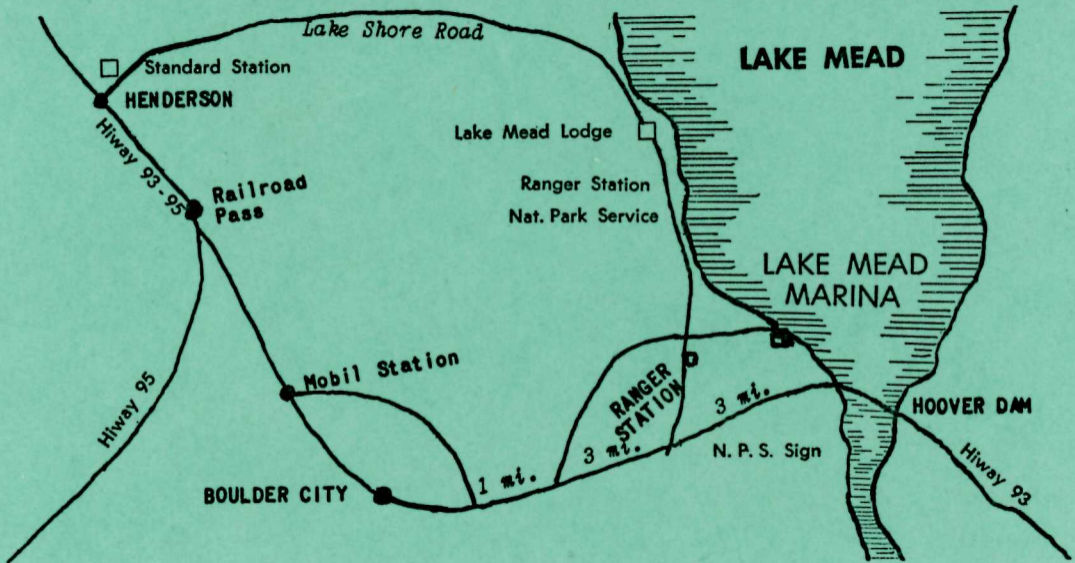
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BAIT AND TACKLE — FISHING LICENSES — LUNCH STAND

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## National Recreation Area

See Reverse for Map



*Lake Shore Road*

Standard Station  
**HENDERSON**

Hiway 93-95  
**Railroad Pass**

Lake Mead Lodge  
Ranger Station  
Nat. Park Service

**LAKE MEAD**

**LAKE MEAD MARINA**

Hiway 95

**Mobil Station**

**BOULDER CITY**

1 mi.

**RANGER STATION**

3 mi.

3 mi.

N. P. S. Sign

**HOOVER DAM**

Hiway 93