The Colorado River Storage Project
and participating projects

UNITED STATES DEPARTMENT OF THE INTERIOR
Bureau of Reclamation, W. A. Dexheimer, Commissioner
The Colorado River storage project was authorized by the Congress in legislation which was signed into law by President Eisenhower on April 11, 1956.

This law (P.L. 485, 84th Cong.) provides for the development of the water resources of the Upper Colorado River Basin, an area which has been described as the "last water-hole" of the West.

The Upper Colorado River Basin, covering parts of Utah, Wyoming, Colorado, New Mexico, and Arizona, is an area of approximately 110,000 square miles between the high crests of the Rocky Mountains in Colorado and Wyoming, and the Wasatch Mountain spur in Utah. The southern portion drains a part of New Mexico and Arizona through the San Juan River.

The area contains a scarcely tapped potential of agricultural, industrial, and recreational assets. It contains tremendous quantities of uranium, coal, and other minerals. Realization of the potential in economic growth and contribution to the national welfare is dependent on maximum utilization of limited water supplies. The Colorado River storage project is planned to conserve the very limited precipitation which falls principally in the form of snow in the high mountains and utilize it for municipal, industrial and agricultural growth.
The need for the Colorado River storage project was envisioned by the Colorado River Compact of 1922. In dividing Colorado River water between the Upper and Lower Colorado River Basins, the compact permits the Upper Basin to consume 7 1/2 million acre-feet of water each year. However, this allocation is contingent upon the Upper Basin delivering to the Lower Basin not less than 75 million acre-feet of water in any period of 10 consecutive years and to deliver additional water for use in Mexico under certain circumstances. The dividing point between the two basins is at Lee Ferry near the northern border of Arizona.

Water allocated to the Upper Basin was further apportioned to the individual States of Arizona, Colorado, New Mexico, Utah, and Wyoming by the Upper Colorado River Basin Compact of 1948. This compact also created the Upper Colorado River Commission, consisting of representatives of the Federal Government and each compacting State except Arizona.

The flow of the Colorado River is extremely erratic, varying from 4 million to 22 million acre-feet annually at Lee Ferry. There is a tendency for the high years and the low years to be grouped, thus accentuating problems of river regulation and use.

In prolonged dry periods there is not enough water to permit the Upper Basin to consume its allotment under the 1922 compact and at the same time make the required deliveries to the Lower Basin. In wetter periods, however, flows are more than sufficient for these purposes.

Large storage reservoirs thus are needed to be filled when flows are high and to provide additional water when needed for compact fulfillment. Favorable opportunities for such reservoirs are provided by the deep canyons of the Colorado River and its principal tributaries in the Upper Basin.

A plan for the Colorado River storage project, including a series of dams and reservoirs to provide storage capacity in combination with power developments and other services, was presented in a Bureau of Reclamation report in 1950, which was subsequently printed as H. Doc. No. 364, 83d Congress, 2d session. The plan had been formulated in cooperation with other Federal agencies and with the Upper Colorado River Commission.

An initial group of "participating projects" that would develop water for irrigation and other purposes in the Upper Basin and that would be linked financially with the storage project was also presented in the 1950 report.

**PROJECT AUTHORIZATION**

Construction of four storage units of the Colorado River storage project and 11 participating projects was authorized by the act of April 11, 1956 (P. L. 485, 84th Cong.). Authorized developments are listed below.

**STORAGE PROJECT UNITS**

- Glen Canyon Unit on the Colorado River in Arizona and Utah.
- Flaming Gorge Unit on the Green River in Utah and Wyoming.
- Navajo Unit on the San Juan River in New Mexico and Colorado (dam and reservoir only).
- Curecanti Unit on the Gunnison River in Colorado (subject to further engineering and economic investigations and to a limitation on the height of the principal dam of the unit).

**PARTICIPATING PROJECTS**

- Central Utah (initial phase), Utah.
- Emery County, Utah.
- Florida, Colorado.
Hammond, New Mexico
La Barge, Wyoming.
Lyman, Wyoming.
Paonia, Colorado (works additional to existing project).
Fine River Extension, Colorado and New Mexico.
Seedskadee, Wyoming.
Silt, Colorado.
Smith Fork, Colorado.

In the investigations of additional developments in the Upper Basin, twenty-five additional potential participating projects are to receive priority consideration in the completion of planning reports. It is not the intent of Congress, however, to interfere with or preclude consideration and authorization of other additional projects in the comprehensive plan of development.

None of the authorized dams or reservoirs will be constructed within any national park or monument. Appropriations, not to exceed $760,000,000, were authorized to carry out the purposes of the act. This is the largest expenditure ever authorized for a Reclamation development at one time.

The Eden project in Wyoming, which is now largely constructed, would, by terms of its authorizing act of June 28, 1949, become financially related to the Colorado River storage project as a participating project.

**CONSTRUCTION FEATURES**

Storage project units

The four authorized storage units will provide about 32,000,000 acre-feet of reservoir capacity and about 1,100,000 kilowatts of installed generating capacity. About 80 percent of both capacities will be provided by the Glen Canyon Unit alone. When completed, Glen Canyon Dam will be the fourth highest dam in the world, and second in height only to Hoover Dam in the United States. The units are described below. Modifications in some of the designs may result from the definite plan studies that will precede construction.

**Glen Canyon Unit**

Glen Canyon Dam will be on the Colorado River in northern Arizona, about 13 miles downstream from the Utah-Arizona State line and 16 miles upstream from Lee Ferry, the dividing point between the Lower and Upper Basins. It is the only one of the authorized dams that will be on the Colorado River proper.

Glen Canyon Dam is planned as a concrete arch structure that will extend about 700 feet above its foundation. It will have a crest length of 1,400 feet. When the 26,000,000 acre-foot reservoir is full, the water surface area will cover about 153,000 acres and will extend 186 miles up the Colorado River, or nearly to the mouth of the Green River, and 71 miles upstream on the San Juan River. About 6,000,000 acre-feet of the reservoir capacity will be below the outlet level. This “inactive” capacity will be useful for sediment accumulation, to protect fish, and to increase the power head at the dam.

During construction, the river will be diverted through two concrete tunnels, each of which will be about 45 feet in diameter. One will be located on each side of the canyon. The lower portion of each tunnel will serve as a spillway tunnel when the dam is completed.

The powerplant to be constructed at the toe of the dam will house seven generating units having a total installed capacity of 800,000 kilowatts.

Measures will be taken to protect the Rainbow Bridge national monument at the upper reaches of the reservoir.

**Flaming Gorge Unit**

The Flaming Gorge Unit will be at the Ashley site on the Green River, a major tributary of the Colorado, in northeastern Utah about 6 miles south and 20 miles west of the corner common to Utah, Wyoming, and Colorado. A concrete arch dam rising about 495 feet above the foundation and about 450 feet above the river will be constructed. The reservoir will have a capacity of about 4,400,000 acre-feet and an area of about 44,000 acres. It will extend upstream 94 miles, nearly to the town of Green River, Wyo. About 1,900,000 acre-feet of the reservoir capacity will be below the outlet level.

A powerplant at the Flaming Gorge Dam will have an installed capacity of 85,000 kilowatts.

**Curecanti Unit**

The Curecanti Unit will develop storage and power possibilities along part or all of a 35-mile stretch of a deep canyon section of the Gunnison
River above the Black Canyon and below the town of Gunnison, Colo.

In order to prevent the inundation of property near the town, the authorizing legislation provides that "* * * the Curecanti Dam shall be constructed to a height which will impound not less than 940,000 acre-feet of water or will create a reservoir of such greater capacity as can be obtained by a high waterline located at 7,520 feet above mean sea level * * *." The act also requires that construction shall not be undertaken until further engineering and economic investigations have been made and until the Secretary of the Interior has certified to the Congress and the President that in his judgment the benefits of the unit will exceed its costs.

Bureau of Reclamation reconnaissance studies indicate that a favorable plan, consistent with the authorizing act, would include a series of three or four dams, reservoirs, and powerplants along the 35-mile river section. Collectively these powerplants, with an installed generating capacity of about 152,000 kilowatts, would develop about 970 feet of static power head in this section of the river.

The Curecanti Reservoir, uppermost of the series, would be formed by the Blue Mesa Dam, located 30 miles downstream from Gunnison. A dam 350 feet high above its foundation would create a reservoir with a capacity of about 940,000 acre-feet at a high water elevation of 7,520 feet. The reservoir would provide the principal seasonal river regulation for a powerplant at the Blue Mesa site and for powerplants at other dams in the 15-mile section of the river below the Blue Mesa site.

Investigation and planning of the Curecanti Unit will continue in more detailed scope as required by the act.

Navajo Unit

An earth-filled dam will be constructed on the San Juan River in New Mexico, about 34 miles east of Farmington. The dam will rise about 370 feet above its foundation and extend about 6,100 feet in length at its crest. It will create the Navajo Reservoir with a total capacity of 1,450,000 acre-feet, of which about 780,000 acre-feet will be active or available for stream regulation. Sediment accumulation in the reservoir will be fairly heavy and is expected to amount to about 330,000 acre-feet over a 100-year period, most of the sediment being deposited in the inactive section of the reservoir. The reservoir, when full, will inundate 13,500 acres and will extend approximately 35 miles up the San Juan River. No powerplant is planned for the Navajo Unit.

Participating Projects

The eleven participating projects authorized by Public Law 485 plus the Eden project will be assisted financially by the storage project. Participating projects are those which will consume water of the Upper Colorado River system for irrigation and other purposes and will require repayment assistance on irrigation costs from power revenues of the storage project.

These participating projects will provide water to irrigate over 130,000 acres of presently dry land and supply water to about 230,000 acres of land presently irrigated.

Central Utah

The Central Utah project (initial phase) will be constructed in east-central Utah and in the Uinta River Basin, a tributary of the Colorado in northeastern Utah. This multiple-purpose project will provide irrigation water to about 28,540 acres of new land, a supplemental supply for about 138,210 acres, and furnish about 49,000 acre-feet of municipal water.

Principal features of construction are Strawberry aqueduct, Strawberry Reservoir enlargement by construction of Soldier Creek Dam, four powerplants with combined installed capacity of 61,000 kilowatts, and other regulating reservoirs, aqueducts, canals, and distribution systems. The initial phase of the comprehensive development of this project will also provide some flood control, recreation and forest resource development.

Emery County

The Emery County project is in the headwaters of the San Rafael River in east central Utah. Its construction will primarily improve irrigation water supply for 20,450 acres of irrigated land, supply water for about 3,630 acres of new land, and provide for recreation opportunities. The Joes Valley Dam and Reservoir with total capacity of 57,000 acre-feet, a diversion dam, canal, laterals and drains, are the principal features of the project.
Florida

In southwestern Colorado on the Florida River, development of the Florida project will include construction of the Lemon Reservoir to a capacity of over 23,000 acre-feet, a diversion dam and enlargement of an existing canal, and a distribution system. These works will provide supplemental water to about 12,650 acres and full supply to about 6,300 acres of land. Operation of the project will also provide flood control and some enhancement in fish and wildlife values in the area.

Hammond

The Hammond project in northwestern New Mexico will divert San Juan River waters for irrigation of about 3,670 acres of arable land along the rivers in the vicinity of Farmington and Bloomfield. Principal features of this single-purpose development are a diversion dam, main canal, pumping plant, lateral and drainage systems.

LaBarge

Diverting water directly from the Green River, the LaBarge project in southwestern Wyoming will provide irrigation water for about 7,970 acres of desert land extending 40 miles along the river above LaBarge. Project works will include a diversion dam, conveyance canal, distribution laterals and drains.

Lyman

The Lyman project in southwestern Wyoming along Black's Fork of the Green River near the Wyoming-Utah boundary will supplement an irrigation water supply for about 40,000 acres of land having only a partial supply. Bridger Reservoir will be constructed with 43,000 acre-feet total capacity on Willow Creek and other features will include feeder canals to the reservoir, drainage and improvements to the existing irrigation system.

Paonia

The existing authorized Paonia project on the North Fork of Gunnison River in westcentral Colorado would be extended by this reauthorization. Irrigation water supply will thus be improved for an additional 4,380 acres of irrigated land and a full water supply provided for about 1,160 acres more of arable land. Fish and wildlife values in the area will be enhanced and flood damages will be decreased. Project construction includes Spring Creek Reservoir, canal enlargements and extensions.

Pine River Extension

Extension of the existing Pine River project in southwestern Colorado and northwestern New Mexico on Pine River about 20 miles east of Durango, Colo., will provide water for irrigation of about 15,150 acres of arable land, of which about 1,940 acres are within the Pine River Indian irrigation project. Project extension will involve enlargement and extension of eight major canals and ditches diverting from Pine River, a new diversion dam, and several small distribution laterals.

Seedskadee

The Seedskadee project will be constructed in southwestern Wyoming along the Green River below the authorized LaBarge project. Principal works will include a diversion dam on the river, conveyance canals, pumps, and distribution laterals. Such work will provide an irrigation water supply for about 60,720 acres of arable land.

Silt

An improved water supply for over 5,400 acres of partially irrigated land and a full supply for about 2,270 acres of new land will be provided by construction of the Silt project between Rifle and Elk Creeks in west-central Colorado. Construction features include the Rifle Gap Reservoir of 10,000 acre-feet capacity, a pumping plant, diversion dam and feeder canal, rehabilitation of existing works, and construction of laterals and drains.

Smith Fork

The Smith Fork project will be constructed in west-central Colorado along the Smith Fork of Gunnison River near Crawford. A supplemental water supply for more than 8,160 acres of partially irrigated land and a full irrigation supply for more than 2,270 acres of new land will be provided by the project. Construction features include the Crawford Reservoir with 14,000 acre-feet capacity, diversion dam, feeder canals and laterals. Recreation opportunities will also be provided by the project.
In carrying out further investigations of projects in the Upper Colorado River Basin the Secretary of the Interior is directed to give priority to completion of reports on the following participating projects: Gooseberry, Utah; San Juan-Chama and Navajo, New Mexico; Parshall, Troublesome, Rabbit Ear, Eagle Divide, San Miguel, West Divide, Bluestone, Battlement Mesa, Tomichi Creek, East River, Ohio Creek, Fruitland Mesa, Bostwick Park, Grand Mesa, and Dallas Creek, Dolores, Fruitgrowers Extension, and Yellow Jacket, in Colorado; Savery-Pot Hook, Colorado and Wyoming; Animas-LaPlata, Colorado and New Mexico; and Sublette, Wyoming. Concurrently, priority will be given to completion of the report on the Juniper project in Colorado.