

THE  
CONTROVERSY BETWEEN ARIZONA AND CALIFORNIA  
OVER THE  
BOULDER CANYON PROJECT ACT

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A Thesis  
Presented to the Department of History  
University of Southern California

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In partial fulfillment  
of the  
Requirements for the  
Degree of Master of Arts

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By  
Winifred Isabella Smith

May 18, 1931

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*This thesis, having been approved by the  
special Faculty Committee, is accepted by the  
Council on Graduate Study and Research  
of the University of Southern California,  
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for the degree of.....Master of Arts.....*

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## CHAPTER I

### INTRODUCTION

The Colorado River is of vital importance in the development of the Southwest. There have been many explorations and surveys of this river, and men have seen the tremendous possibilities that are offered in the matter of water-power, hydro-electric power, and irrigation. The present day sees the dreams of these men coming true, and the developments contemplated by the government will change this part of the country, forbidding desert, to a land of homes and prosperity.

None of the early explorers appears to have envisioned the main Colorado as furnishing water for any extensive scheme of land reclamation. The key to the problem of taming the Colorado and making a faithful servant of it, was found with the discovery of practicable long-distance electrical transmission toward the end of the 19th century. After that hydro-electric development and irrigation went hand in hand.<sup>1</sup>

The Secretary of Interior, Ray Lyman Wilbur, in a radio address delivered on February 6, 1930, aptly stated the problem of controlling the Colorado River:

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<sup>1</sup>Lewis R. Freeman, The Colorado River, 369.

As we look at many of the more difficult problems of the West to-day we find that they involve millions of people and are regional in character. The checkerboard of political units placed over the continent often is a handicap rather than an advantage in trying to handle these great regional resources. Streams bringing necessary water for the irrigation of vast tracts of lands often rise high up in the mountains of distant States. We can drop the stream over artificial waterfalls and make power; we can hold the water back, and where gravity permits it, bring life to settlements through irrigation. But the higher the mountain, the greater the elevation, the less suitable is the climate for those forms of vegetable life most productive of income when brought under control. The political units of all the low valleys have the greatest opportunity to develop wealth, but the development of that wealth is dependent upon the resources of the distant hills. This brings about conditions which demand the regional handling of the great physical problems associated with the settlement of the West. Inevitably we have a conflict of the interests of political units in the use of available regional resources.

In the development of the plans for the erection of a great dam in the Colorado River at Black Canyon, the so-called Boulder Dam, seven States are vitally interested. The water-shed of the Colorado brings in the States of Wyoming, Utah, Colorado, New Mexico, Arizona, Nevada, and California. As the water flows down the hills of the so-called four upper basin States it becomes of increasing value to the so-called three lower States--Nevada, California, and Arizona. The Boulder Dam Act is the first great attempt in this federation of States to bring together seven States as political units for the development, control, and management of the regional river in which they are all interested. Since this is but the beginning of a whole series of similar agreements or compacts between States which must be made if we are to wisely advance the welfare of the citizens of our States, it is of great consequence that this particular project should succeed.<sup>2</sup>

On March 17, 1924, Dr. Hubert Work, in reporting on the Colorado River Project said:

The Colorado River has been under observation, survey, and study, and the subject of reports to Congress since

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<sup>2</sup>Ray Lyman Wilbur, Extract from radio address, February 6, 1930, New Reclamation Era, March, 1930.

the close of the Civil War. More than \$350,000 have been expended by the Bureau of Reclamation since the Kinkaid Act of May 18, 1920. More than \$2,000,000 have been expended by other agencies of the Government. The time has arrived when the Government should decide whether it will proceed to convert this natural menace into a national resource.<sup>3</sup>

The Federal Government has made a careful study of the control of the Colorado River. Mr. E. Weymouth, who for years was chief engineer of the United States Reclamation, makes the following statement:

Investigations of the Colorado River Basin were started by the Reclamation Service in 1904, with a view of augmenting the water supply for irrigation in the Delta region. Extended investigation of the Upper Basin indicated a lack of the requisite storage at a reasonable cost; therefore, studies of storage sites in the lower river were undertaken. After a preliminary study of the problem and a reconnaissance of the river below the mouth of the Virgin River, work was concentrated, in 1919 and thereafter, on the better dam sites in the Boulder and Black Canyon.<sup>4</sup>

As early as January 12, 1907, President Roosevelt submitted to Congress a message upon the problems of the lower Colorado River, in which he outlined and urged a development which will become a reality upon the completion of the project. Thus he said:

The construction work required would be: The main canal, some 60 miles in length, from Laguna Dam into the Imperial Valley; the repair and partial construction of the present

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<sup>3</sup>United States, 68 Cong., 1st Sess., House Misc. Doc. No. 2903, 918.

<sup>4</sup>Frank E. Weymouth, Proceedings of American Society of Civil Engineers, No. 9, November 1924, 1484-1485.

distribution system in the valley and its extension to other lands, mainly public; diversion dams and distribution systems in the Colorado River Valley, and provision for supplementing the natural flow of the river by means of such storage reservoirs as may be necessary. This would provide for the complete irrigation of 300,000 acres in the Imperial Valley and for 400,000 acres additional in the United States in the valley of the Colorado in Arizona and California.<sup>5</sup>

For our earliest knowledge of the river we now call the Colorado we are about equally indebted to the Spanish conquistadores and the Spanish padres. As commerce follows the flag in world expansion of the present day, in the fifteenth and sixteenth centuries it was the Cross that followed the Sword. It fell to the conquistador to find and to establish temporal power; to the padre to consolidate spiritually. Possibly because the priest received and set down his impressions under conditions more nearly normal than did the soldier, it was he who left us more dependable records.

It is impossible to name a date when the history of the Southwest began. Neither do we know the origin of the earliest inhabitants. We do know that long before Columbus first sighted a new continent there existed in Arizona a race of people who were highly civilized--more so than any other race north of Central Mexico. These people were cliff-dwellers who climbed down from their mountain homes of rock or adobe to cultivate the fertile valleys. Probably they were always on guard against savage enemies. Their houses seem to have been more

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<sup>5</sup>Theodore Roosevelt, Message to Congress, January 12, 1907.

forts than homes. They could only be entered by a ladder that could be let down from the second story to the ground floor. Some of the houses seem to have been centuries old, perhaps the oldest constantly used dwellings of this continent.

Hubert Howe Bancroft has stated that this region offers for antiquarian research a field not surpassed, in several respects, by any in America:

Here only we find a people, far in advance of the savage tribes if far behind the highest types, retaining many of their original characteristics, and living on the same sites, in buildings similar to, or in several instances perhaps identical with, those occupied by their ancestors at the coming of the Europeans, and for centuries before. These are the oldest continuously inhabited structures on the continent; and these Pueblo Indians--so called from the Spanish term applied to community-houses, or towns, in the absence of any general aboriginal name--are probably more nearly in their original condition than any other American tribes.<sup>6</sup>

No successive narrative of the early Southwest is extant. The data we have, which has been collected by Bancroft and others, is incomplete, but enough is known to justify the assertion that when the Spaniards, under Coronado, first entered the country, nearly four hundred years ago in search of the seven cities of Cibola, they found upon the desert sufficient evidence of an extinct race to prove that the land was once densely populated by an agricultural and prosperous people. When or how these inhabitants disappeared is unknown and may never

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<sup>6</sup>Hubert Howe Bancroft, History of Arizona and New Mexico, 2.

be found. It is even in doubt as to whom they were, but presumably, they were of the Aztec or Toltec race; or perhaps of some civilization even more remote.

As soon as the Spaniards had conquered Mexico they began to think of the unexplored north country where it was said there were cities containing great riches. Cortez and his rival Nuño de Guzmán made a number of exploring trips, slowly moving northward. They never found the fabled cities, but in 1539, they crossed into the region of the Colorado River.

Thus it was that the Spanish Pioneers moved northward:

As Mexico became more and more thickly dotted with Spanish settlements, the attention of the restless world-finders began to wander toward the mysteries of the vast and unknown country to the north. Cortez was still captain-general when Cabeza de Vaca came into the Spanish settlements from his eight years' wandering, with news of strange countries to the north.<sup>7</sup>

While there was no immediate advantage to the Spanish Crown in the discovery of gold and silver, yet the expedition of Coronado was not unfruitful in ultimate results, for it extended the Spanish domain in the New World over a very wide area of country, extending north to the boundary line of Nebraska, south to within a hundred miles of Austin, Texas, all of New Mexico, and a portion of Colorado.

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<sup>7</sup>Charles F. Lummis, The Spanish Pioneers and the California Missions, 78.

One of the most important expeditions was conducted by Coronado, in 1540:

The land expedition under Coronado, which was one of the most completely and splendidly equipped forces which up to that time had been organized in New Spain, advanced in the spring of 1540; in two sections from Culizcan to the upper Rio Grande pueblos in northern New Mexico, and Arizona. In route a settlement was established at San Hieronimo in present Sonora, from where Melchior Diaz, as commander, explored to the mouth of the Colorado River and across that stream into present California. The Zuni pueblos in western part of New Mexico were conquered; and exploring expeditions were made to the Moqui pueblos in northeastern Arizona, and to the Grand Canyon of the Colorado.<sup>8</sup>

The Colorado River was discovered as early as 1539. Hernando de Alarcón was sent in command of a naval expedition; he proceeded from Acapulco up the Gulf of California. Later he sighted the river and followed it up in boats for some distance, perhaps beyond the junction of the Gila River. This expedition settled the point that California was a peninsula and not an island.

Another expedition by sea, fitted out by Mendoza to cooperate with that of Coronado on the land, was that of Hernando de Alarcón. Alarcón made two trips in boats up the Colorado River, which he named the Buena Guia. He possibly passed the mouth of the Gila, though he mentions no such branch; and it may be regarded as probable that he at least passed the Arizona line. This party also heard reports of Cibola, and of Niza's adventures; and near the mouth of the Colorado they left

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<sup>8</sup>Charles Wilson Hackett, Historical Documents Relating to New Mexico, Nueva Vizcaya, and Approaches Thereto, to 1773. Vol. I, 12.

letters, which were found a little later by the branch of Coronado's expedition under Melchor Diaz.<sup>9</sup>

While Coronado was at "Granada," detachments of his army were penetrating other sections of the new country:

Melchior Diaz, one of Coronado's ablest scouts, was trying to make junction with Alarcon's ships. Diaz touched the Colorado River some distance above its mouth. He found letters left by Alarcon, and met the giant Yuma Indians--perhaps in the vicinity of the city of Yuma, where the Gila River empties into the Colorado. These Indians were then as now of unusual height and powerfully made, so that one man could lift a log which several Spaniards could not move. They were naked and in cold weather carried fire-brands to keep them warm. So Diaz called the Colorado Rio del Tizon, or Firebrand River.<sup>10</sup>

One of the earliest explorers in Arizona was Juan de Oñate, the colonizer and founder of New Mexico. His family were very wealthy and owned rich mines in the territory of Mexico. Oñate was remarkable not only for his success in colonizing a country but also as an explorer. In 1604, on a western expedition, his party crossed a great river, known to be the Colorado:

Ten leagues to the westward they crossed a river flowing from the south-east to the north-west, named Rio Colorado from the color of its water, and said to flow into the sea of California after a turn to the west, and a course of 200 leagues through a country of pines. This was the stream still known as the Colorado Chiquito, and it is likely that this was the origin of the name Colorado applied later to the main river.<sup>11</sup>

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<sup>9</sup>Hubert Howe Bancroft, History of Arizona and New Mexico, 35, 36.

<sup>10</sup>Herbert E. Bolton, The Spanish Borderlands, 92.

<sup>11</sup>Hubert Howe Bancroft, op. cit., 154.



The man who led the way into Arizona and Lower California was one of the heroic figures of American History--Eusebio Francisco Kino. As an explorer Kino ranks among the greatest of the Southwest. From Mission Dolores, during the twenty-four years of his ministry, he made over fifty journeys, which varied in length from a hundred to a thousand miles. He crossed repeatedly the various directions all the country between the Magdalena and the Gila rivers and between the San Pedro and the Colorado.

Kino had come to America with the belief that California was a peninsula, but under the influence of current teachings, he had accepted the theory that it was an island. During his journey to the Gila River in 1699, however, the Indians had made him a present of some blue shells such as he had seen on the western coast of California and nowhere else. He now reasoned that, as the Indians could not have crossed the Gulf, California must be, after all, a peninsula. To test this theory, was the principal object of Kino's later explorations. By 1702 he had explored the Colorado from the mouth of the Gila to the Gulf and had proved to his own satisfaction at least, that Lower California was not an island but a peninsula. The map which he made of his explorations, published in 1705, was not improved upon for more than a century.<sup>12</sup>

The government first became interested in the river when they established a military post at the mouth of the Gila River for the purpose of protecting the constantly augmenting movement of California gold seekers.

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<sup>12</sup>Herbert E. Bolton, The Spanish Borderlands, 197.

It was in 1851 that the first government exploration was made across northern Arizona. Captain L. Sitgreaves was ordered to follow the Zuni, Colorado Chiquito, and Colorado Rivers down to the gulf. With a party of twenty he left Zuni in September, but did not attempt to follow the river through the great canons. . . . Sitgreaves' exploration was followed in 1853-4 by the 35th parallel Pacific Railroad survey under Lieutenant A. W. Whipple. With Lieutenant J. C. Ives as chief assistant in a corps of twelve, and an escort of the 7th U. S. infantry under Lieutenant Jones, Whipple, having completed the survey from Fort Smith across New Mexico, left Zuni on November 23, 1853. His route was for the most part somewhat south of that followed by Sitgreaves, through his survey covered the same region.<sup>13</sup>

After the discovery of gold in California, emigrants in large numbers began to cross southern Arizona, from Sonora and other Mexican states in 1848, and from the eastern United States in 1849.

The outstanding figure of the latest half century of Colorado River history is that of Major J. W. Powell. Powell's two Colorado River voyages were undertaken in the interest of science, but after the completion of the second in 1872, nearly half a century went by before another important expedition dedicated to that cause navigated the canyon sections of that stream. This was due to the fact that there was no demand for further scientific data. When such a demand arose, in connection with comprehensive plans for the utilization of the waters of the river for power and irrigation, canyon navigation was resumed.

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<sup>13</sup>Hubert Howe Bancroft, History of Arizona and New Mexico, 482.

Among Arizona explorations of later years, Major J. W. Powell's adventurous trip down the Colorado deserves especial mention:

With a party of ten, in four boats built expressly for the purpose, Powell left the railroad and started down Green River, late in May 1869. In the early days of August he crossed the Arizona line, and for about a month was whirled by the torrent through the tortuous channel of the great canons, whose precipitous sides towered to the height of several thousand feet--sometimes over a mile--above the voyagers' heads. The river proved a succession of rapids and whirlpools; each day's advance brought its new perils and toil; hairbreadth escapes from destruction were of frequent occurrence; one of the boats was lost; and the supply of instruments, food, and clothing gradually disappeared in the never-ending series of accidents. On August 27th three of the party resolved to scale the cliffs and make an attempt to reach the settlements. It is believed that they were killed by Indians. The rest continued their voyage in two of the boats, and in three days found succor and reached the mouth of the Rio Virgen. From this point three men went on down the Colorado, while Powell and the rest found their way to Salt Lake City. In this connection also should be mentioned the surveys of Captain George M. Wheeler and his corps in 1871-8, by which a large portion of Arizona was for the first time accurately mapped.<sup>14</sup>

The Geological Survey has been active in the Colorado Basin from the time of its creation in 1879. Much of this work was in continuation of that initiated by Major Powell in the years following his final voyage.

Systematic stream measurement was begun in 1889, with the establishment of three gauging stations. Stream flow records have been recorded from many points. Studies

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<sup>14</sup>Hubert Howe Bancroft, History of Arizona and New Mexico, 536.

were made of several projects on which construction has not yet been undertaken; investigations and surveys of reservoir sites for the control of the Colorado were also made in this period.

Much of this special survey work has been done by land parties, but in reaching extended stretches of the river inaccessible by other means boats had to be resorted to. The Upper Green and Cataract Canyon were surveyed by parties of the seasons of 1921-1922. The third section of the Colorado was completely mapped in 1923.<sup>15</sup>

In the study of the water resources of the Colorado River, the United States Reclamation Service, the Indian Office, the Forest Service and the Weather Bureau have all co-operated. Many investigations as to the available water supply for particular projects and the feasibility of proposed works have been definitely outlined. A study of storage on the Gila, San Juan, Grand, and Green rivers, and on the Colorado below the junction of the Grand and Green have been made.

According to E. C. LaRue, an authority on the study of this river, and a member of the Reclamation Service:

The Geological Survey has been able to maintain gauging stations on the Lower Colorado River because the greater part of the expense has been borne by the States of Arizona and California, the Bureau of Reclamation, the Imperial Valley Irrigation District, the Southern California Edison Company, the Federal Power Commission, the city of Los Angeles, the United States Weather Bureau, and the Palo Verde Irrigation district.<sup>16</sup>

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<sup>15</sup>E. C. LaRue, Colorado River and its Utilization, 11.

<sup>16</sup>Op. cit., 11.

In his message to Congress, on December 4, 1928, Calvin Coolidge emphasized the importance of the Federal Government aiding the States in the reclamation and irrigation projects, in which he said:

For many years the Federal Government has been committed to the wise policy of reclamation and irrigation. While it has met with some failures due to unwise selection of projects and lack of thorough soil surveys, so that they could not be placed on a sound business basis, on the whole the service has been of such incalculable benefit in so many States that no one would advocate its abandonment. The program to which we are already committed, providing for the construction of new projects authorized by Congress and the completion of old projects, will tax the resources of the reclamation fund over a period of years. The high cost of improving and equipping farms adds to the difficulty of securing settlers for vacant farms on Federal projects.

Readjustments authorized by the reclamation relief act of May 25, 1926, have given more favorable terms of repayment to settlers. These new financial arrangements and the general prosperity on irrigation projects have resulted in increased collections by the Department of the Interior of charges due to reclamation fund. Nevertheless, the demand for still small yearly payments on some projects continues. These conditions should have consideration in connection with any proposed new projects.<sup>17</sup>

It is very interesting to note what an important part this great river has had in the history of Arizona and California, in the past as well as the future.

Bancroft gives this fact:

It had doubtless been the original intention that the Colorado should be the boundary between Arizona and California, but owing to a peculiar bend of the river, the line as correctly surveyed from the Gila junction toward San Diego left a small area south and west of

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<sup>17</sup>Calvin Coolidge, Message to Congress, December 4, 1928.

the Colorado opposite Fort Yuma, technically in California. On this area was a considerable amount of taxable property, including the ferry buildings. The Arizona legislature rather indiscreetly asked Congress for the land in 1864-5; California took the hint; the property was taxed by both Yuma and San Diego counties; and a spirited controversy was carried on from about 1867. Each claimant ridiculed the other's absurd pretensions. In 1871 there seems to have been some kind of a decision at Washington in favor of Arizona, and after 1873, I find no trace of the dispute.<sup>18</sup>

What is to be the future of this vast region?

Doubtless, its forests will be utilized, its mineral wealth will be exploited, its wonderful scenic beauties will be unfolded. Its greatest development must come, however, from its water resources, on which the development of its other resources must largely depend. Without the water afforded by the Colorado River and its tributaries this basin will remain forever a vast desert. These rivers make possible not only the construction of large irrigation systems and growth of towns, cities, and prosperous agricultural communities, but also the generation of hydro-electric power for lighting, heating, industrial uses, and transportation of freight and passengers.

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<sup>18</sup>Hubert Howe Bancroft, History of Arizona and New Mexico, 529.

## CHAPTER II

### THE COLORADO RIVER BASIN

The first service a good river performs for the man who finds it is to give him a water-way by which to get around and explore the country. Later it floats his logs, runs his mills, waters his fields and--if it is a big enough stream--bears his commerce. The Tigris and the Yangtse, the Rhine and the Danube, the Ohio and Mississippi, did all of these things in turn, and with only an occasional protest in the way of a springtime flood. But the turbid waters of the Colorado was hostile even to the first explorers. The stout-hearted conquistador and the trapper who survived his first battle with the upper gorges rarely risked renewal of the conflict. For three centuries the hundreds of miles of middle canyons were hardly crossed, let alone navigated.

In every country the great rivers have presented attractive pathways for interior exploration--gateways for settlement. Eventually they have grown to be high-roads where rich cargoes of development, profiting by favouring tides, floated to the outer world. Man, during all his wanderings, in the struggle for subsistence, has universally found them his friends and allies. They have yielded to him as a conquering stranger, they have at last become for him foster-parents. Their verdant

banks have sheltered and protected him; their skies have smiled upon his crops. With grateful memories, therefore, is clothed for us the sound of such river names as Thames, Danube, Hudson and Mississippi. They may also be considered the binding links of civilization. . . . Then, by contrast, it is all the more remarkable to meet a great river which is none of these helpful things, but which, on the contrary, is a veritable, dragon, loud in its dangerous lair, defiant, fierce, opposing utility everywhere refusing absolutely to be bridled by commerce, perpetuating a wilderness, prohibiting mankind's incroachments, and in its immediate tide presenting a formidable host of snarling waters.<sup>1</sup>

Although the Colorado River is often called the American Nile, there are some respects in which it bears more resemblance to the Yangtse, than to the great North African River. Like the Yangtse, the Colorado takes its rise among the snows of high lofty mountains, cuts through great central gorges, and flows across a great alluvial valley to the sea.

The Nile draws most of its waters from tropical rains rather than from the snows of lofty mountains, and it flows through no great central canyon series. The lower valleys of both rivers are in nearly the same latitude, having similar climates, similar crops and

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<sup>1</sup>Frederick S. Dellenbaugh, The Romance of the Colorado River, 1.



similar problems.<sup>2</sup>

Like the Nile the Colorado carries an enormous quantity of silt. By the deposition of silt each river has built up a delta cone at its mouth. The soil of the deltas is exceedingly fertile and wonderful crops can be grown. The climate of the Nile is similar to that of the valley of the Lower Colorado. The precipitation is small and crops can not be raised without irrigation. Every kind of crop in the valley of the Nile in Egypt can be grown in the region of the Lower Colorado. The principal crops in the lower region, including Imperial Valley, are cotton, alfalfa, barley corn and melons.

After careful study and many geological surveys for the government, Mr. E. C. LaRue gives this interesting comparison of the two rivers mentioned above:

Total area of Nile Basin . . . . .	sq. mi.	1,112,000
Total area of Colorado . . . . .	" "	244,000
Length of Nile (source of Kagera to Sea) . .	" "	3,946
Length of Colorado (source of Green to Gulf)	" "	1,700
Total fall in the Nile (source to mouth)	Feet	6,600
Total fall in Colorado (source to mouth)	"	14,000
Irrigable area of Nile in Egypt	acres	6,663,000
Irrigable area of Colo. Valley (below Virgin)	"	2,735,000
Area irrigated in Nile Valley, Egypt--1913	"	5,351,000
Area irrigated in Colo. Basin (below Virgin) '13	"	367,000
Mean annual run-off of Nile at Cairo . . .	acre-feet	68,000,000
Mean annual run-off at Yuma, Arizona . . .	" "	17,000,000 <sup>3</sup>

The Southwestern part of the United States is dependant upon the development of the Colorado River. Without

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<sup>2</sup>Lewis R. Freeman, The Colorado River, 369.

<sup>3</sup>E. C. LaRue, Colorado River and Its Utilization, 8.

adequate control of its flow, many acres of rich agriculture land will remain desert forever. An enlarged vision of the importance of reclamation was expressed by President Hoover in the following statement:

Water is to-day our greatest undeveloped resource. Our streams and rivers offer us a possible total of 55,000,000 horsepower and of this less than 11,000,000 has been developed. Of our 25,000 miles of possible inland waterways probably less than 7,000 are really modernized, and the utility of much of these 7,000 miles is minimized by their isolation into segments of what should be connected transportation systems. . . . We still have 30,000,000 acres of possible reclaimable and irrigable lands. And these water resources lie in every part of the union--the great basins of the Columbia, the Colorado, the Sacramento, the San Joaquin, the Ohio, the Cumberland, the Tennessee, the Hudson, the Great Lakes, the Saint Lawrence and many others. . . . True conservation of water is not the prevention of use. Every drop of water that runs to the sea without yielding its full commercial returns to the nation is an economic loss, and that loss in all its economic implications can be computed in billions. . . . I am not proposing that all these things should be done tomorrow. At this moment we could not make economic use of the whole of this power, or all this land, or all these inland waterways--but we will need the whole of it within half a generation. And at this moment we have the urgent need for beginning certain major projects which will require years for completion.<sup>4</sup>

The Colorado River is the largest stream in southwestern United States. It flows through or borders on seven States, namely: Arizona, California, Colorado, Nevada, New Mexico, Wyoming, and Utah. This great river and its tributaries rise in the mountains of Wyoming, Colorado, and Utah, where precipitation, especially in the form of snow, is very heavy. The valleys of its lower

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<sup>4</sup>Herbert Hoover, New Reclamation Era, February, 1929.

tributaries have an excellent climate that is well adapted to agriculture and industry. Its sources are all within the territory of the United States but its final channel, delta, and mouth are in the territory of Mexico.

At its mouth the river has built an immense delta from the materials eroded in the canyons and by this means formed a dike across the Gulf of California. This had the effect of cutting off entirely the northern end of the Gulf at about where the international boundary line between California and Mexico is now. This cut off portion of the Gulf is a deep bowl or depression below sea level and includes the Imperial and Coachella Valleys and a great lake at the bottom of the depression known as the Salton Sea. The surface of this sea is approximately 250 feet below sea level, with an area of about 150,000 acres.<sup>5</sup>

On January 5, 1928, James R. Garfield, after a careful investigation of the Lower Colorado River, submitted the following report to Hubert Work, who was then Secretary of the Interior:

The entire watershed is a unit. The use of any large amount of water in any particular place along the course of the river for the development of irrigation or power must be considered in connection with the entire river. Its use and development can not physically be limited by State or International lines. Whether a particular point is developed in territory where the doctrine of appropriation and beneficial use obtains, or in a territory where the doctrine of riparian ownership obtains; is for practical purposes of but little moment. One universal natural law obtains, namely, that water arising in mountain peaks of necessity find its way to

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<sup>5</sup>Colorado River Commission of California, The Boulder Canyon Project, 13.

the sea. Man may retard, impound, and use the water at special points, but the use at that point is absolutely dependent upon the source of supply above and upon the right of drainage below. The effect of this natural law is greatly increased in a river subject, as the Colorado River is, to both seasonal and unexpected floods of great volume.

The jurisdiction of a single State is not broad enough to deal with all the problems that necessarily arise in the construction and development of such a project as that under consideration. The United States alone has the power properly to safeguard the interest and rights of all those who may be affected by such a major development, and is, furthermore, the only political agency that can deal with and settle the international question arising with Mexico.

The Colorado River is a navigable stream, both actually and potentially. From 1852 to 1917, many reports were made by governmental engineers upon the question of navigation; Congress has made various appropriations for the development of navigation, and at no time has Congress abandoned, directly or by silent acquiescence, the position that the stream is navigable. The amount of navigation is immaterial. In the days before the railroads reached that territory all the Government and other supplies were brought up the river to points several hundred miles within the territory of the United States. If the flow of the stream is controlled by the erection of a dam at Boulder Canyon, the lower stretches of the river would readily be made useful for navigation and the great area of the reservoir above the dam would make possible its use for navigation into regions hitherto inaccessible.<sup>6</sup>

The Colorado River is one of the most remarkable rivers of the world in its value for irrigation and water power. It combines in proper sequence for complete use a large quantity of water, great concentrations of fall, reservoir sites for control of flow, sites for power plants, and several million acres of irrigable

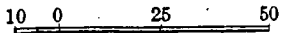
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<sup>6</sup>James R. Garfield, "The Colorado River Basin," 70th Cong., 1st Sess., Document 728, 431.

DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION  
COLORADO RIVER BASIN  
BELOW BOULDER DAM

**MAP NO. 23566**

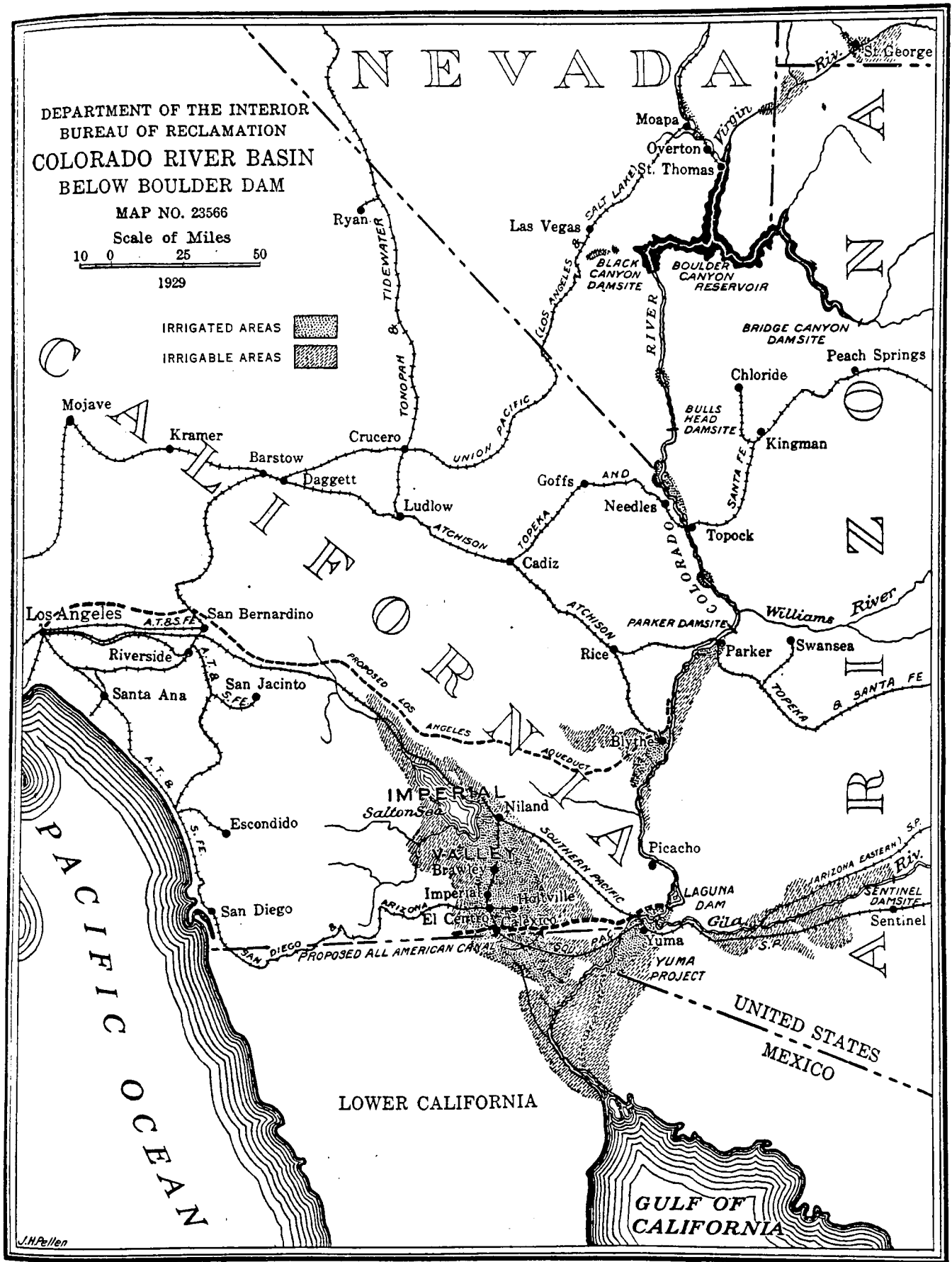
### Scale of Miles



1929

IRRIGATED AREAS

## IRRIGABLE AREAS



land below the stretch where power may be developed. The Columbia also, may be used largely for both water power and irrigation, but no other river on this continent affords such enormous opportunities for this double use of its water.

The Colorado River, one of the large rivers of the country, drains an area of about 244,000 square miles and has a total length from source to mouth of about 1700 miles.

Its total fall is over 7,500 feet, or an average fall of about 4.5 feet per mile. The average rainfall on the drainage area is about 10 inches, over thousands of square miles less than 5 inches, and the average run-off is less than  $1\frac{1}{2}$  inches. Its main flow is derived from the melting of snow on the mountains of the upper basin. The principal characteristics of its flow are low water during the autumn and winter months, with a normal flood from the melting snows, usually beginning late in April, reaching its maximum in June, and ending by the middle of August. This flow is modified and intensified by torrential floods of short duration, which come in general from its southern tributaries, and may occur during almost any month of the spring, fall or winter. Its flood flows afford by far the greater quantity of water produced by the stream, and must be conserved and impounded in order to be successfully utilized for water supply and power production. Floods of 200,000 second-feet are not unusual, and much larger ones have occurred.<sup>7</sup>

The flow of this great river is unlike many rivers in the following respects:

Actual measurements, taken over a period of twenty-five years show an average annual discharge of water by the river of approximately 17,000,000 acre-feet. The river varies greatly in flow, both annual and seasonal. One year the discharge may be as great as 25,000,000 acre-feet; another year it may be as low as 9,000,000 acre-feet. Even more striking is the

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<sup>7</sup>Sibert Board Report, "Second Deficiency Appropriation Bill for 1930," Hearings before Subcommittee on Appropriations, 71st Cong., 2d Sess., 1117.

seasonal variation. In flood, the discharge at times is more than 200,000 cubic feet per second. In August, September, and October the river is at low flow. Frequently this flow is as low as 2,500 cubic feet per second. On September 11, 1924, it was less than 1,300 cubic feet per second.<sup>8</sup>

It is indeed very unfortunate that the actual measurements of the River have only covered a period of twenty-six years. Those who have carefully investigated this data believe that the estimated future flow of the Colorado River must be based on the flows of the past with the justifiable assumption that they will recur. Records reveal the fact that the low and high flow occur in cycles of very uncertain magnitude and duration. From 1905 to 1927, was a period of relatively high flow; while from 1886 to 1905 the annual flow was very low. The Sibert Report suggests the following conclusion as to stream flow:

The records of past performance of the Colorado River and of such other streams in this vicinity as seem pertinent, furnish no basis for an exact estimate of long-past flows in the Colorado River. There is naturally considerable leeway in the interpretation of these data, and estimates based thereon may differ materially. The board, however, realized that in determining the economic feasibility of this project its estimates should be on the safe side and it has consequently adopted the following figures for the flows at Black Canyon, without further depletion:

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<sup>8</sup>Hearings United States House of Representatives, 69th Cong., 2d Sess., Document 1657, 3.

	acre-feet
Average low flow for a period of 15-20 years . . .	10,000,000
Average high flow for a similar period . . . . .	14,500,000
Average of high and low periods. . . . .	12,250,000

It is estimated that the present flow is depleted by water taken for irrigation in the upper basin by approximately 2,750,000 acre-feet, which amount if added to the above estimated average flow would increase it to about 15,000,000 acre-feet. This is the amount apportioned by the Seven States compact for division at Lee's Ferry.<sup>9</sup>

The Federal Government has given consideration to the development of the Colorado River for a number of years. At the present time the people of these states feel that they are asking nothing from the Federal Government except the permission to go ahead and the temporary loan of our national credit. Thus they feel that not only are they asking a subsidy, but rather for the mere opportunity to help themselves.

The late President Harding expressed the following thought in an address which he expected to deliver at San Diego. He was prevented from delivering this address by death. He said:

Such a gigantic operation may not be accomplished within the resources of a local community. It is my view, and I believe the accepted view of a large part of our people, that the initial capital for the installation of these engineering works must be provided by the American people as a whole, and truly the American people as a whole benefit from such investment. The additional to our national assets of so productive a unit benefits, not

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<sup>9</sup>Sibert Board Report, "Second Deficiency Appropriation Bill for 1930," Hearing before Subcommittee on Appropriations, 71st Cong., 2d Sess., 1123.



alone the local community created by it, but also, directly and indirectly, our entire national life. . . . I should, indeed, be proud if during my administration I could participate in the inauguration of this great project by affixing my signature to the proper legislation by Congress through which it might be launched. I should feel that I had some small part in the many thousands of fine American homes that would spring forth from the desert during the course of my life time as the result of such an act and in the extension of these find foundations of our American people.<sup>10</sup>

According to Senator Hiram Johnson, of California, the Boulder Canyon Reclamation project will serve four main purposes:

First: It will relieve a very serious and ever-present flood danger to the Imperial Valley as well as other sections along the lower river both in Arizona and California. Imperial Valley occupies a sink or basin lying from 100 to 250 feet below the bed of the river. It has no drainage outlet. Hence, its flooding means its permanent destruction.

Second: It will end an intolerable situation, under which the Imperial Valley now secures its sole water supply from a canal running for many miles through Mexico, as well as make possible the reclamation of a large area of public lands lying around the rim of the present cultivated section in the valley.

Third: It will conserve flood waters of the river which in addition to providing for irrigation development will make it possible for rapidly growing cities of southern California to secure a domestic water supply from the water thus saved.

Fourth: It will create a large amount of desirable hydro-electric power, making the project a financially feasible one.

The construction of the dam in addition to providing effective flood control and making available the flood waters for irrigation and domestic uses, will fully

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<sup>10</sup>Warren G. Harding, Hearings House of Representatives, 68th Cong., 1st Sess., 1884, 1885.

regulate the flow of the river. With its flow unregulated the river can not be successfully used as a highway for commerce; in its regulated form it will provide a safe and dependable flow below the dam that can be used by power boats and other small craft. The reservoir created by the dam will be the largest artificial lake in the United States and capable of successful navigation.<sup>11</sup>

The Federal Government is the proper agency to undertake such a great development because the Colorado River is an interstate and international stream and because of the various conflicting uses of water such as for flood control, reclamation and power generation. The Reclamation Service has had wide experience in large dam construction. Benefits from natural assets of the magnitude here involved should be fairly and widely distributed. This can best be accomplished by the Government taking the initiative, as in the bill provided. This idea was well expressed by the Herbert Hoover in his report of January 12, 1926, where he said that interstate and international rights and interests involved, the diversified benefits from the construction of these works, the waiting necessities of cities for increased water supplies, the large development of latent agricultural resources, the protection of those already developed, and the immense industrial benefits which may come from the production of cheap power, which together appear to render the construction

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<sup>11</sup>Hiram W. Johnson, "Boulder Canyon Reclamation Project," 69th Cong., 1st Sess., Document 666, 5, 6.

and subsequent control of these works a measure of such economic and social importance that no agency but the Federal Government should be entrusted with the protection of rights or distribution of its opportunities. All uses can be coordinated and the fullest benefits realized only by their centralized control.

## CHAPTER III

## CONTROVERSY BETWEEN ARIZONA AND CALIFORNIA

The Colorado River Development problems are very complex and difficult to solve. They are many and profound. All would be relatively simple if these were merely engineering and construction of the largest dam in the world. The three major problems presented are (1) interstate interests; (2) National interests; and (3) international interests.

Besides problems of engineering importance, this Colorado River question has raised many problems of law; (2) of national and interstate relations; (3) of local, regional, economic, and social needs. State pride and State rights have necessitated innumerable conferences among representatives of seven states on the subjects of both water and power allocations. The final states in these conferences have been proceeding in Washington.<sup>1</sup>

The ordinary construction and engineering tasks are as follows:

- (1) To control the flow of a great river not only for flood, and irrigation purposes,--but for power and domestic water development as well.
- (2) Tremendous silt problem.
- (3) Political and sectional difficulties in seven sovereign States.
- (4) The controversial subject of governmental development and operation of hydro-electric power. In this respect the Colorado River Development may be said to resemble the Muscle Shoals controversy.
- (5) Legal questions both National and State.

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<sup>1</sup>C. A. Dykstra, Colorado River Development and Related Problems, 1.

In discussing the problem of construction of the Boulder Dam, President Hoover expressed his opinion in the following statement:

I may say that the Colorado River problem does not lie in the lack of enormous resources in water, in arid land, and in power, or of private or public capital to develop it. The difficulties are the sharp conflicts of opinion of the people in the basin on a multitude of questions as to their rights, their interests, and the method of development of the river. And these conflicts have been in course of discussion, to my knowledge for some fifteen years.

First of the conflicts, and the one that overrides all others, is the conflict over water rights between the seven States. The four States in the upper basin have, naturally, opposed any development in the lower basin until such time as they could have assurance of some fixed assurances of their water rights. As the committee is well aware, the application to beneficial use will give priority in water rights as between States, and, as the development of the Colorado River will take place in the upper basin, therefore the upper-basin States have justifiably been resolute in their demands for some fixation of the rights before there shall be construction and thus extension of beneficial use down below.<sup>2</sup>

The Article X, of the United States Constitution gives rights for States to compact between themselves, respecting, matters which directly concern them, reserving only to Congress the right of approval or veto. The following provisions exist:

- (1) No State or number of States can force a compact on another state not consenting.
- (2) State must decide whether they will join.
- (3) Congress has no power to make a compact for states, or decide any terms.

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<sup>2</sup>Herbert Hoover, United States Senate, 70th Cong., 2d Sess., Document 186, 70.

(4) Legislatures of State must first ratify before it is binding.

The Colorado River has been under observation by army engineers and officials of the Department of the Interior since 1857. There were on hand considerable data when an act of Congress, known as the Kinkaid Act, directed the Secretary of the Interior to examine the Imperial Valley with a view to determine the area and character of un-irrigated lands in the valley which might be irrigated at reasonable cost, and to report to Congress the result of his examination and his recommendations as to the feasibility and advisability of undertaking a dam on the river and the participation therein by the United States. The Secretary of the Interior was also required to report in detail the character and estimated cost of a plan, and "if the said plan shall include storage, the location, character, and cost of said storage." This Act was passed and approved May 18, 1920.

The report required by the Kinkaid Act was submitted to Congress February 28, 1922, and is known as Senate Document 142, Sixty-seventh Congress, Second Session, popularly known as the Fall-Davis report. This report, consisting of nearly three hundred pages of details, recommended that the United States Government construct a canal from Laguna Dam to Imperial Valley; the Government to be reimbursed by the land benefited; that public lands

to be reclaimed be reserved for ex-service men; and that the United States Government construct a reservoir at or near Boulder Canyon on the lower Colorado River, to be reimbursed by the revenues from leasing the power privileges incident thereto.

A bill to carry out the recommendations contained in this report, was promptly introduced in Congress. In a report of this bill, which is known as the Swing-Johnson Bill, it was purposed to construct a dam at Boulder Canyon and also a power plant.

Pursuant to an act of Congress, approved August 19, 1921, President Harding appointed Secretary of Commerce Herbert Hoover as the Chairman of a commission made up of one representative from each of the seven states in the Colorado River Basin. The members of this commission were appointed in conformity with acts of the legislatures of the several states, and the commission's function was to attempt to divide the waters of the Colorado River system between the various states.

Meetings of this commission were held during the summer of 1922 in Washington, C. D., Cheyenne, Wyoming; Denver, Colorado; Salt Lake City, Utah; Los Angeles, California; Phoenix, Arizona; and Santa Fe, New Mexico.

At the meeting held in Santa Fe on November 24, 1922, a document since known as the Colorado River Compact, was formulated and signed by the representatives of all the states. This compact, instead of allocating to each state a

certain amount of water, divided the water of the Colorado River system between two groups of states. Mr. Delph E. Carpenter, of Colorado, who was one of the formulators of the Colorado River Compact gives the reason for this:

All territory within the United States of America to which the waters of the Colorado River and its tributaries are or may be beneficially applied is designated as the "Colorado River Basin." The drainage area of the river consists of two great natural subdivisions, viz: the upper region, located above the head of the great canyon, and the lower region, below the great canyon (including the territory drained by the Gila, Little Colorado, and other lower tributaries). Lee's Ferry is situated at the head of the canyon, the State of Arizona, a few miles southerly from the intersection of the Colorado River with the boundary common to the States of Arizona and Utah, and is the natural point of demarcation between the upper region and the lower region.

All waters of the entire river system within the upper region (including those returning to the river from irrigated lands) unite to form a single stream at Lee's Ferry, where the flow may be measured and recorded.

The Colorado River Compact conforms to this natural division: The upper region, plus all lands outside the drainage area which may be beneficially served by waters diverted from the river, is designated as the "upper basin." The lower region is designated as the "lower basin."<sup>3</sup>

The irrigable areas in the states of Colorado, New Mexico, Utah, and Wyoming, on the upper portion of the river, are separated by several hundred miles of deep and narrow canyons from the irrigable areas in the states of Arizona, California, and Nevada, on the lower portion of the river, and the commission divided the water between the "Upper Basin and the "Lower Basin."

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<sup>3</sup>Delph E. Carpenter, United States Senate, 70th Cong., 2d Sess., Document 186, 35.



The Colorado River Basin comprises an area which approximates 262,500 square miles. This is 54,371 square miles greater than the area of France. The region includes about one-fourth of Wyoming, almost the western half of Colorado, Eastern half of Utah, one-sixth of New Mexico, the whole of Arizona and small portions of Nevada, California and Mexico.<sup>4</sup>

The Upper Basin States furnish about 85% of the flow of the river. They are states in which the snows of winter are relatively heavier than the lower basin states. Rainfall is much more abundant in the upper states. Millions of acres of lands are irrigable in the upper basin and possibilities exist for large developments of hydro-electric power. It is strange, therefore, that the upper basin states are interested primarily in irrigation and power development. They have no reason to be interested in flood control as the Imperial Valley. Denver, also, asserts a claim to the waters in this area.

The hundreds of miles of deep, barren canyons which connect the upper and lower basins contain numerous power sites.

The "Lower Basin States" comprise Arizona, California, and Nevada. This portion of the Colorado River system supplies only about 15% of the water of the river, but has extensive possibilities for the use of water for domestic, agriculture, and power purposes.

The Santa Fe Compact, providing for a division of the waters of the Colorado River, was negotiated in the fall of 1922. This compact was subject to the ratification of the legislatures of the respective states. All of the states,

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<sup>4</sup>Reuel Leslie Olson, The Colorado Compact, 7.

except Arizona ratified the compact. Senator A. H. Favour a member of the Arizona Colorado River Commission, explains why Arizona would not ratify the compact:

Arizona never ratified the Colorado River Compact, chiefly for the reason that this state believed that it was wiser and safer to first negotiate a tri-state compact or a compact between the Lower Basin states respecting the share which each state would receive from the waters allocated to the Lower Basin by the Santa Fe Compact; and if such a compact could be obtained, then both the Tri-State Compact and the Santa Fe Compact could be treated as one instrument and ratified together.<sup>5</sup>

The reason for this compact grew out of the desire of the Upper Basin States to protect their future requirements for water. The "prior appropriation of water doctrine" was in full force in the seven states of the River Basin. Under such a doctrine:

Any states taking water from the river and applying it to a beneficial use, acquired a prior right thereto, which was superior to the right of a subsequent appropriator, whether in the same or in another state. California for years has been advocating the building of a large storage dam on the Colorado River and a canal, all of which should be on American soil. This canal was to be of large enough capacity to carry waters for the irrigation of lands of the Imperial and Coachella Valleys. In these valleys at the present, are large tracts of dry land, which could be irrigated if water were available. All the Basin States knew if this dam and canal were built, a large part of the river flowing in the Lower Basin would be applied to lands of the California valleys, with the result that California would thereby secure by prior appropriation a vested right to a large amount of the river water and thereby acquire rights against all other states, especially against those states which were not ready now to appropriate and use the water. These other states knew that if this water were taken by California, then in the future, when these states could use the water, the right thereto would be lost by the prior appropriation made by the state of California. This was the reason that the northern states were agitating for a Seven States Compact which would allocate a certain amount of the river waters in perpetuity

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<sup>5</sup>A. H. Favour, Arizona's Rights in the Colorado River, 3.

to each of the seven states. If such allocation were made by compact, then the doctrine of prior appropriation as between states would be set aside and each would know its allocation and could rely and count upon the amount allocated. And while the water might continue to flow into the Lower Basin, and to be taken and used by the Lower Basin States, yet at any time the other states to which the allocation had been made were in need of water, they would have the right to take it.<sup>6</sup>

It is a matter of great concern that Arizona failed to ratify the Colorado River Compact, thus making a Seven-State Compact possible. Governor Emerson, of Wyoming, expressed his regret in a statement made before the Senate Committee on Irrigation and Reclamation:

Few realize the real magnitude of the great project that is proposed at Black or Boulder Canyon--a dam twice as high as any dam that has been constructed in the world heretofore; a reservoir seven or eight times the capacity of any reservoir that has been constructed heretofore. The magnitude of this project is so great that we should be sure we are right before we go ahead. There is no such urgency for relief from conditions applying to the physical situation upon the lower river as to warrant any course but to allow all reasonable time and effort for the completion of the seven-State agreement by the approval of all the seven States.

I feel that it would be a decided mistake to see a project authorized at this session of Congress, as by so doing it is certain that an advantage would be given in negotiation to one of the three States of the lower basin. The carrying on of negotiations looking forward to the complete acceptance of the seven-State compact would thereby, in my opinion, be seriously handicapped.

I wish to submit that the approval by all the seven States of the Colorado River Compact, representing an equitable agreement for the use and distribution of the water of the Colorado River System, will be most valuable to each of the seven States. It is essential, it seems to me, not only in consideration of the matter of equity to all of the States, but also as a means

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<sup>6</sup>Charles B. Ward, Colorado River Controversy, between Arizona and California, 7.

of clearing the situation in a practical way for the orderly development of the river.<sup>7</sup>

In a report on the development of the Lower Colorado River, by James R. Garfield to Hubert Work on January 5, 1928, the following thought is expressed:

The seven-State Compact was evolved for the purpose of compromising the differences of opinion which have arisen between the people of the various States regarding the development of the Colorado. It is unfortunate that the compact has not been ratified by all the States, but failure of ratification does not prevent the Federal Government from going forward with the construction if Congress so decides. It is also true that no single State could, either directly or indirectly through a corporation created within its jurisdiction, proceed with the development.

The Federal Power Commission, which under the general act of Congress would have jurisdiction to grant a license for the construction of a dam for power purposes, is prohibited by the joint resolution adopted March 4, 1927, from issuing or approving a license affecting the Colorado River or its tributaries until and unless the compact has been approved by Congress or, in the event that the contract is not sooner approved, until March 5, 1929.<sup>8</sup>

The Colorado River Commission of Arizona after much deliberation has set forth eight basic points by which they will consent to ratify the Colorado River Compact:

That Arizona will accept the Colorado River Compact, as agreed upon at Santa Fe, New Mexico, if and when the same

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<sup>7</sup>United States, "Hearings before the Senate Committee on Irrigation and Reclamation," 70th Cong., 1st Sess., S. 728 and S. 1274, 206.

<sup>8</sup>James R. Garfield, op. cit., 432.

is amended or supplemented to make definite and certain the provisions essential to the protection of Arizona's rights and requirements.

2. That it is imperative that before regulation of the Colorado River is undertaken, Mexico be notified that this country reserves for use in the United States water made available by storage within the United States, and if possible an agreement should be had with that country.

3. That any compact dividing the waters of the Colorado River and its tributaries shall not impair the rights of the States, under their respective water laws, to control the appropriation of water within their boundaries which is allocated to them.

4. That the waters of the tributary streams of the Colorado River below Lee's Ferry be reserved to the States in which they are located.

5. That the waters of the main Colorado River over and above the allocation of the 7,500,000 acre-feet to the Upper Basin States and any unused portion of the water allocated to the Upper Basin, shall be legally available to the Lower Basin States of Arizona, California and Nevada on the following basis of division:

A. To Nevada 300,000 acre-feet.

B. The remainder, after such deductions as may be made to care for Mexican lands which may be made by treaty, shall be divided equally between California and Arizona, each State to decide the site for the storage and diversion of waters allocated to it.

6. That the right of the States to secure revenue from and to control the development of hydro-electric power within or upon their boundaries be recognized.

7. That encouragement will be given, subject to the above conditions, to either private or public development of the Colorado River at any site or sites harmonizing with a comprehensive plan for the maximum development of the river's irrigational and power resources.

8. That Arizona is prepared to enter into a compact at this time to settle all of the questions enumerated herein, or Arizona will agree to forego a settlement of Items 6 and 7, and make a compact dividing the waters alone provided it is specified in such compact that no power plants shall be installed in the lower basin portion of the main Colorado River,

until the power question is settled by a compact between the States.<sup>9</sup>

According to Charles B. Ward, Chairman of the Arizona River Commission, there were other reasons why Arizona refused to ratify the Compact made in Santa Fe, in 1922:

First, Arizona objected to the inclusion of the Gila River, and, second, while the prior appropriation doctrine would thereby be destroyed between the two basins by the allocation of waters to each of them, yet it would remain in full force and effect as between California and Arizona, and that while the Upper Basin States had escaped the danger which they had feared by California appropriating a great amount of water through the all-American canal that it intended to build, yet the same danger would still confront Arizona.

These were the reasons why Arizona would not ratify the Seven States Compact. She knew that she could not compete in wealth or in influence with California, and that California could take the water allocated to the Lower Basin by prior right of appropriation and thereby destroy Arizona's chances of ever irrigating any considerable lands from the waters of the main Colorado River.<sup>10</sup>

The first serious controversy between California and Arizona came as a result of interpretation of Article III of the Colorado River Compact. According to the terms of the compact there is available in the lower basin what might be termed three kinds of water, Article III, (a) water, i.e. 7,500,000 acre-feet; to be divided between Nevada, California and Arizona; paragraph (b) i.e., 1,000,000 acre-feet (surplus water) (c) water which must be taken to satisfy any Mexican obligation, the balance is available for use in the lower basin.

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<sup>9</sup>Arizona Senate, "First Report of the Colorado River Commission of Arizona," 8th Legis., 4th Sess., Senate Document No. 1, 4.

<sup>10</sup>Charles B. Ward, Colorado River Controversy, 8.

Article III, of the Compact, division of waters was made between the two basins, as follows:

(a) There is hereby apportioned from the Colorado River System in perpetuity to the Upper Basin and to the lower Basin, respectively, the exclusive beneficial consumptive use of 7,500,000 acre-feet of water per annum, which shall include all water necessary for the supply of any rights which may now exist.

(b) In addition to the apportionment in paragraph (a), and Lower Basin is hereby given the right to increase its beneficial consumptive use of such waters by one million acre-feet per annum.

(c) If, as a matter of international comity, the United States of America shall hereafter recognize in the United States of Mexico any right to the use of any waters of the Colorado River System, such waters shall be supplied first from the waters which are surplus over and above the aggregate of the quantities specified in paragraphs (a) and (b); and if such surplus shall prove insufficient for this purpose, then the burden of such deficiency shall be equally borne by the Upper Basin and the Lower Basin, and whenever necessary the States of the Upper Basin shall deliver at Lee Ferry water to supply one-half of the deficiency so recognized in addition to that provided in paragraph (d).<sup>11</sup>

After careful analysis of the Article III, we find that Arizona and California are unable to reach a common understanding of its provisions: First: There are many differences of opinion in regard to exact amount of water passing Lee's Ferry. Some authorities believe that the figure is too high (7,500,000). Second: Arizona and California differ in regards to the uses of the 1,000,000 surplus waters mentioned in paragraph (b) of the Compact. This involves the tributaries of the Colorado River; namely: Gila River in Arizona. Third: Because of the fact that the Colorado is an international river, Mexico must receive some of the flow

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<sup>11</sup>Colorado River Compact, Article III, (a), (b), (c).

for irrigation. A discussion of each of these points of differences will be taken in order.

Article III, of the Colorado River Compact divided the waters equally between the Upper and Lower Basins. The Lower Basin agreed to accept these terms. Nevada demanded about 2%, this also was accepted by both California and Arizona. Of the remaining 48%, California demands 30%; leaving 18% to Arizona. These terms Arizona refused to accept, they contend that the Arizona area in the basin is seventeen times that of California; California has four times as much water in her own rivers as there is in the entire Colorado Basin. Arizona is willing to divide equally the 48% of water remaining after Nevada has been satisfied.<sup>12</sup>

One of the most difficult questions to compromise between California and Arizona is the allocation of water for each state. Much dissatisfaction has arisen and many proposals have been given, but as yet no solution of the problem seems near. So serious has this been that Arizona has filed suit against the building of the Boulder Dam, in the United States Supreme Court.

The United States Geological Survey gives the following summary of water supply data on Colorado River: Water supply and irrigable land:

Colorado River at Lee's Ferry:

Average recorded flow 1911-1923, computed from records of Green, Grand, and San Juan Rivers (Table 2, col. 6, pp. 104-106. . . . . 16,100,000

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<sup>12</sup>Colorado River Commission of Arizona, The Colorado River Question, 2.



## Colorado River at Lee's Ferry:

1911-1923 records extended back to 1895 to include  
dry cycle 1895-1906- (Table 3, col. 6, p. 108  
15,200,000

## Reconstructed River at Lee's Ferry:

This item is variously estimated at from 16,000,000  
to 17,000,000 acre-feet and taking into account  
prior dry periods, it is estimated at even less than  
16,000,000 (deducted from Table 6, cols. 4 and 5,  
p. 110. . . . . 16,600,000

## Colorado River at Lee's Ferry:

Corrected for depletion by irrigation, period 1895  
to 1922, one complete cycle (Table 8, col. 3, p. 112)  
14,350,000

Estimated present consumption in river flow upper Colo-  
rado Basin above Lee's Ferry (Table 8, col. 3, p. 112)  
5,470,000

Estimated present consumption upper Colorado Basin above  
Lee's Ferry (Table 6, col. 4, p. 110) 2,365,000

Estimated total present and future consumption in upper  
Colorado River Basin above Lee's Ferry (Table 8,  
col. 4, p. 112) . . . . . 7,835,000

Future average yearly river flow at Lee's Ferry after  
deduction of combined present and future water  
consumption by irrigation in upper Colorado River  
Basin (Table 8, col. 3, p. 112) . . . 8,880,000

Lower Colorado Basin Co., obligation at Lee's Ferry  
(see Colorado River Compact) . . . . . 7,500,000<sup>13</sup>

Due to the widely divergent statements relative to  
the acreages available for irrigation development in  
the three lower basin States, all the information avail-  
able has been compiled, collected and summarized:

In this brief resume of the data on the Colorado River, an  
attempt has been made to collect from the various reports,  
Document 142, Water Supply Paper 556, the Arizona engineering  
commission report, the Weymouth report, and various other  
reports, certain pertinent data pertaining to acreages, duty  
of water, consumptive duty, etc.

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<sup>13</sup>United States Geological Survey, Water Power and  
Flood Control of Colorado River below Green River, Utah,  
Water Supply Paper No. 556, pp. 101-123.

Arizona, most feasible project, 229,800 acres, acre-feet . . . . .	806,400
Arizona, total irrigable, 891,000 acres, acre-feet . . . . .	2,673,000
California, most feasible projects, 851,000 acres, acre-feet . . . . .	3,620,750
California, total irrigable, 1,123,000 acres (this item includes 1,000,000 acre-feet for Los Angeles). . . . .	5,613,000
Duty, consumptive use above Laguna . . . . .	4.35
Duty, consumptive use below Laguna . . . . .	3.00
Duty, pumping, head gate diversion . . . . .	4.00
Duty, pumping, net duty on land. . . . .	3.25
Evaporation annually exposed surface Boulder Canyon, approximate . . . . . depth	5.00
Los Angeles, to get 1,000,000 acre-feet and is included in California's irrigable projects	
Mexico, 200,000 acres. . . . . acre-feet	850,000
Nevada, most feasible projects, 15,000 acres, acre-feet . . . . .	63,730
Nevada, total irrigable, 80,000 acres, acre- feet. . . . .	340,000
Power, firm horsepower available present time from 550-foot dam of 26,000,000 acre-feet capacity approximately, . . . . . horsepower	800,000
Power, firm horsepower, available with full irrigation development. . . . . horsepower	550,000
Water available for irrigation and domestic use in United States in the lower basin, acre- feet . . . . .	8,250,000
Water available for power, on basis of 26,000,000 acre-feet storage. . . . . second-feet	21,500
Water available for power on basis of full upstream irrigation development, approx- imate second-feet. . . . .	13,000
Water available for power on basis of full irri- gation development of river with Bullshead or Parker for reregulating purposes, approx- imate . . . . . second-feet	13,000
Water, short, for complete lower basin develop- ment (this includes the 1,000,000 acre-feet for Los Angeles). . . . . acre-feet	375,980 <sup>14</sup>

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<sup>14</sup>Hearings before the Committee on Irrigation and  
Reclamation, United States Senate, 70th Cong., 1st Sess.,  
S. 728 and S. 1274, 505.

Below are the figures which represent approximately the total yearly flow of the Colorado River Basin, unreduced by irrigation consumption; in other words, the run-off of the reconstructed river. Upper and Lower Basin terms fit definitions of same in Colorado River Compact, as drafted at Santa Fe, New Mexico, November, 1922:

Total basin water supply, reconstructed river  
(VALUES in acre-feet)

	Acre Feet	Per cent	
Upper Colorado River Basin . . . . .	16,600,000	84	
Lower Colorado River Basin, less evaporation from the Gila River and Colorado River below Black Canyon, 1,500,000 . . . . .	3,100,000	16	
	19,700,000	100	15

Table 2--Colorado River Compact  
Allocations, Compact Nov. 1922

	Acre-feet	Per cent
Upper Colorado River Basin. . . . .	7,500,000	38
Lower Colorado River Basin. . . . .	8,500,000	43
Unallocated surplus . . . . .	3,700,000	19
	19,700,000	100

<sup>15</sup>Hearings before the Committee on Irrigation and Reclamation, United States Senate, 70th Cong., 1st Sess., S. 728 and S. 1274, 507.

The problem of a reconstructed river is a controversial matter and is included here as a fair average of the various opinions. The unallocated surplus is variously estimated between two and five million acre-feet.<sup>16</sup>

One of the most reliable reports on the Colorado River Development is the Report of the Sibert Board, given Dec. 3, 1928, the conclusions reached are as follows:

The estimated future flow of the Colorado River must be based on the flows of the past with the justifiable assumption that they will recur. Unfortunately, there are no actual measurements of the flows of the river for a longer period than 26 years, and these were made at Yuma. The use of these measurements for estimating the flow at Boulder Dam involves the necessity of considering various intervening gains and losses of water, the amounts of which are based on insufficient data and result in final estimates which are unsatisfactory.

It is also known that the period from 1905 to 1927, was one of relatively high flow in the Colorado and also in neighboring streams, and that this period was preceded by about 20 years of flow much below the average of the whole period of measurement. Records also show that periods of high and low flow occur in cycles of very uncertain magnitude and duration.

The records of past performance of the Colorado River and of such other streams in this vicinity as seem pertinent, furnish no basis for an exact estimate of long-past flows in the Colorado River. There is naturally considerable leeway in the interpretation of these data, and estimates based thereon may differ materially. The board, however, realizes that in determining the economic feasibility of this project its estimates should be on the safe side and it has consequently adopted the following figures for the flows at Black Canyon, without further depletion:

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<sup>16</sup>United States "Colorado River Development," 70th Cong., 2d Sess., Senate Document No. 186, 79.

	acre-feet
Average low flow for a period of 15-20 years. . . . .	10,000,000
Average high flow for a similar period. . . . .	14,500,000
Average of high and low periods . . . . .	12,250,000

It is estimated that the present flow is depleted by water taken for irrigation in the upper basin by approximately 2,750,000 acre-feet, which amount if added to the above estimated average flow would increase it to about 15,000,000 acre-feet. This is the amount apportioned by the seven States compact for division at Lee's Ferry.<sup>17</sup>

What is commonly called the Tri-State Compact is a proposed agreement between three states of the Lower Basin, that is, Arizona, California, and Nevada, to divide among such three states the waters allocated to the Lower Basin by the Seven States Compact. Other matters were sought to be covered by such a Tri-State Compact:

Arizona's stand has been that before the Seven States Compact should be ratified, there should be a tri-State Compact between California, Arizona and Nevada, allocating to each in perpetuity the waters that they should be entitled to. This compact Arizona has diligently sought to have made between the three states. One of the chief difficulties as to a division of the waters has always been the waters of the Gila River. California has not been willing, in fact, does not admit, that the 1,000,000 acre-feet (surplus) above mentioned should go to Arizona to take care of the Gila River. If she did, a compact could likely be made. If the Gila River is to be counted as in the Lower Basin and then charged to Arizona, and then the 7,500,000 acre-feet allocated to the Lower Basin are divided among the three states, and then California and Arizona are each to have one-half of the surplus water to be divided, each state would receive 500,000 acre-feet thereof. But if the amount in the Gila is to be counted in the main river, although it never reaches it, then the amount of the surplus is greatly increased and California

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<sup>17</sup>United States, "Hearing before the Subcommittee of House Committee on Appropriations," Second Deficiency Appropriation Bill for 1930, 71st Cong., 2d Sess., 1124.

claiming to be entitled to one-half of the surplus might later make claim that Arizona should surrender a part of its main stream allocation to make up the claimed increase in the surplus waters. Any such theory would prevent the irrigation of any considerable tracts of land in Arizona.

Another difficulty seems to be that while California might agree to some division with Arizona of the 7,500,000 acre-feet allocated to the Lower Basin, yet the 1,000,000 acre-feet of apportioned water, according to California's demands, should remain open to prior appropriation, giving it to the first state which is able to get it. This means California, for the government is advancing them a great many millions of dollars to build the all-American canal, while no such provision is made to carry waters to Arizona lands. But there is another reason why this offer in regard to this 1,000,000 acre-feet should not be considered and that is the theory of a compact dividing the waters between states destroys between them the doctrine of prior appropriation, and no state should be able to secure the benefit of the allocation of water in perpetuity by compact against another state and also maintain as against that state the doctrine of prior appropriation. The two doctrines are not consistent in relation to the division of waters between the two states.<sup>18</sup>

Arizona wished the Tri-State Compact to include the following: (1) Exclude the Gila River; (2) Assume waters to be divided were in main stream of the Colorado; (3) Tri-State Compact was to supplement the Santa Fe Compact; (4) Tri-State Compact was to clarify the provisions of the Boulder Canyon Project Act; (5) Arizona feels that the Governor's Findings at Denver Conference in 1927--and the Boulder Canyon Project Act, are fair to both Arizona and California.

Careful study of the Boulder Canyon Project Act is necessary in order to determine the status of the extra 1,000,000 acre-feet that the Lower Basin is allowed to

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<sup>18</sup>Charles B. Ward, Colorado River Controversy, 9.

use each year under the compact (Article III (b)).

The Act lays down only one definite limitation on water and that condition is briefly as given, i.3. California to restrict her use to 4,400,000 acre-feet of water apportioned by Article III, paragraph (a) of the Colorado River Compact, plus one-half of the excess or surplus waters unapportioned.

The Act also outlines a suggested possible Tri-State compact between Arizona, California and Nevada. This suggested Tri-State compact does not apportion any water to California, but apportions 300,000 acre-feet to Nevada, and 2,800,000 acre-feet to Arizona, and then states that Arizona may have one half of the excess or surplus waters.

No mention is made in either the California limitation laid down in the bill or in the suggested Tri-State compact of the 1,000,000 acre-feet of water mentioned in Article III (b) of the compact. Arizona contends that because this 1,000,000 acre-feet is not mentioned in the Act that the State of Arizona would automatically be given the right to use the entire 1,000,000 acre-feet. In the suggested Tri-State Compact in the Act, Arizona is limited to 2,800,000 acre-feet of water from the 7,500,000 acre-feet and is allowed to use one-half of the excess or surplus (exactly the same language as used in connection with California's limitation in the preceding paragraph of the Act.)

The following table gives the division of water that would result from the assumption of interpretation made by California. Under the provisions of the Boulder Canyon Project Act and the seven-State compact it would seem that the division of water between the three lower basin states would be practically as follows:

California Water--

	acre-feet
Apportioned III (a) water.....	4,400,000
One-half surplus or excess.....	<u>2,050,000</u>
Total -----	6,450,000

(Assuming Arizona and Nevada use balance of water on basis of proposed tri-State compact in Act.)

## Arizona Water--

Apportioned III (a) water .....	2,800,000
One-half surplus or excess .....	<u>2,050,000</u>
Total -----	4,850,000

## Nevada Water--

Apportioned III (a) water .....	300,000
Grand Total -----	<u>11,600,000</u> <sup>19</sup>

The above table gives California's interpretation of the allocation of water between Arizona, Nevada, and California. These facts are drawn from the Colorado River Compact and Boulder Canyon Project Act. Below is given Arizona's proposed water division. These proposals are as follows:

- (1) All tributaries, excepting waters thereof reaching main stream, shall belong to the states where situated, subject to division of interstate tributaries by compact or compact between states respectively interested therein.
- (2) Apportioned water shall be divided, without preference of priority:
 

	acre-feet
To Arizona -----	3,500,000
To California -----	4,700,000
To Nevada -----	300,000
- (3) Surplus water shall be divided equally between Arizona and California, without preference of priority.

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<sup>19</sup>Colorado River Commission of California, The Boulder Canyon Project, pp. 31, 32, 33.



- (4) Tributaries, excepting water thereof reaching main stream, shall be exempt from Mexican burden resting on lower basin, which burden shall be borne and shared equally by Arizona and California from waters of main stream.<sup>20</sup>

A careful analysis of the constitutions of the Colorado River States will reveal the right of the state to the water of their tributaries.

Nevada, in its general laws, Section 1, of the law of 1907 provides:

All natural watercourses and natural lakes, and waters thereof which are not held private ownership, belong to the State and are subject to appropriation for beneficial uses.

California, Section 1410, A. Kerr Cyc Code of California, 1920 provides:

The entire flow of water in any natural stream which carries water from the State of California into any other state is subject to use in the State of California, under the laws of the State of California, and the right may be, so far as not already acquired by use in the State of California, acquired and held under the laws of the State of California. The right to the use of such waters held under the laws of the State of California, shall be prior and superior to any rights to the waters of such streams held under the laws of any other state.

Utah, in Section 1, Article XVII, of its Constitution recognizes the right of the people of that state to its streams.

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<sup>20</sup>A. H. Favour, Arizona's Rights in the Colorado River, 15.

All existing rights to the use of any of the waters in this State for any useful or beneficial purpose are hereby recognized and confirmed.

Colorado, Section 5, Article XVI, of Constitution, provides:

The waters of every natural stream not heretofore apportioned within the State of Colorado is hereby declared to be the property of the public; and the same to be dedicated to the use of the people of this State, subject to appropriation as hereinafter provided.

Wyoming, Section 1, Article VIII, State Constitution, provides:

The waters of natural streams, springs, lakes or other collection of still water, within the boundaries of the State, are hereby declared to be the property of the State.

California and Arizona differ in regards to the allocation of water, by the Colorado River Compact. They also differ in regards to the meaning of "surplus" waters and the use of the water in their tributary. This brings us to the question of the Gila River:

With the exception of the Colorado, the Gila is the most important river in Arizona, its watershed embracing practically the entire region south of the thirty-fifty parallel of latitude in that State, an area of approximately 72,000 square miles.

The sources of the Gila rise among the eastern spurs of the Mogollon Mountains in New Mexico, at an elevation of from 7,000 to 8,000 feet above sea level. This range forms the Continental Divide between the waters flowing into the Gulf of Mexico on the east and the Gulf of

California on the west. Flowing in the generally south-westerly direction, the Gila enters Arizona at latitude 32° 40' north, at an elevation of about 3,800 feet, and following a course westward across the entire State corresponding closely to the thirty-third parallel, finally joins the Colorado at Yuma, at an elevation of approximately 120 feet above the sea level. The distance along the Gila from its source to its confluence with the Colorado is approximately 450 miles.

The principal tributaries entering the Gila between its source and its mouth, with the extent of the respective drainage areas, and the average elevation are shown in the following table:

	Drainage area square miles	Elevations.
Agua Frio.....	1,700	800-3,000
Salt River.....	12,700	1,000-10,000
San Pedro.....	4,000	1,000-5,000
San Carlos.....	1,200	2,400-4,000
San Francisco.....	3,400	3,400-7,000 <sup>21</sup>

An interesting summary of Arizona water contribution through the Gila is here given:

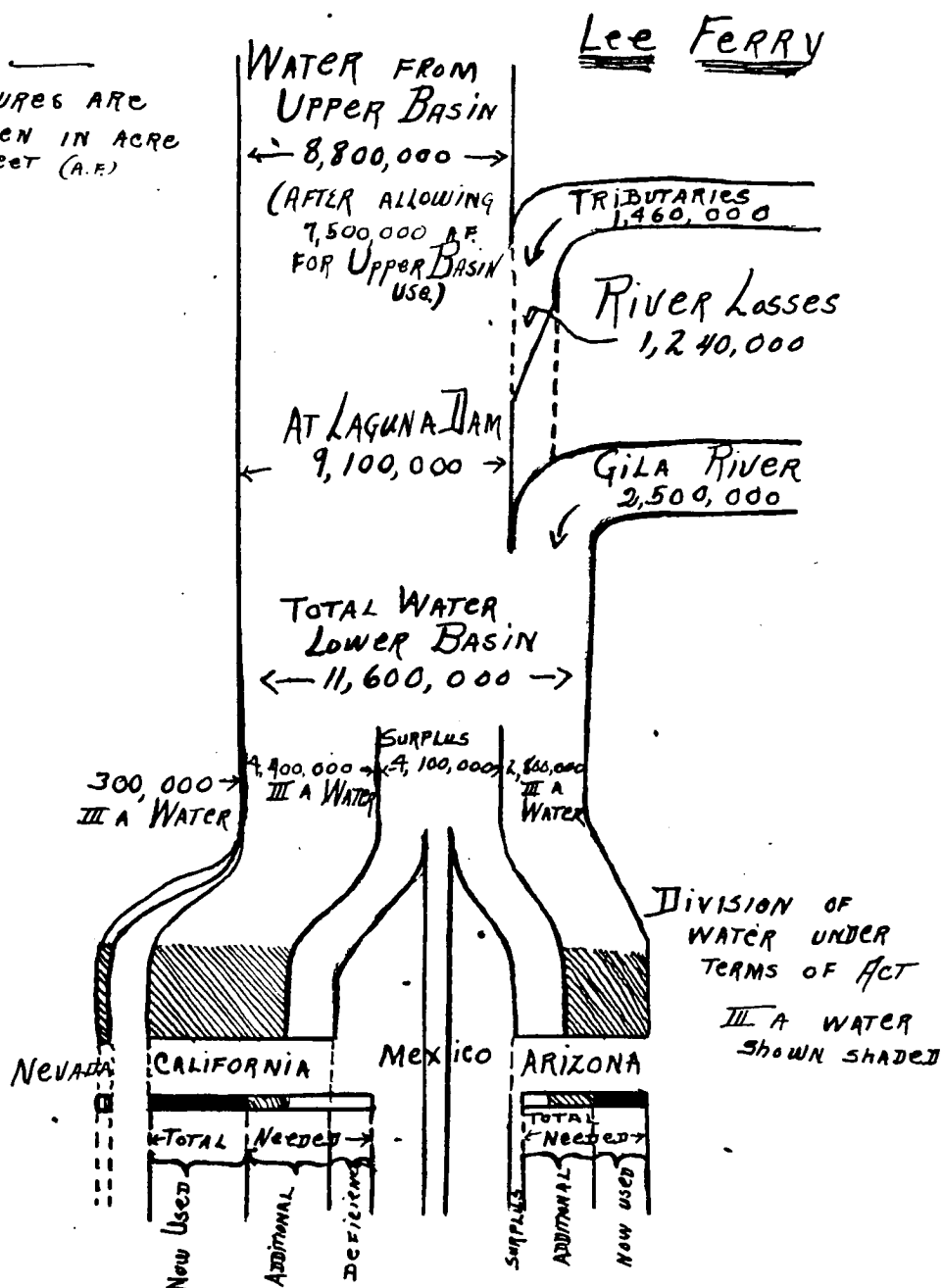
(Average yearly values in acre-feet)

Gila system production -----	2,677,000
Main Colorado River:	
Little Colorado River -----	200,000
Williams River -----	75,000
Other tributaries -----	<u>900,000</u>
	<u>1,175,000</u>
	3,852,000 <sup>22</sup>

<sup>21</sup>United States, House of Representatives, 66th Cong., 1st Sess., Hearings Before the Committee on Indian Affairs, 14.

<sup>22</sup>United States Senate, "Colorado River Development," 70th Cong., 2d Sess., Document No. 186, 81.

Note —  
FIGURES ARE  
GIVEN IN ACRE  
FEET (A.F.)



## COLORADO RIVER WATER LOWER BASIN SYSTEM

WATER AVAILABLE, AND APPORTIONMENT  
UNDER  
BOULDER CANYON PROJECT ACT.

One of the greatest difficulties between Arizona and California in arriving at a common ground between the States, was the use of terms. On March 3d, 1929, the Arizona Commission submitted the following terms or definitions to California:

- (1) Apportioned water shall mean: 8,500,000 acre-feet apportioned to the lower basin by paragraphs "a" and "b" of Article III, Colorado River Compact and shall only include water physically present in the main stream.
- (2) Surplus water shall mean: Unapportioned water physically present and available for division in the main stream.
- (3) Tributaries shall mean: all streams, including the Gila, entering the main stream below Lee's Ferry.

#### Water Division

- (1) All tributaries, excepting waters thereof reaching main stream, shall belong to the states where situated, subject to division of interstate tributaries by compact or compacts between states respectively interested therein.
- (2) Apportioned water shall be divided, without preference or priority:
 

To Arizona -----	3,500,000 acre-feet
To California -----	4,700,000 " "
To Nevada -----	300,000 " "
- (3) Surplus water shall be divided equally between Arizona and California, without preference or priority.
- (4) Tributaries, excepting water thereof reaching main stream shall be exempt from Mexican burden resting on lower basin, which burden shall be borne and

shared equally by Arizona and California from waters of main stream.

- (5) All-American Canal shall not, directly or indirectly, carry any water to or for the use of any lands in Mexico.<sup>23</sup>

On March 7th, 1929, the California commissioners submitted a reply to Arizona's above proposals and set up a basis upon which they were willing to proceed to negotiate a compact. The outstanding features of the California division was that the Gila River was included in the computation. The California reply or counter proposals submitted to the Conference follow:

California does not accept Arizona's proposal as to the division of water. As a counter proposal on that point California offers to enter into a compact with the states of Arizona and Nevada providing for a division of the waters of the Colorado River among said three states upon the basis set forth in the "Boulder Canyon Project Act," such offer being made upon and subject to the following interpretations affecting said act, to wit:

- (a) Such proposed division of waters shall be subject to the Colorado River Compact.
- (b) Of the seven million five hundred thousand (7,500,000) acre-feet annually apportioned to the lower basin by paragraph (a) of Article III of the Compact, there is hereby apportioned in perpetuity the exclusive, beneficial, consumptive

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<sup>23</sup>A. H. Favour, Arizona's Rights in the Colorado River, pp. 5, 6.

use of four million four hundred thousand (4,400,000) acre-feet to California, two million eight hundred thousand (2,800,000) acre-feet to Arizona and three hundred thousand (300,000) acre-feet to Nevada.

- (c) The one million acre-feet of water covered by paragraph (b) of Article III of said Compact shall be deemed subject to appropriation and beneficial use by any of said three states and the right thereby acquired by such appropriation to be governed by the law of prior appropriation of said stream.
- (d) The State of California may annually use one-half of the excess or surplus waters unapportioned by the Colorado River Compact, and the State of Arizona the remaining one-half.

Excess or surplus waters so unapportioned shall be deemed to be all waters of the Colorado River System not covered by paragraphs (a) and (b) of Article III of said Compact.

- (e) The State of Arizona shall have the exclusive, beneficial, consumptive use of the Gila River and its tributaries within the boundaries of said state.
- (f) The waters of the Gila River and its tributaries, except return flow after the same enters the Colorado River, shall never be subject to any diminution whatever by any allowance of water which may be made by Treaty or otherwise to the United States of Mexico, but if, as provided in paragraph (c) of Article III of the Colorado River Compact, it shall be necessary to supply water to the United States of Mexico from waters over and above the quantities which are surplus as defined by said Compact, then the State of California will supply out of the main stream of the Colorado River, one-half of any deficiency which must be supplied to Mexico by the lower basin, and Arizona the other half.

- (g) None of the signatory States shall withhold water and none shall require the delivery of water which cannot reasonably be applied to domestic and agricultural uses.
- (h) As to the proposal that the All-American Canal be not used for delivery of water for Mexico use; that is not a proper subject of concern in framing the proposed pact and should be omitted therefrom.<sup>24</sup>

The Arizona Commission feels that there is no reason justifying the inclusion of the Gila River in the computations of the main Colorado River System, California Commission believes that the Gila River should be included, thus:

On account of topographical conditions in the Lower basin very different conditions exist in California and Arizona. Arizona's richest agricultural district lies to a large extent around and in the Gila River Basin; while California's major area, on which water could be put from the Colorado River, lies in the Imperial and Coachella valleys, and in and around the Blythe District. Both of the California areas can only be watered from the main stream of the Colorado. The Yuma District, a comparatively small portion of which lies in California and the major portion of which lies in Arizona, is of course watered from the main stream of the Colorado.<sup>25</sup>

The third cause for a controversy between the sister states of Arizona and California may be called the "Mexican Burden." Provision is made for Mexican waters in Article III, (c) of the Colorado River Compact.

There are about 200,000 acres of land in Mexico which now use Colorado River waters for irrigation. This land lies mostly on the west side of the river, south of the lands of the California Imperial Valley. The present water use on this land is about 700,000 acre-feet annually. There

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<sup>24</sup>A. H. Favour, Arizona's Rights in the Colorado River, pp. 7, 8.

<sup>25</sup>Colorado River Commission of California, Boulder Canyon Project, 44.



is, roughly speaking, about one-half million acres more that could be irrigated and used if there were water for such lands. The water that Mexico now uses is carried through a canal which has its head gate at Hanlon's heading, a few miles below Yuma, Arizona. This canal carries both the Mexican waters and the waters for the Imperial Valley. Arizona believes firmly that the amount of water which Mexico shall be entitled to use must be settled by a treaty between the United States and Mexico.

The Colorado is an international river and Mexico must be reckoned with by the government. The situation which exists in Mexico is peculiar in that Americans own a large part of all irrigable Mexican land. Mr. George H. Maxwell, long interested in irrigation problems, declares:

Much of the trouble encountered in present plans for development of the Colorado River, arises from the fact that much is being done to attempt to nail the Colorado River down for Mexico.<sup>26</sup>

In a recent study and report made of the Colorado River by the Government the following statement is made in regards to the Mexican situation:

We are advised that any water developed and made available by the United States could not be appropriated and held by Mexico, that this is a general international policy, under the comity of nations, so it is not a matter of concern if

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<sup>26</sup>Hearings House of Representatives "Protection and Development of Lower Colorado River," 68th Cong., 1st Sess., Document 2903, Part VI, 1298.

they do use the stored waters before our States are ready to use their rightful share. Such Mexican use would be subject to American rights.

It is estimated by students of the problem that there will be enough unallocated water under the compact to satisfy Mexico's needs, but even if there was no surplus nothing could be gained by delay, because more appropriations are being made and put to beneficial use in Mexico and nothing but development in the United States will prevent this being done.

Mexico has at this time, it is estimated, about 200,000 or 225,000 acres in cultivation, and she may be allotted sufficient water for this amount.<sup>27</sup>

Arizona feels that it is highly desirable to reach a satisfactory treaty with Mexico before any storage plans develop in the United States. The following statement was presented to the House of Representatives by Lewis Douglas, Arizona's representative:

The 5,000,000 acre-feet must, therefore, be permitted to flow into Mexico, there to be applied to beneficial use. Regardless of international rights to waters in an international stream, as a matter of comity between nations it is impossible to take water which has once been applied to beneficial use on foreign soil. There is no treaty between the two countries relative to the waters of the Colorado River, nor is there in this measure any specific provision which places Mexico upon notice with reference to waters of the Colorado River, in excess of waters now applied to beneficial use in Mexico, as being for use solely within the United States. It follows therefore that once Mexico has applied to beneficial use, and I contend that that country will apply to beneficial use the 5,000,000 acre-feet of the waters of the Colorado River, this country can never use such waters for the benefit of its own citizens.<sup>28</sup>

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<sup>27</sup>United States, "Colorado River Development," 70th Cong., 1st Sess., Senate Document 186, 23.

<sup>28</sup>Lewis Douglas, House of Representatives, 70th Cong., 1st Sess., Minority Views, 41.

In the letter of the Federal Power Commission, signed by John W. Weeks, Secretary of War, Hubert Work, Secretary of the Interior and Henry C. Wallace, Secretary of Agriculture, the paragraph dealing with Mexico confirms Arizona's contention as follows:

The regulation of the Colorado River to the extent proposed by the Boulder Canyon Dam will produce in the lower river a minimum discharge far in excess of present irrigation requirements in the United States. The surplus waters will pass into Mexico and will undoubtedly be put to use for irrigation there. Once put to use, their subsequent withdrawal for use elsewhere would be difficult, if not impracticable. It would therefore seem highly desirable to reach a general agreement with Mexico on the problem of the lower river before extension storage is provided in the United States. The construction of the All-American canal will not obviate the necessity of constant dealings with Mexico in connection with irrigation or protection of lands in the United States. Irrespective of the amount of flood-control storage in the United States it will for many years, at least, be necessary in the protection of the Imperial Valley to maintain levees and revetments in Mexico, and arrangements must be effected whereby this work can be carried on whenever necessary without interference.<sup>29</sup>

There is another phase of this problem of the Mexican question that should be reviewed at this time; namely, the relationship between the Imperial Valley Irrigation Compact and the Government of Mexico:

The interest of Mexico in the Colorado is immediate and vital. The California Development Company, appropriated, under the Laws of California, 10,000 second-feet and thereafter entered a contract with the Mexican Government permitted it to construct and maintain canals through Mexican territory in which water was carried back to the Imperial Valley in California. In consideration of this right the company agreed to furnish for lands in Mexico water up to one-half of its total appropriation of 10,000 second-feet. As a result of this

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<sup>29</sup>Lewis Douglas, House of Representatives, 70th Cong., 1st Sess., Minority Views, 41.

contract, about 200,000 acres in Mexico have been put under cultivation, and possible 500,000 more acres may be developed. This canal system is now controlled by the water users of the Imperial Valley.

The United States was not a party to this contract, is not bound by it, nor is it in any way responsible for the operations conducted under the contract.<sup>30</sup>

Thus we find that this river is of much interest to the people of the United States; it presents a grave interstate problem; and lastly, the Mexican question resolves itself into an international situation which must be settled by the government before development of the project takes place.

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<sup>30</sup>United States, "Hearings Before the Committee on Irrigation and Reclamation," 70th Cong., 1st Sess., S. 728 and S. 1274, 431.

## CHAPTER IV

## ECONOMIC DEVELOPMENT OF THE COLORADO RIVER

The problem of the economic use of the waters of the Colorado River, as well as the best method of curbing and controlling its wild nature, has caused a discussion which has covered a long period of time. If we analyze the plan for development we note the following four proposals made, in order of their importance: (1) Flood control, for the Imperial Valley; (2) Irrigation; (3) Silt control; (4) Production of power. It is proposed to construct the largest dam in the world, at the site of Boulder Canyon; build a large power plant near the dam; and build an all-American Canal through Imperial Valley.

Few people realize the magnitude of this very important undertaking. An interesting comparison of the Boulder Dam was given by Senator Johnson in his address before the Committee on Irrigation and Reclamation, April 19, 1926:

The magnitude of the proposed Boulder Canyon Dam can only be appreciated by comparison with present existing works of like character. The highest dams now in existence stand from 250 to 350 feet above bedrock, while the Boulder Canyon Dam will consist of a solid concrete structure towering 582 feet above its foundations and braced between solid rock walls. Some of the great reservoirs in the world are the Assuan, of Egypt, with 1,865,000 acre-feet capacity; the Elephant

Butte, of New Mexico and our Reclamation Service, with 2,368,000 acre-feet capacity, and the Gatun Lake on the Panama Canal, with 4,410,000 capacity, while the proposed Boulder Canyon storage will have approximately 30,500,000 acre-feet. . . . The hydro-electric power which will be generated from the contemplated new work will equal 550,000 firm horsepower continuously, with a 1,000,000 horsepower installed capacity--a capacity equal to the total capacity of all the Niagara plants now operating, an installed capacity 50 per cent greater than Muscle Shoals, and with a capacity and firm horsepower six times greater than that contemplated at Muscle Shoals. Careful estimates demonstrate that the Boulder Canyon project will save 23,000,000 barrels of oil yearly, and when it is recalled that the United States Geological Survey warns us that the oil supply of America at the present rate of consumption may be completely exhausted in 20 years, the importance of this saving can not be over estimated.<sup>1</sup>

The magnitude of the Boulder Canyon Dam is illustrated by the following data:

Raise in water surface, river surface of stored water in reservoir, 582 feet for 30,500,000 acre-feet storage.  
 Elevation bed rock, 520 feet.  
 Elevation top of dam, 1232 feet, for 30,500,000 acre-feet storage.  
 Elevation low water surface in river, 647 feet approximately.  
 Elevation maximum water surface during 1921 flood, 681 feet approximately.  
 Total height of dam, bed rock to top of dam, 712 feet for 30,500,000 acre-feet storage.  
 Height of dam, river bed to top of dam about 587 feet.  
 Length of lake formed by stored water, 100 to 125 miles.  
 Amount of concrete in dam, power plant and appurtenant works, 4,500,000 cubic yards.  
 Barrels of cement in dam 5,500,000.  
 Pounds of reinforcing steel in dam, 19,000,000.  
 Length of time required to build, 6 to 8 years.  
 Nearest town, Las Vegas, Nevada, about 30 miles by road, 25 miles direct line.

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<sup>1</sup>Hiram Johnson, United States Senate, 69th Cong., 1st Sess., Document No. 666, 4.

Railroad to dam, to be built and owned by Government.

About 30 miles long from Los Angeles and Salt R. R.

Area flooded by stored water (27,000,000 acre-feet),  
135,000 acres.

Area flooded by stored water (30,500,000 acre-feet),  
150,000 acres.

Cost--as estimated by Sibert Board:

Dam and Reservoir (26,000,000 acre-feet	\$70,600,000 00
1,000,000 h.p. power development -----	38,200,000 00
All-American Canal -----	38,500,000 00
Interest during construction -----	17,700,000 00

Total -----	\$165,000,000 00
Additional for Coachella Canal -----	11,000,000 00

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\$176,000,000 00<sup>2</sup>

There is no dispute among the states as to the necessity for flood control, drought prevention and silt elimination for the Imperial Valley. It is believed by many who have studied the question of flood control that this issue was very much overdrawn; in so doing to obtain support for the bill throughout the other parts of the United States.

Charles F. Stern, Executive Vice-President of the Security-First National Bank of Los Angeles, made a careful study of the conditions in the Imperial Valley, he said:

It is a matter of fact that the Colorado River as it pertains to the Imperial Valley never was a matter of

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<sup>2</sup>Colorado River Commission of California, The Boulder Canyon Project, pp. 22, 24.

fatal danger, and at no time in history has the Valley been as safe as it is to-day.<sup>3</sup>

On March 1924, A. B. West, President and General Manager of Southern Sierras Power Company, made the following statement:

Now, the situation is entirely different (from that of 1906) these levees (which protect the Imperial Valley) are revetted from end to end with heavy rock; there are standard gauge railroad tracks built along the levees; there is a big quarry at Hanlon's Heading, at Pilot Knob, where they keep trains loaded all the time with heavy rock that they can rush down to any point where a break occurs.... Under the conditions as they exist today, the engineers will have two or three weeks' notice of a flood coming down the river. For instance, at Bright Angel Station the Government has a station from which, if a flood starts on the Colorado River, word is sent by telegraph at once.<sup>4</sup>

Colonel William Kelly, U. S. A. chief Engineer, expressed his opinion in regard to the flood danger thus:

. . . . So that I think the danger of being unable to shut the river out of there has been greatly magnified. I believe that permanent inundation could always be prevented, but the expense would be material.<sup>5</sup>

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<sup>3</sup>Charles F. Stern, A Study of the Problems of the Imperial Valley, 10.

<sup>4</sup>A. B. West, United States, House of Representatives, Document 2903, Part IV, p. 630, March 1924.

<sup>5</sup>Colonel William Kelly, op. cit., pp. 1234, 1235, April 15, 1924.



It should not be questioned, however, that the most urgent need of the basin is flood protection of cities, towns, and large irrigated areas near Yuma and the Imperial Valley. Property values exceeding \$100,000,000 and the prosperity of many thousand people on both sides of the international boundary are seriously menaced. As the Colorado River carries its burden of silt to the Gulf of California it is constantly building up its bed across the delta, making necessary a corresponding periodic increase in the height of the levees built to confine it. The flood menace is, therefore, perhaps increasing yearly, and the maintenance of the levees is becoming more difficult and costly as time goes on.

The Colorado River carries a great quantity of silt and is one of the muddiest rivers of the world, annually depositing more than 100,000 acre-feet of silt per year at its delta. This great silt deposition and consequent continuous raising of the bed of the river in its lower reaches, is the primary cause of a constant flood menace to the low-lying agricultural lands in Arizona and California. In order that the silt may be trapped and the flood waters stored for beneficial use, it is desirable to construct one or

more impounding reservoirs of large capacity at suitable locations on the up-stream. Investigations of the United States Reclamation Service at Yuma indicated:

The annual silt burden carried by the river to be about 100,000 acre-feet, later investigations by the United States Department of Agriculture at Topock added larger allowances being made for bed silt or silt waves traversing the bottom of the stream. Attention may be called to the fact that the volume of such silt waves is often sufficient to convert a deep open channel into a sand bar in a comparatively few hours. .... The acute danger to the Imperial Valley is, therefore, not only from the floods of water, but also from the floods of silt brought down by the normal flow of irrigation water. The silt menace will continue for several years after the impounding reservoir is constructed, as the desilting water will again pick up previously accumulated bed silt until the flow below the dam scours a comparatively clean channel.<sup>6</sup>

The Colorado River runs largely through an arid country, one of its most valuable potentialities is the irrigation of agricultural lands. It will be of interest to review some of the statements made by citizens of the different river basin states and have an impression of the economic needs in each.

Mr. Tobin, of Colorado, expresses the opinion of that state:

I think I speak frankly and honestly in regard to my own section, that of Montrose, San Miguel, Dolores and Ouray counties. We are fifty per cent developed at

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<sup>6</sup>United States Senate, "Hearings before the Committee on Irrigation and Reclamation," 70th Cong., 1st Sess., Document 728, 420.

the present time, and as far as water is concerned, under the actual condition why should we not have the water for our future development? We contend as American citizens that we are entitled to all that we can use beneficially, and consequently that is why we stand on the proposition that the waters belong to the state of Colorado, and if properly appropriated and properly used, and put to a beneficial use, the steady flow in the Colorado River will be thereby increased.<sup>7</sup>

All of the Upper Basin States realize that the Colorado River is one of the West's greatest natural assets and the development of each state and progress in the future will go hand in hand with the development of this great river. Irrigation is vital to the progress of these arid states.

In the Lower Basin States, we find that there is almost an urgent necessity for the development of this river. The State of California, although having the smallest amount of land within the Basin, has the largest interest, both as to irrigation and power. Nevada cannot use much water or power at this time. Arizona has some need of water but little need for power; in the future the demand will be greatly increased.

It is well to contrast the economic conditions in Arizona with those in her sister state California. We find them to be very different; California is

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<sup>7</sup>Colorado River Commission, Grand Junction  
Hearing, 76, March 29, 1922.

extremely rich, while Arizona is relatively poor, due to her lack of natural resources. Mr. John F. Stevens, who has made a thorough study of the economic conditions of Arizona, says:

The State of Arizona is relatively poor. Much of its area is taken up by mountains of little or no value agriculturally, and of problematic value as producing minerals. She has thousands of acres of desert lands which for topographical reasons can probably never be irrigated. Large areas within its boundaries are occupied by Indian Reservations, over which it has no control and derives no revenue. Its lands which can be made of agricultural value are desert and can become an asset only by the application of water through irrigation. She has nearly a million and a half acres of choice arable desert land, about twice the area of the State of Rhode Island, land and water included, which lie immediately adjacent to the Colorado River, and which are well located for natural irrigation, and can be so irrigated when the need for such irrigated land becomes apparent, providing she can retain the use of her own water for the purpose. These lands are now frozen assets, but will be of immense value to her in the future if she can hold what is entirely her property until such time as she can realize. The State asks no charity and no consideration beyond what is her due in strict justice.<sup>8</sup>

The Colorado River is considered as the greatest natural resource of Arizona. In Arizona this river and the State's agricultural future are synonyms. They are one and inseparable. Without the Colorado River and its tributaries within the State agriculture can have no future worthy of the name. So it is that the Colorado is often referred to and is regarded, in Arizona, as the

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<sup>8</sup>John F. Stevens, The Matter of the Colorado River, 24.

State's greatest undeveloped resource.<sup>9</sup>

Much controversy has arisen between California and Arizona in regard to the development of power which will be generated at the Boulder Canyon Dam. California is the only state in the Lower Basin that can use an amount of power at this time. In Nevada and Arizona no urgent need is present:

At the present time there is no urgent need in Arizona for the development of the Colorado River. In California the need is urgent, both for power and for late summer water supply. The power projects of the Salt and Verde Rivers should be further developed before the construction of any Arizona project on the Colorado, and, because of the high cost of long distance transportation, Colorado River power can not be sold in central and southern Arizona at so low prices as power from the Salt and Verde. So long as present prices of fuel oil prevail, Colorado River power cannot compete with steam power.<sup>10</sup>

In Section VIII (b) of the Boulder Dam Project Act we find the provision for power, thus:

Also the United States, in constructing, managing, and operating the dam, reservoir, canals, and other works herein authorized, including the appropriation, delivery and use of water for the generation of power, irrigation or other uses, and all users of water thus delivered and all users and appropriators of waters stored by said reservoir and or carried by said canal, including all permittees and licensees of the United States or any of its agencies, shall observe and be subject to and controlled, anything to the contrary herein notwithstanding,

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<sup>9</sup>United States Senate, "Hearing before the Committee on Irrigation and Reclamation," 70th Cong., 1st Sess., S. 728 and S. 1274, 36.

<sup>10</sup>G. E. P. Smith, A Discussion of Certain Colorado River Problems, 145.

by the terms of such contract, if any, between the States of Arizona, California, and Nevada, or any two thereof, for the equitable division of the benefits, including power, arising from the use of water accruing to said States, subsidiary to and consistent with said Colorado River compact, which may be negotiated and approved by said States and to which Congress shall give its consent and approval on or before January 1, 1929; and the terms of any such compact concluded between said States and approved and consented to by Congress after said date: Provided, That in the latter case such compact shall be subject to all contracts, if any, made by the Secretary of the Interior under section hereof prior to the date of such approval and consent by Congress.<sup>11</sup>

The most important survey and report of the development of the Colorado River, was made by the Board appointed by the Government. This is known as the Sibert Board Report and it submitted its finding on December 3, 1928, to Congress. In regard to power, the following data was given:

Based on the foregoing estimates of the variation of flow of the Colorado River, it is believed that under present conditions of irrigation a continuous output of 550,000 horsepower, or 1,000,000 horsepower on a 55 per cent load factor, could be maintained even during the years of normal low flow.

A fairly rapid irrigation development is, however, to be expected in the entire Colorado River Basin, provided the seven States compact is consummated, and if the Boulder Canyon project is undertaken, preparations for such development may be expected in both the upper and lower basins during the construction of such project.

As the use of water for irrigation increases, the amount of water available for power will decrease, and a time will arrive when, during periods of low water, the full estimated amount of power can not be maintained. Within a 30 or 40 year period, even with a re-regulating reservoir the power output may be reduced to five-tenths or six-tenths

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<sup>11</sup>Boulder Canyon Project Act, Section VIII, (b) 7.

of the capacity of the proposed plant during a long dry period.

. . . . In any event, the upper basin has, by virtue of its location, first call on the water of the river. The withdrawal of the allotted share of the annual flow during any series of years of low flow may make it impossible to carry out the terms of the compact during the latter part of a low 10-year period. If the low flow continued for a considerable term of years the proposed storage at Boulder Dam would be inadequate to provide sufficient water for the lower valley through such a period. The power output would also be seriously affected and might be reduced below the estimated minimum previously stated.

A 1,000,000-horsepower hydroelectric plant fully loaded and operating continuously on a 55 per cent load factor would generate annually 3,600,000 kilowatt-hours of current. In actual practice this theoretical output might be reduced by approximately 10 per cent.<sup>12</sup>

In the beginning of the controversy between California and Arizona the main issues seemed to center around the division of water, Article III, (a) and (b); of the Colorado River Compact; later one of the most important differences between the sister states was the question of power:

It was assumed at the outset of the negotiations that Arizona was primarily interested in a division of water, but as the negotiations proceeded, it developed, and has now been pretty firmly established, that what Arizona seems to be principally interested in is revenue from power.

At the last conference with Arizona, held in Phoenix, February 9, 1930, the statement was made by Mr. Ward,

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<sup>12</sup>Report of the Colorado River Board on the Boulder Dam Project, House of Representatives, 70th Cong., 2d Sess., Document No. 446, 14.

Chairman of the Arizona-Colorado River Commission, that Arizona will not sign any compact which has to do with water alone.<sup>13</sup>

The Arizona position on this question of revenue is based on the power given the States of California, Nevada, and Arizona, and under section VIII (b) of the Boulder Dam Project Act. The Act has attempted to harmonize many ideas and theories in regard to the benefits to the States, and there has succeeded one provision after another, many of which are conflicting. In order that there might be no question hereafter raised, or that controversial matters might be reduced as far as possible, Arizona has seen fit to ask that a compact, on questions of revenue, be made, clarifying the ambiguities, defining the meanings, and harmonizing different sections. These are set out in the twelve proposals that Arizona makes, as follows:

Revenue Proposal No. 1. "The Project shall be constructed, maintained and operated by the United States with the purpose not only of repaying federal advances within fifty years, but also of providing the greatest reasonable returns meanwhile to Arizona and Nevada.

To the foregoing proposal, California made answer as follows:

To make 'providing the greatest reasonable returns' to Arizona and Nevada during the amortization period a main or primary purpose of the construction, operation and maintenance of the project would render the legislation of questionable validity, and no doubt would antagonize Congress and cause rejection of the Compact.

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<sup>13</sup>Colorado River Commission of California, The Boulder Canyon Project, 44.



Arizona's revenue proposal No. 2. is as follows:

Contracts for electrical power shall provide greatest practicable returns consistent with competitive conditions in available markets, with periodic readjustments as provided in the Act to effectuate such intent.

To the foregoing, California made reply as follows:

The policy of requiring contracts for power to 'provide greatest practicable return' regardless of other considerations would be calculated to give monopolistic control of the power of the project and of the power from other developments on the river. The Secretary should have sufficient discretion to protect the general public.

Arizona's proposal No. 3:

Power transmission costs from dam to available market shall be under control of the Secretary and kept within reasonable limits as a condition to granting power contracts.

California answered the foregoing proposal as follows:

As to the control by the Secretary of power transmission costs, a slight rewording of the provision would probably render it acceptable; however, the costs of steam standby should be included.

Arizona's proposal on revenue, No. 4:

Any dam or dams, other than the project, in the lower basin shall be constructed, maintained and operated with like purpose and under like conditions, as herein provided for the project, the benefits accruing from any such dam or dams to be controlled by the compact between interested States of the Lower Basin.

California answered the foregoing:

Provisions for 'any dam or dams, other than the project' would be foreign and practically impossible to formulate in connection with said Act. Besides the meaning or effect of this item is not sufficiently definite or clear.

Arizona's revenue proposal No. 5:

Power from any such other dam or dams shall not be deemed or handled as competitive with power produced by the project in determining charges for power from the project.

To the foregoing, California replied as follows:

The same objections are made as in the case of Item (4).

Arizona's revenue proposal No. 6:

Charges for the storage and delivery of domestic water shall be on an acre-foot basis, not less than \$2.00 per acre foot, subject to periodical readjustment, as above stated, for the purpose of keeping such charges on a basis commensurate with the value of the storage and delivery facilities afforded by the project.

To this Revenue Proposal, California answered as follows:

As to the proposed minimum charge of \$2 on domestic water; any guaranteed minimum or other charge for storage and delivery of domestic water to produce revenue in excess of amount to be provided under Section 5 of the Act, to-wit--for operation, maintenance, depreciation, interest and amortization, would be contrary to the Act, and besides, would be unjust and unreasonable.

There is no objection to the Compact providing that under the terms of the Act said charges should be such as in the judgment of the Secretary of the Interior will yield a sum equal to a full, fair, proportional part of the total revenues from all sources which will cover, in respect to the storage and delivery of water, all expenses of operation and maintenance incurred by the United States and the payments to the United States under subdivision (b) of Section 4.

However, if the policy of a minimum charge on domestic water is to be established, it should not exceed \$1 per acre-foot.

Arizona's revenue proposal No. 7:

All water taken from the project for use outside of the Colorado River Basin, except water diverted for Imperial and Coachella Valleys, shall be deemed to be for domestic use.

To this proposal, California answered:

As to the proposal to make charges for storage and delivery of water for irrigation use outside the Basin on the same basis as water for domestic use; as California is to have her share of the river waters set apart for use solely in that state, the question of charges for different uses of such water concerns only that state and the Government in providing storage and delivery service.

Arizona's revenue proposal No. 8:

Ample opportunity shall be afforded by the Secretary to interested States to participate, in an advisory way, and to be heard upon all matters of construction, maintenance and operation of the project and in the making of contracts for power and domestic water, to the end that the financial returns from the project to Arizona and Nevada shall be as great as reasonably practicable.

California answered as follows:

Provision for advisors from interested states would be obnoxious to the Secretary of the Interior and probably not be approved by the Congress. The limited extent to which Congress might sanction such a policy is indicated in Section 16 of the Act.

Arizona's revenue proposal No. 9:

After repayment of government advances, charges for storage and delivery of water shall cease, and the revenue of the project shall be divided equally between Arizona, Nevada and Colorado River Basin Fund mentioned in the Act.

The answer of California is as follows:

As proposed division of revenue from project after amortization; Congress has plainly indicated in Section 5 of the Act that it is unwilling to make further declaration on this subject at this time.

Arizona's revenue proposal No. 10:

The period for Arizona and Nevada to make contracts for electrical energy up to 75,000 H.P. shall be

enlarged to five years provided, the party contracting shall assume all obligations to the United States therefor, and release all parties previously obligated.

To this proposal California was as follows:

As to the proposal that Arizona and Nevada be given a five year right or option on a large portion of the power of the project; this would involve an attempt by interstate pact to amend the Act, and is, therefore, objectionable; Besides, such a provision would seriously interfere with the disposal of the power by the Government under the most advantageous conditions.

Arizona's revenue proposal No. 11:

The proposed lower basin compact shall express the sense of the signatory states that the Act imposes no interest charge upon the project on account of flood control and, subject to the consent of Congress, that the project should be relieved of any burden of principal or interest on account of flood control.

The California answer is as follows:

As to the proposed elimination of repayment to the Government of the item of \$25,000,000 for flood control and expressing the view that the Act imposes no interest on that item. These are matters resting solely within the legislative powers of Congress and no attempt to cover them by interstate agreement should be made. The proper method of making the attempt, if made at all, would be by direct amendment of the Act.

Arizona's last Revenue Proposal No. 12:

The accomplishment of the foregoing intents and purposes shall be effectuated and safeguarded by reasonable interpretations of the Act, or necessary changes therein, to be incorporated in the compact, and accepted by Congress.

The California position is stated in its reply:

As to the proposal to effectuate certain intents and purposes of the Act by interpretations or changes; This is also outside of the proper scope of the proposed Tri-State agreement.

The above revenue proposals by Arizona and the counter proposals by California were submitted to the Tri-State Conference in progress, August, 1929.

It is necessary to consider the third state interested in power and revenue. This state is Nevada. In the beginning of the controversy Nevada stood with Arizona, but later, Nevada felt that the location of the dam at Boulder Canyon, was more necessary to her future progress. The following statement by George W. Malone, state engineer of Nevada and Secretary of the Colorado River Commission:

California's interest is, of course, in the fact that the power, domestic water, and a large portion of the water for irrigation is used to develop her State.

Arizona's interest is that a large portion of the water will go to develop her State, the records show that she has 891,000 acres to be developed through this project; and that her natural resource is being utilized by this development.

Nevada's interest is that she has a very small amount of land, approximately, 80,000 acres, that may be irrigated, and that she may obtain cheap power near the development; this will also obtain in Arizona; however, this is limited because when small blocks of power are transmitted any distance transmission costs make it an uneconomic procedure; and that her natural resource is being utilized for the development of this project.

The commissions of the seven States have agreed upon one point, and that is that Nevada and Arizona should benefit from the development by virtue of the site being located within their borders; it is only left

to determine the method by which this can be accomplished.<sup>14</sup>

But Nevada frankly desired the construction of the dam at Boulder Canyon. Thereafter Nevada's whole concern was for the passage of the measure, and the tendency of the Nevada influence was to modify and reduce the Arizona claims.

The purpose of the Governors' Conference, which was called in Denver, Colorado in 1927, was to bring about an agreement which would result in a seven-state ratification of the Colorado River Compact and permit development of the Colorado River. The Governors of all of the states of the Colorado River Basin were in attendance, together with the Colorado River Commissioners, Interstate Water Commissioners, and various advisors of the respective States.

Full opportunity was afforded by the Conference for the Lower Basin States to present their claims and state their positions. The main discussions revolved about the questions (1) of a division between the State of Arizona, California, and Nevada of the waters of the Colorado River System available to the States of the Lower Division; (2) the limitation to be placed upon the Republic of

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<sup>14</sup>George W. Malone, Hearings before the Committee on Irrigation and Reclamation, 70th Cong., 1st Sess., S. Doc. 728, 395.

Mexico as to its right to waters of the Colorado River; (3) the ownership of the States in and to the bed and banks of navigable streams; their right to control the appropriation, distribution and use of waters within their borders, and to compensation for the use of their land and water employed in federal government projects; (4) the extent of the benefits to accrue to the States in the case of power development in the river by the federal government, and division of such benefit between States whose land and waters are jointly used in any such development.

Briefly, it may be said that questions (2) and (3) were resolved, to the extent that they might be resolved by the Conference, to the entire satisfaction of Arizona's representatives and in complete accord with the views by them advanced.<sup>15</sup>

A resolution was adopted by the Conference, declaring adherence of the Seven States of the Colorado River Basin to the policy that waters of the Colorado River stored on American soil should be for the benefit of American lands and interests; that Mexico should

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<sup>15</sup>First Report of the Colorado River Commission of Arizona, Eighth Legislature, 4th Special Sess., Document No. 1, 5.

acquire no right, legal or moral, to the use of such stored waters; requesting the president and the State Department of the United States to act promptly in the matter of effecting a treaty with Mexico.

No final determination was arrived at with respect to the division of water. A closer approach to bring the claims of California and Arizona into accord than ever before came as a result of the Governor's Conference.

California's representatives first proposed that the division of waters be left to a board of engineers composed of a representative of each of the seven States and two representing the federal government. The futility of this plan of procedure was soon shown. California then offered the proposal; after first giving to each State an amount of water sufficient to take care of present vested rights, and 300,000 to Nevada, the main stream then be divided equally between California and Arizona, and that Arizona's tributaries, to the extent that they can be utilized by diversion from such tributaries before their waters enter the main channel, be given to Arizona. Discussion showed under this plan that California would have the far greater part of the water,



and Arizona would bear the largest part of the Mexican burden.

Arizona proposed an equal division of the waters of the main channel, between the States of California and Arizona, after allocation of 300,000 acre-feet to Nevada, and the retention for Arizona's use of the waters of her tributaries.

The Governors of the States of the Upper Division of the Colorado River System, suggest the following as a fair apportionment of water between the States of the Lower Division, subject and subordinate to the provisions of the Colorado River Compact.

1. Of the average annual delivery of water to be provided by the States of the Upper Division at Lee Ferry under the terms of the Colorado River compact.

- (a) To the State of Nevada, 300,000 acre-feet.
- (b) To the State of Arizona, 3,000,000 acre-feet.
- (c) To the State of California 4, 200,000 acre-feet.

2. To Arizona, in addition to water apportioned in subdivision (b) 1,000,000 acre-feet of water to be supplied from the tributaries of the Colorado River flowing in said State, and to be diverted from said tributaries before the same empty into the main stream. Said 1,000,000 acre-feet shall not be subject to diminution by reason of any treaty with the United States of Mexico, except in such proportion as the said 1,000,000 acre-feet shall bear to the entire apportionment in (1) and (2) of 8,500,000 acre-feet.

3. As to all water of the tributaries of the Colorado River emptying into the River below Lee Ferry not apportioned in paragraph (2) each of the States of the Lower Basin shall have the exclusive beneficial consumptive use of such tributaries within its boundaries before

the same empty into the main stream, provided, the apportionment of the waters of such tributaries situated in more than one state shall be left to adjudication or apportionment between said States in such manner as may be determined upon by the States affected thereby.

4. The several foregoing apportionments to include all water necessary for the supply of any right which may now exist, including water for Indian lands in each of said States.

5. Arizona and California each may divert and use one-half of the unapportioned waters of the main Colorado River flowing below Lee Ferry, subject to future equitable apportionment between the said States after the year 1963, and on the specific condition that the use of said waters between the States of the lower Basin shall be without prejudice to the rights of the States of the Upper Basin to further apportionment of water as provided by the Colorado River Compact.<sup>16</sup>

Upon the reconvening of the conference, Arizona, on September 22, presented a reply accepting the proposal of the Governors, conditioned upon modification of the Paragraph (2) and (3). The following re-wording was proposed:

2. The States of the Lower Basin respectively shall have the exclusive beneficial consumptive use of the tributaries within their boundaries before the same empty into the main stream, provided, the division of the waters of such tributaries situated in more than one State, shall be left to adjudication or apportionment between said States in such manner as may be determined by the States affected thereby.

3. The 1,000,000 acre-feet of water allocated to the States of the Lower Basin by paragraph (b) of Article III of the Colorado River Compact, shall be deemed to attach exclusively to the Arizona tributaries of the Colorado River, and to be included in the waters of such tributaries allocated to Arizona under the term, of paragraph (2) hereof, to be diverted from said tributaries before

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<sup>16</sup>Governor's Findings, Denver Conference, August 1927.

the same empty into the main stream. Any allocation of water made to the Republic of Mexico shall be supplied out of water unapportioned herein and if it shall be necessary at any time for the lower basin to supply any water to Mexico the same shall be supplied by California and Arizona out of the water allotted to them from the main Colorado River in equal amounts.<sup>17</sup>

Arizona accepted the proposal in principle, while insisting upon the use of language which would remove all doubt as to her tributaries being relieved of the burden of supplying any water that might hereafter be allotted to Mexico, and upon the insertion of a clause giving to the states of California and Arizona the right to use, without prejudice to the upper states, the unallotted water in the main stream of the Colorado and to divide such waters on a 50-50 basis. Arizona accepted the Governor's Finding in 1927, but California rejected the proposal.

As California has understood Arizona's attitude in connection with the Tri-State negotiation, if Arizona's proposals were to be adopted they would in effect amend the existing Santa Fe Compact and would also contain provisions which would clearly modify the conditions laid down by Congress in the Boulder Canyon Project Act. For these reasons California felt justified in refusing the above proposals of Arizona.

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<sup>17</sup>Colorado River Commission of Arizona, The Colorado Question, pp. 11, 12.

California, anxious to make one more effort to bring about an agreement, made the following proposal for the division of the waters of the lower Colorado River to Arizona, on February 8, 1930:

To Nevada, 300,000 acre-feet of water.  
Utah and New Mexico to have all water necessary for use on areas of those states lying within the lower basin.

Arizona to have all waters of the Gila System and her other tributaries, excepting such water as reaches the main stream, also her present uses from the main stream, within the State.

California to have water now diverted in California for agricultural and domestic use in California.

Balance of water in main stream to be divided one-half to Arizona and one-half to California.

Mexican obligations to be met one-half by Arizona and one-half by California from main stream water.

All other points to be left to determination of the Secretary of the Interior, under the Act.<sup>18</sup>

This is the last proposal submitted by either Arizona or California and this proposal on water has neither been accepted nor rejected by Arizona. At the last conference held between the States, Arizona refused to outline or submit a proposal covering all of the matters which she said were necessary in order to reach an agreement.

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<sup>18</sup>Colorado River Commission of the State of California, The Boulder Canyon Project, 45.

However, in October, 1930, the State of Arizona filed a bill of complaint in the United States Supreme Court, to test the constitutionality of both the Colorado River Compact and the Boulder Canyon Project Act.

## CHAPTER V

### CONCLUSION

There is no dispute among the states as to the necessity for flood control, drought prevention and silt elimination for the Imperial Valley in California. All of the other six states in the Colorado Basin have repeatedly shown their willingness to contribute their storage facilities to relieve California of the expense of these items. Every state in the basin has plans for more irrigated acres, for more dams and storages. The known industrial and domestic needs are immeasurably greater than was thought possible a quarter of a century ago. Without proper regulation the lower river has little value.

Dr. Elwood Mead, of the Reclamation Service has stated that the laws of six of these states are in harmony, in that they recognize the right to appropriate this water, take it out and apply it to beneficial uses on both riparian and non-riparian lands. The methods of determining how much water is beneficially used and the means employed to regulate diversions are not the same in each of the states, but they have

a general agreement as to principles. California is different. That state has sought to retain the modified common-law doctrine of riparian rights and at the same time to enact and put into operation a code of laws recognizing appropriations by beneficial use. The doctrine of riparian rights is wholly unsuited to the conditions of an arid region, and the two rules of law can not exist without inevitable conflict. The benefits which come from the irrigation of non-riparian lands make the riparian doctrine war continually with the requirements of efficient development.<sup>1</sup>

In 1920, Congress, by the Kinkaid Act, directed an investigation of the lower Colorado River. This indicated the serious purpose of the Federal Government to proceed with the development of the river. As works on the lower river would be certain to create permanent water rights, a movement was started by States in the upper drainage basin of the river, so that these would not be affected or impaired by any development which might be authorized. Ottamar Hamele, Chief Counsel of the Reclamation Service, expressed his opinion as follows:

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<sup>1</sup>Dr. Elwood Mead, "The Colorado River; Economic Development of Its Basin." Engineering News-Record, February 6, 1930.

It will be noted that the Upper States are much more concerned in seeing a compact than are the lower States. As a matter of fact the lower States have little to gain by such a compact, while the upper States have much to gain. Accordingly, it would seem that any substantial concessions to be made in the way of a compromise in order to arrive at such a compact should be made by the upper States than by the lower States.<sup>2</sup>

Commissioners were appointed by the seven States to negotiate an interstate treaty or compact. Herbert Hoover was named to represent the Federal Government. The Colorado River Compact was finally drawn up at Santa Fe, New Mexico, and later ratified by all the State legislatures, with the exception of Arizona.

The Arizona Colorado River Commission gives the following reasons why that state would not ratify the compact: First, Arizona objected to the inclusion of the Gila River, and, second, while the prior appropriation doctrine would thereby be destroyed between the two basins by the allocation of waters to each of them, yet it would remain in full force and effect as between California and Arizona, and that while the Upper Basin States had escaped the danger which they had feared by California appropriating a great amount of water through the All-American canal that it intended to build, yet the same danger would still confront Arizona.

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<sup>2</sup>Reuel Leslie Olson, The Colorado River Compact, 282.



These were the reasons why Arizona would not ratify the Seven States Compact. She knew that she could not compete in wealth or in influence with California, and that California could take the water allocated to the Lower Basin by prior right of appropriation and thereby destroy Arizona's chances of ever irrigating any considerable lands from the waters of the main Colorado River.<sup>3</sup>

The following statement was made by Herbert Hoover then Secretary of Commerce, before the Senate Committee on reclamation and irrigation.

I may say that the Colorado River problem does not lie in the lack of enormous resources in water, in arid land, and in power, or of private or public capital to develop it. The difficulties are the sharp conflicts of opinion of the people in the basin on a multitude of questions as to their rights, their interests, and the method of development of the river. And these conflicts have been in course of discussion, to my knowledge, for some 15 years. They have resulted in innumerable conferences, discussions, and appeals to legislation and to the courts.

The first of these conflicts, and the one that overrides all others, is the conflict over water rights between the seven States. The four States in the upper basin have, naturally, opposed any development in the lower basin until such time as they could have assurance of some fixed assurances of their water rights. As the committee is well aware, the application to beneficial use will give priority in water rights as between States, and, as the development of the Colorado River will take place in the lower basin long

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<sup>3</sup>Charles B. Ward, Colorado River Controversy, Phoenix, 1929, 8.

before any large development in the upper basin, therefore, the upper-basin States have justifiably been resolute in their demands for some fixation of the rights before there shall be construction and thus extension of beneficial use down below.

The next most important line of conflict is over the character and location of the first works to be erected on the river. I believe the largest group of those who have dealt with the problem, both engineers and business folk, have come to the conclusion that there should be a high dam erected somewhere in the vicinity of Black Canyon. The dam so erected is proposed to serve the triple purpose of flood control, storage, and power.<sup>4</sup>

Bitter controversy has been waged between Arizona and California as to the amount of water each of these states should be allowed to use. Arizona has insisted that California is developing more rapidly and consequently if allowed to go ahead unhampered will use an amount of water which Arizona claims would hamper Arizona in her development. As a matter of fact, California is convinced that Arizona is developing new agricultural land faster than California. The reason is that in Arizona development is being done by the United States Reclamation Service, while in California it is being financed by private capital. The Colorado River Commission of California has made the following statement in regard to this question:

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<sup>4</sup>Herbert Hoover, Senate Committee records on Reclamation and Irrigation, December 10, 1925, 599.

California has need of some 7,380,000 acre-feet of water from the Colorado River. It is doubtful if she will be able to get such an amount. In California there has been considerable apprehension over the possibility that this State might accept some of the proposals made by Arizona and thereby condemn acreage which is known to be capable of irrigation to remain forever dry.

The California Commission feels that Arizona's demands for water are exorbitant and not justified by surveys and engineering reports and what Arizona is really contending for is something beside water; probably principally revenue.

Due to the fear that California might be forced into a water agreement that would unreasonably limit the State in its development, some apprehension has been felt that if the agricultural interests were allowed the amount of water deemed necessary there would not be sufficient water for domestic purposes for the coastal plain cities, or that if coastal plain cities were given sufficient domestic water than the agricultural interests would be compelled to put up with the shortage.

....A meeting was called in Los Angeles of representatives of the agricultural groups and of the Metropolitan Water District of Los Angeles. After considerable discussion an understanding was reached agreeing to divide up any water that might be apportioned to California from the Colorado River.

This agreement was based upon the limitation that California has accepted under the Boulder Canyon Project Act, i. w., that California's use should be limited to 4,400,000 acre-feet of so-called Class A. or firm title water, plus one-half of the surplus water. Under the terms of this agreement the understanding was that the water was to be divided as follows:

Class A Water--

Agricultural groups ----- 3,850,000 acre-feet  
per annum.

Metropolitan Water District -- 550,000 acre-feet  
per annum.

4,400,000 acre-feet  
per annum.<sup>5</sup>

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<sup>5</sup>Colorado River Commission of California, Boulder Canyon Project, 44.

California has maintained that all financial phases of the project should be left in the hands of the Secretary unhampered and uncomplicated by a State compact. This was evidently the policy that Congress intended to adopt, as shown by the Boulder Canyon Project Act. The final proposal made by California at Phoenix, February 8, 1930, expressed briefly this conviction. The last paragraph of the California proposal was:

All other points to be left to the determination of the Secretary of the Interior, under the act.

The Arizona Commission agrees that Arizona owns three hundred and forty miles of the river in its entirety, and it also owns one-half interest in common with Nevada and California in three hundred and eighty miles more down to the International line.

Arizona owns more than 73% of the river south of the Utah line, and the area of land in the Arizona basin is nearly twenty times that of California, and in this basin she has more than three times as much arable desert land lying immediately adjacent to the lower river than has California.<sup>6</sup>

The California Commission are agreed that the above is partially true, but they would modify Arizona's claim thus:

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<sup>6</sup>John F. Stevens, The Matter of the Colorado River, 26.

On account of topographical conditions in the Lower Basin very different conditions exist in California and Arizona. Arizona's richest agricultural district lies to a large extent in and around the Gila River Basin; while California's major area, on which water could be put from the Colorado River, lies in the Imperial and Coachella Valleys, and in and around the Blythe District. Both of the California areas can only be watered from the main stream of the Colorado. The Yuma District, a comparatively small portion of which lies in California and the major portion of which lies in Arizona, is, of course, watered from the main stream of the Colorado.<sup>7</sup>

The Yuma Irrigation Project has a total of 110,000 irrigable acres, 65,000 of which are gravity lands, and 45,000 mesa lands, at an elevation of approximately 80 feet above the gravity lands. Of the gravity land 15,000 acres is in California and 50,000 acres in Arizona. All of the mesa land is in Arizona. This project lies just north of the Mexican boundary line. In 1929, only 1162 acres of the mesa land was irrigated, as the cost of water and the

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<sup>7</sup>Colorado River Commission of California, Boulder Canyon Project, 46.

development on this mesa land is so expensive there has been some difficulty in inducing settlers to locate.

Arizona has been contending that because the natural resources or advantages located in one State were used for the benefit of another State that the State receiving the benefits should pay a revenue or tax to the first State. Here is an example of an Arizona development, actually in operation, which shows that the policy now practiced in that State is contrary to one they wish to follow in connection with the Boulder Dam:

The Laguna Dam at Yuma, is a broad low structure of the weir type which extends from solid rock on one side of the Colorado River to solid rock on the other, a length of 4750 feet. The crest of the Dam is at an elevation of 151 feet above sea level. This dam raises the water surface of the river about 10 feet at the river's low stage. The Dam was put in to provide a sufficient height of water to make certain diversion in the Yuma Canal. Diversion is made on the California side of the river, the water is carried down through a canal on the California side about 8 miles to a point known as Siphon Drop, at which location there is a power house of about 2000 k. v. a. capacity through which the water is passed. A very small amount of water is diverted from the Arizona side of the Dam, but practically all of the water used on Arizona land is being carried through the main canal and power house on the California side of the river. California has never asked nor expected to receive such revenue in connection with the Yuma project, being glad to give all possible aid to the development in her sister State and believing that the policy thus laid down, if such may be termed a policy, is justified.

As more extensive investigations were made, more information was available and it is now probable that the All-American Canal will never connect with the Laguna Dam, the probability being that the intake to the canal will be four or five miles farther upstream, this being done to gain additional elevation; hence, the Imperial Irrigation District has contributed \$1,600,000 to the development of a project in Arizona (the land in California in the Yuma project being almost a negligible portion of the entire development--possibly 10%.)<sup>8</sup>

When Laguna Dam was constructed it was contemplated that some time in the future an All-American canal would be constructed which would feed Imperial Valley and that this All-American Canal would take its water from the Colorado River at Laguna Dam, consequently an agreement was entered into at the time the Dam was constructed by which the Imperial Irrigation District agreed to pay a large portion of the construction costs. Although not one drop of water has ever been diverted at Laguna Dam for use in Imperial Valley, there being no connection between Laguna Dam and the Valley.

If the method of handling the Yuma project may be taken as a precedent establishing a policy, it is interesting to note the following facts:

1. Water is diverted on the California side of the river for use in Arizona.

2. A power plant has been constructed in California, the revenues from which are used in Arizona

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<sup>8</sup>Colorado River Commission of California, Boulder Canyon Project. 25.

for the benefit of Arizona lands.

3. A California interest (Imperial Irrigation District) is paying for a large portion of the total cost of Laguna Dam thus benefiting still further Arizona lands by relieving these lands of a large portion of the cost of Laguna Dam.

4. California receives no revenue from the power plant.

There are various reasons why Arizona is very much opposed to the Boulder Canyon Act. Perhaps the best summary of facts is stated by Lewis Douglas of Arizona, in his "Minority Views":

I am opposed to this act because this bill authorizes the construction of a major power project, to be owned and operated by the Federal Government.

Because this measure, in effect, injects the Federal Government into the banking business for the purpose of loaning its credit to further the ambitions of municipalities of southern California toward the creation of a socialistic power organization.

Because the Federal Government will not be reimbursed for the expenditures authorized under this Act.

Because the project authorized by this measure will provide waters available for use in Mexico in such quantities as to forever impair proper ultimate development of the Southwest.

My argument in opposition to this bill is directed toward the particular structure authorized under this act, but is not directed against sound economic development of the Colorado River.<sup>9</sup>

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<sup>9</sup>Lewis Douglas, H. R. Minority Views. (To accompany H. R. 5773) 70th Cong., 1st Sess., 1928, 45.



The following summary of Arizona's reasons for opposing the Boulder Act are here given, which the Arizona Colorado River Commission have accepted.

The bill ignores every arbitration recommendation made, after months of labor by the Conference of Governors and advisers of the seven basin states, held at Denver in the fall of 1927, including their proposed compromise division of the river water.

(a) The bill denies the three requests of Arizona: (1) Protection against Mexico; (2) An equal division of Colorado River water with California and (3) that water power properties pay taxes like other property.

(b) The bill pretends to limit Mexican use of water; actually it does not, but limits use in the United States to 16,000,000 acre-feet until 1963-- which means forever. (Line 21, page 12 and Art. 3, Section a, b, f, Santa Fe Pact.)

The bill pretends to limit California to 4,600,000 acre-feet; actually it authorizes her to take approximately 7,600,000 acre-feet, or all the water allotted to the Basin in the Santa Fe Compact. (Line 15, p. 6; line 6, page 7. 4,600,000 plus 3,000,000 acre-feet of normal flow and evaporation.)

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A careful analysis of the Boulder Canyon Project Act by unbiased Government officials reveal the following provisions to be effective under this act:

1. That the location of the project shall be at Boulder or Black Canyon. (Sec. 1.)
2. That the purpose of the act is to control floods, improve navigation, and regulate the flow of the Colorado River, to provide for storage and use exclusively within the United States, and to generate electrical energy as a means of making the project a financially solvent undertaking. (Sec. 1.)
3. That any rights of States may have to water within their boundaries, or the right to adopt such policies and enact such laws as they deem necessary, with respect to the appropriation, control, and use of water within their boundaries, shall not be modified except by the Colorado River compact or other interstate agreement. (Sec. 18.)
4. That the Secretary of the Interior is authorized to carry out the provisions of this act, subject to the Colorado River compact. (Par. (b), sec. 8.)
5. That there is hereby appropriated the sum of \$165,000,000 to carry out the purpose of this act. (Sec. 3.)
6. That the Secretary of the Interior is authorized to acquire by proceedings, eminent domain, and otherwise all rights of way, lands, and other property necessary to carry out the purposes of this act. (Sec. 1.)
7. That no expenditures out of the fund shall be made for operation and maintenance except from appropriations therefor. (Par. (c), sec. 2.)
8. That interest shall be at the rate of 4 per cent on all amounts advanced from the fund under provisions of this act, and all amounts advanced from such funds shall be checked by the Secretary of the Interior at the close of each fiscal year. (Par. (b), sec. 2.)

9. That no person shall be entitled to have the use of water for any purposes, except by contract made with the Secretary of the Interior as herein stated. (Sec. 5.)

10. That after the \$25,000,000 set aside for flood control has been replaced from the  $62\frac{1}{2}$  per cent of any excess over the amounts due the Government, after the amortization period, it shall be placed in the fund to be expended within the Colorado River basin as may hereafter be prescribed by Congress. (Sec. 5.)

11. That the rights of the United States in or to the Colorado River and its tributaries shall be subject to and controlled by the Colorado River compact. (Par. (b), sec. 13.)

12. That  $37\frac{1}{2}$  per cent of any moneys collected by the Secretary of the Interior, above the amounts due the Government, shall go to Arizona and Nevada, presumably in lieu of taxes, by virtue of their natural resources being taken for a public service. (Par. (b), sec. 4.)

13. That the power to be sold at a price that may be found to be "Justified by competitive conditions at distributing points or competitive centers." (par. (b), sec. 4.) Contract shall be made with a view to securing "reasonable returns." (Par. (a), sec. 7.)

14. That the provisions of the Federal water power act and regulations of the Federal Power Commission shall be conformed with as far as practicable in the operation and administration of the project and for the protection of the investor and consumer. (Sec. 6.)

15. That there shall be readjustment periods for the sale price of the power, either upward or downward, as conditions at distributing points may indicate, the first readjustment after 15 years and every 10 years thereafter. (Par. (a), sec. 5.)

16. That no charge shall be made for water for irrigation and portable purposes in the Imperial or Coachella Valleys. (Sec. 1.)

17. That the water may be sold for irrigation and portable purposes in all districts except the Imperial and Coachella Valleys. (Sec. 5.)

18. That a board may be arranged for, consisting of one member from each of the seven States, to advise with the Secretary of the Interior on the sale price of water and power, and matters relative to the States. (Sec. 16.)

19. That the sum of \$25,000,000 be set aside for flood control, to be replaced out of  $62\frac{1}{2}$  per cent of any revenue in excess of the amount necessary to repay the Government, and if not entirely replaced during the amortization period, it may, thereafter, be paid from the  $62\frac{1}{2}$  per cent of the net profit. (Par. (b), sec. 2.)

20. That the all-American canal may be constructed, and any dam and necessary works, under the reclamation act, which provided that all expenditures be underwritten by the lands benefited, prior to the beginning of construction, and shall not be paid for out of the proceeds from the sale of water or power. (Sec. 1.)

21. That a dam be constructed with a reservoir capacity of not less than 20,000,000 acre-feet of water. (Sec. 1.)

22. That firm contracts be made by the Secretary of the Interior for the sale of power generated, and for the use of water to generate power, and for the storage of water for irrigation and domestic purposes, and that will replace the Government investment in dam and power plants in 50 years, before construction shall be undertaken, and the charges for water for irrigation and domestic purposes shall be for permanent service. (Sec. 5.)

23. That the consent of Congress is given to the seven States of Colorado, New Mexico, Wyoming, Utah, Arizona, California, and Nevada to enter into a compact, or agreement, supplemental to and in conformity with the Colorado River compact. (Par. (a), sec. 13.)

24. That the consent of Congress is given any 6 States of the basin, including California, to enter into a 6-State compact, if said 6 States ratify the Colorado River compact without conditions except to waive the provisions of the first paragraph of Article 3 of said compact, requiring 7 States, provided that California limits itself, by legislative action, to a consumptive use of not more than 4,400,000 acre-feet

of water from the Colorado River, and in the event of the 6-State pact, the act shall become operative after 6 months from date of passage. These conditions have been complied with both as to the 6-State compact and the California limitation as to the use of water. (Par. (a), sec. 4, par. (a), sec. 13.)

25. The consent of Congress is given to the three States of California, Arizona, and Nevada to enter into an agreement, and specially provides for seven conditions under which this agreement may be made, and not be necessary to return to the Congress for re-ratification, as follows: (Par. (a), sec. 4.)

(1) That of the 7,500,000 acre-feet annually apportioned to the Lower basin by paragraph (a) of article 3 of the Colorado River compact, there shall be apportioned to the State of Nevada 300,000 acre-feet, and to the State of Arizona 3,800,000 acre-feet for exclusive beneficial and consumptive use in perpetuity.

(2) That the State of Arizona may annually use one-half of the excess or surplus waters unapportioned by the Colorado River compact.

(3) That the State of Arizona shall have the exclusive beneficial consumptive use of the Gila River and its tributaries within the boundaries of said state.

(4) That the waters of the Gila River and its tributaries, except return flow after the same enters the Colorado River shall never be subject to any diminution whatever by any allowance of water which may be made by treaty or otherwise to the United States of Mexico, but if, as provided in paragraph (c) of article 3 of the Colorado River compact, it shall become necessary to supply water to the United States of Mexico from waters over and above the quantities which are surplus as defined by said compact, then the State of California shall and will mutually agree with the State of Arizona to supply, out of the main stream of the Colorado River, one-half of any deficiency which must be supplied to Mexico by the lower basin.

(5) That the State of California shall and will further mutually agree with the States of Arizona and

Nevada that none of said three States shall withhold water and none shall require the delivery of water which can not reasonably be applied to domestic and agricultural uses.

(6) That all of the provisions of said tri-State agreement shall be subject in all particulars to the provisions of the Colorado River compact.

(7) Said agreement to take effect upon the ratification of the Colorado River compact by Arizona, California and Nevada. (Par. (a), sec. 4.)

And further provides that the three States may enter into any compact, or any two thereof may enter into any compact, subject to further approval of Congress.

26. That general and uniform regulations shall be prescribed by the Secretary of the Interior for awarding contracts and for the renewal of contracts, and providing that no contracts shall be of longer duration than 50 years. (Sec. 5.)

27. That any dispute or disagreement as to the fulfillment of any contract made under this act, shall be determined either by arbitration or court proceeding. (Par. (a), sec. 5.)

28. That contracts for use of power shall be made with responsible applicants, who will pay the price set by the Secretary, with a view to meeting the revenue requirements provided for in this act. (Par. (c), sec. 5.)

29. That in case of conflicting applications for the purchase of power and water, that the Secretary of the Interior shall determine the matter in conformity with the policy expressed in the Colorado River pact as to conflicting contracts for water and power rights, preference being first given to a State. (Par. (c), sec. 5)

30. That the preference shall be given to a State for the purchase of power within six months after the Secretary of the Interior has given notice, provided, however that time shall be given for a State to arrange for bond issues for payment. (Par. (c), sec. 5.)

31. That any agency receiving a contract for electrical energy equivalent to 100,000 horsepower may be required by the Secretary of the Interior, if deemed feasible, to allow any other agency having contracts for less than 25,000 horsepower to participate in the benefits and to use any main transmission line constructed for carrying such energy, upon payment of a reasonable share of the cost of construction, operation, and maintenance. (Par. (d), sec. 5.)

32. That the Federal Power Commission is hereby directed not to issue or approve any permits under the Federal water power act upon the Colorado River or any of its tributaries, except the Gila River, in the Colorado River Basin, until this act shall become effective. (Sec. 5.)

33. That the United States in constructing, managing, and operating the project under this act, shall be subject to, and controlled by the terms of any compact between the States of Arizona, Colorado, and Nevada, or any two thereof. (Par. (b), sec. 8.)

34. That all persons who have served in the United States Army during the wars with Germany, Spain, or the insurrection in the Philippines shall have preference, for three months, to the right of entry into any public lands thrown open by the Secretary of the Interior. (Sec. 9.)

35. That, as far as practicable, preference shall be given to persons serving in the war with Germany, Spain, or the insurrection in the Philippines, in all construction work authorized by this act. (Sec. 9.)

36. That the Secretary of the Interior is authorized to investigate the feasibility and determine the boundaries of the reclamation project known as the "Parker-Gila Valley reclamation project" in Arizona, and determine the most feasible method of irrigation of these lands. (Sec. 11.)

37. That the Secretary of the Interior is authorized and directed to make investigation and public reports of the feasible projects for irrigation, and sites for power projects in the States of New Mexico, Colorado, Wyoming, Utah, Arizona, and Nevada. (Sec. 15.)



38. The Secretary of the Interior may, at his discretion, lease the use of the water for generating power, deliver power at the switchboard, or build and lease the power plants. (Sec. 6.)<sup>10</sup>

The following recommendations were submitted to the Senate Committee on Reclamation and Irrigation, January 20, 1928, by the Nevada-Colorado River Commission:

1. That Nevada and Arizona should benefit from the proposed development, at least, to the extent that they would benefit if developed by private capital, second only to Government payments and any reasonable reserve.
2. That the power be not sold as low as the repayments to the Government will permit, but should be sold at a competitive figure comparable with the cost of power available elsewhere for these markets.
3. That arrangements be made for the sale of the power, so that fair offers may be had, and that legitimate bidders be not handicapped.
4. That suitable readjustment periods be arranged for power charges per kilowatt-hour and also for the proper charges for other service rendered.
5. That proper charges be made for other service rendered, flood control, silt control, irrigation water storage, and domestic water storage.
6. That the States shall have the right to withdraw, upon proper notice, certain blocks of power, to be used within their own States.

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<sup>10</sup>Colorado River Investigations by United States Senate, "Colorado River Development," 70th Cong., 2d Sess., Document No. 186, 14-18.

7. That a board be arranged for, from the three lower States to assist the Secretary of the Interior, or any agency supervising the sale of the power and other service rendered, in an advisory capacity to fix the proper charge per kilowatt-hour and proper charges for other service rendered.

8. That an attempt be made to equalize, in some manner, between the three States the benefits from reclamation financing.

9. That after Government advancement is entirely repaid, the benefits from this development accrue to the States.<sup>11</sup>

It will be seen that the first eight of the nine recommendations are included in the bill as passed, none of which were included in the original bill. If the power generated by this construction is disposed of on a competitive basis in the market, by the Secretary of the Interior, 37½% of the net returns over the payments due the Government should provide payments to Nevada and Arizona, at least equal to the amount they would receive from the project through taxes, if developed by private capital.

The Colorado River is a natural resource of great potential value by reason of a combination of abundant water supply with characteristics of drainage basin and stream bed which presents striking possibilities for the development of agricultural lands through irrigation,

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<sup>11</sup>Nevada-Colorado River Commission's report, "Colorado River Power and Water Set-up", January 1, 1928.

the generation of power and the furnishing of water for important municipal, industrial, and other uses. The need is now apparent for a major step forward in the development of this river and in its transformation from an instrumentality conveying grave menace of destruction of life and property to one of much greater usefulness than now effected. The benefits of the proposed Colorado River development can be classified as follows:

1. Agricultural Benefits.--The menace of floods and silt will be removed from agricultural lands having a present value in excess of \$100,000,000. This property will be greatly enhanced in value and interest rates on farm loans in the district will be correspondingly reduced.

(a) There will be a material increase in crop productivity due to assured water supply.

(b) A very large acreage of now valueless land can be made available for irrigation and cultivation as soon as warranted by economic conditions.

(c) There will be a reduction of the cost of levee maintenance and silt removal. These items in the past have exceeded \$1,000,000 per year in amount.

2. Municipal benefits.--The insurance of an adequate domestic water supply for municipal needs is a benefit which many properly be charged to the communities which benefit therefrom. The pumping of such water supply will absorb a large proportion of the power generated. There is also a municipal benefit accruing from the creation of new industry and new taxable property.

3. Industrial benefits.--The southwestern part of the United States is favorably situated with respect to raw material supplies, climatic conditions, labor, and

transportation. With the addition of an ample cheap power supply it appears that industrial development will be thereby stimulated. The proposed Boulder Canyon development is estimated to furnish 3,600,000,000 kilowatt-hours of electrical energy per year at a very low price delivered to centers of population and major use. The industrial development of the territory to be served can reasonably be expected to absorb the electrical power to be developed by the project in less than 10 years.<sup>12</sup>

Development of both the upper and lower basins of the Colorado River system has been proceeding for many years. Further progress in the development of the upper basin will gradually continue indefinitely into the future and will be ruled as to time and value by economic conditions. There is no special urge at this time for development in the upper basin states on a large scale.

A different situation applies to the Lower Basin. At the present time the river in its largely uncontrolled state is a serious menace. The greatest natural resource of the southwest is this great river.

Development on the Colorado River according to the Boulder Canyon Project Act will mean the following benefits for the Upper and Lower Basin States:

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<sup>12</sup>J. G. Scrugham, "Report on the Problems of the Colorado River Control." Hearings before the Committee on Irrigation and Reclamation, 70th Cong., 1st Sess., S. 728 and S. 1274. Washington, 1928. 428.

### Upper Basin Benefits.

1. Water supply sufficient for all irrigable lands is reserved in perpetuity.
2. Surveys and investigations are to proceed immediately when the act is effective to determine feasible projects and money appropriated therefor.
3. After the Government is repaid as provided in the act, and after the \$25,000,000 is repaid from the 62½% of the net profit, the money to remain in a special fund to be expended in the Colorado River Basin States, as Congress may direct, disposition of project after the Government is repaid is left for further Congressional action.

### Arizona Benefits.

1. Flood control in Yuma Irrigation Project.
2. Silt control in Yuma Irrigation Project.
3. Two million eight hundred thousand acre-feet of water in perpetuity, in case of tri-State agreement, conforming to section 4 of the act.
4. Exclusive beneficial use of Gila River, in case of Tri-State agreement, conforming to section 4 of the act.
5. Surveys and investigations to determine feasibility of Parker-Gila Valley project.
6. Eighteen three-fourths per cent (18-3/4%) of all money received in excess of the payments due the Government.
7. "Preference of purchase" power for use in the State.
8. Reservoir to store water for irrigation.

### California Benefits.

1. Flood control in Imperial Valley.
2. Silt control in Imperial Valley.
3. Water for irrigation and potable purposes in Imperial and Coachella Valleys, without charge.

4. All-American canal, by repaying the Government its total cost.
5. Water for southern California cities by paying for it as provided.
6. Power for use in the State by paying for it as already set up.
7. Reservoir to store water for above purposes.
8. Preference to purchase power for use in the State.

Nevada Benefits.

1. Three hundred thousand acre-feet of water for irrigation and potable purposes if agreement is entered into in accordance with section 4 of the act.
2. "Preference of purchase" power for use in the State.
3. Surveys and investigations to determine feasible projects.
4. 18-3/4 per cent of all money received in excess of the payment due the Government.
5. Reservoir to store water for irrigation.<sup>13</sup>

The Boulder Canyon Project Act which was passed by Congress in December, 1928, provides for the building of what is known as the Boulder Dam. This project will change the Colorado River from a menace to a creative force. The dam will be one of the stupendous engineering works of the world. The reservoir created will be by far the largest artificial body of water in existence; outside of the Great Lakes the largest body of water in the Nation.

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<sup>13</sup>United States, "Colorado River Development,"  
Senate Document 186, 20-21.

Senator Johnson of California, who made a strong appeal in behalf of the Boulder Canyon Project Act before the United States Senate declared that the people of the Southwest are not asking of the Government for this great public improvement as a gift. All they ask is that the Government lend its good offices to make this development possible. It is a great constructive improvement, not experimental, sound financially, well considered, shaped in the public interest, one the consummation of which will be a source alike of national pride and advantage.<sup>14</sup>

For the People of the Southwest, Boulder Dam means the protection of their homes and families, the crops that are their livelihood; to them it means relief in the dreaded periods of drought, protection in flood time. It means the development of the entire Southwest; the building of a vast region; the reclamation of desert acres; the springing up of cities; the hum of commerce and trade. The significance of the future development of this last American frontier, the great Southwest, will be determined to a very great extent upon the control and regulation of the Colorado River.

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<sup>14</sup>Hiram W. Johnson, The Boulder Canyon Reclamation Project, 28.

The controversy between Arizona and California is a very complicated situation. Political, economic, jealousy of state rights, whether real or imaginary, exist on both sides. Water, its control, and use, has been the dominant element; and power, with the attendant income feature, has been the cause of so much contention between the two states.

When the Colorado River Compact was drawn up there was very little general understanding of the actual conditions existing upon the Colorado River, the irrigable areas in the various States were more or less problematical, surveys had not yet been made and the information regarding the real conditions was uncertain. The general impression was that there was more water than could be used. As more information was made available, considerable apprehension was felt that the water supply would be inadequate to irrigate certain areas susceptible of irrigation in the two States. This feeling of apprehension was probably exaggerated in some cases while in other cases investigation seems to indicate that it was justified.

Mr. E. C. LaRue, an authority on the Colorado River question, expressed his opinion concerning this matter as early as 1916. After many surveys of the river and investigations conducted by the Government



he is convinced that the flow of the Colorado River and its tributaries is not sufficient to irrigate all the irrigable lands lying within the basin. Additional data collected by Mr. LaRue and others in recent years seem to indicate that this conclusion is correct.

The economic interests of these two states are somewhat different. Arizona considers the Colorado River as its greatest natural resource. This state cannot accept the Colorado River Compact and Boulder Canyon Project Act as they now stand; but nevertheless, it is absolutely necessary that some provisions be made to safeguard the States future interests in this great river. At the present time there is no urgent need in Arizona for the development of the Colorado River but in California the need is urgent.

The Colorado River Compact as originally drawn required ratification of all seven Colorado River Basin States and Congress before becoming effective, but after repeated refusal of Arizona to ratify, it was finally accepted as binding by six of the States and the Congress. This left Arizona as the one dissenting State, outside of and not bound by the compact.

In California there seems to be the belief that Arizona is demanding an unreasonable amount of water. The California Commission points out the fact that

Arizona is developing much more rapidly than California; the reason being that in Arizona development is being done by the United States Reclamation Service, while in California it is being financed by private capital. Arizona has insisted that California is developing more rapidly and consequently if allowed to go ahead unhampered will use an amount of water which Arizona claims would hamper her future development.

A large portion of the irrigation development in Arizona is on the Gila River, one of the tributaries of the Colorado River. Arizona contends that use of the Gila water shall not be considered as her share of the water of the main stream of the river.

The Colorado River Compact will affect each of these States in the following manner. Due to the fact that Arizona has not accepted and is consequently not bound by the Colorado River Compact, she stands in exactly the same position regarding water rights in the Colorado River system as she did before the compact was drawn up. California on the other hand, having by her ratification of the Colorado River Compact agreed to the limitation on use of water in the Lower Basin, has seemingly cut off any grounds for action against the Upper Basin States for redress, if

the use of water in the Upper Basin States plus the Arizona use should imperil California diversions, provided the Upper Basin States use is within that allowed by the compact. As most of the California diversions on the Colorado River will be physically below the point where Arizona might make major diversions, California, taking water from points on the lower river will, of course, be the one to suffer in case of shortage.<sup>15</sup>

Arizona has seemingly asked for two things, water and revenue. Power has been included as one of the elements insisted upon by Arizona to be settled by compact, but power has been considered as merely a means of revenue, possible through resale. The Secretary of the Interior in making contracts for power has reserved for Arizona 18 per cent of the total, to be taken, if, and when desired. Arizona is not obligated to take this power, but it is there if she wants it, thus the State is given an opportunity for industrial development due to cheap power. Up to this time it apparently has been impossible for these two states to compromise in regard to either water rights or power. Much misunderstanding

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<sup>15</sup>Colorado River Commission of California, The Colorado River and the Boulder Canyon Project, 330.

exists between Arizona and California due to these above reasons.

It has been difficult for the California representatives to determine exactly what the State of Arizona is seeking. Any proposal that Arizona has made on water has been coupled with the proviso that the acceptance of such conditions were predicated upon a satisfactory arrangement regarding power being reached and any proposal in connection with power carried the same proviso regarding a satisfactory agreement being reached upon water. It has been rather difficult to accurately define Arizona's contentions but on one point, however, there appears to be no doubt. Chairman Ward of the Arizona Commission at the last conference in Phoenix made the statement that "Arizona will not sign any compact which has to do with water alone."<sup>16</sup>

As matters now exist the power contracts call for payment of a higher price than the power could be duplicated for on the Pacific Coast. California has accepted a limitation upon water use imposed by the Colorado River Compact and the Boulder Canyon Project Act. This limitation upon California's use of water

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<sup>16</sup>Colorado River Commission of California, The Colorado River and the Boulder Canyon Project, 332.

will not permit of full development of all known projects. California is agreed that it would be disastrous to consent to any further reduction of water allocation or power.

Secretary Wilbur in a letter to Governor Phillips of Arizona, on May 9, 1930, made the following statement:

. . . . and amount ranging between \$29,000,000 and \$66,000,000 depending on the same factors, will have been paid into the Colorado River Dam for other developments on the river, in which your State will have a share. In other words, your State, without guaranteeing a penny toward the success of this project, is handed a sum ranging from \$350,000 to upwards of \$500,000 per year and given a free option of over 100,000 horsepower. The share of the firm power given Arizona and Nevada together is 36 per cent. Compare your position, as stated above, with that of the Metropolitan Water District, which pays for an exactly equivalent amount (36 per cent) about \$118,000,000 over the period of its contract, under a firm obligation which must be fulfilled whether the power is needed or not. These privileges in favor of your State mean a corresponding assumption of burdens by the California purchasers of power; and it would have been impossible to finance this project as a power project, pure and simple, under such burdens . . . . Recollection of these facts may help your people to recall that this is a water project and not a power project. Power is being sold to build the dam; the dam is not being built to sell power.<sup>17</sup>

Ever since the formulation of the Colorado River Compact and Arizona's refusal to accept such compact without additional understanding between the states,

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<sup>17</sup>Secretary Wilbur, Letter to Governor Phillips of Arizona, May 9, 1930.

efforts have been made to draw up such an agreement to apportion benefits expected from the development of the Lower Colorado River among the Lower Basin States. These negotiations have now narrowed down to negotiations between Arizona and California.

It should be said in justice to Arizona that they made the first overtures for such an agreement. At the time these overtures were made California as a state appeared to be little interested and almost totally ignorant of Colorado River development. Later, steps were taken by both states to bring about an understanding and efforts have been made to settle the differences through interstate negotiations in such a way that Colorado River development could proceed logically and harmoniously.<sup>18</sup>

Negotiations between the states were at first carried on through committees appointed by the legislatures or the governors of the states and later by commissions authorized by the legislature and appointed by the governors. These commissions have been known as Colorado River Commissions.

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<sup>18</sup>Colorado River Commission of California, The Colorado River and the Boulder Canyon Project, 326.

Thus we have this existing condition.. California has need of all water allocated to her and California interests are paying the highest price for power that conditions justify. The following conclusions reached by the Colorado River Commission of California in regard to the present relations of Arizona and California:

It will be disastrous to California to attempt to reduce the amount of water she can use under present allocation, and no further revenue could be obtained from power, because the power price is as high as is justified.

Under the terms of the power contracts Arizona has reserved for her a large block of power which she may take if, and when, wanted. She is not obligated to take this power, but it is there if she wants it, thus that State is given an opportunity for industrial development due to cheap power.

Arizona today is questioning by a suit in the Supreme Court of the United States the validity of both the Colorado River Compact and the Boulder Canyon Project Act.

California feels that perhaps this is the wisest course to pursue as many of the disputed points that have been a matter of controversy for a number of years will thus be cleared up by the highest authority in the land.<sup>19</sup>

Arizona for many years threatened to start litigation unless her demands in connection with the Colorado River development were complied with. In October, 1930, Arizona filed a bill of complaint in the United States Supreme Court asking that the Colorado River Compact and the Boulder Canyon Act be decreed to

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<sup>19</sup>Colorado River Commission of California, The Colorado River and the Boulder Canyon Project, 336.

be unconstitutional, void and of no effect; that the defendants be permanently enjoined from enforcing or carrying out said Compact, or said Act, or any of the provisions thereof, and from carrying out the three pretended contracts mentioned, or any of them, or any of their provisions, and from doing any other act or thing pursuant to or under color of said Boulder Canyon Project Act. That the State of Arizona recover its costs, and have such other and further relief as to the court may seem just and equitable.

Arizona contended that the Boulder Dam Act is unconstitutional because (1) it attempts to deprive Arizona of its sovereign jurisdiction and control of the water, dam and reservoir sites situated in that State and vests control thereof in the United States without the necessity of its complying with the laws of Arizona; (2) it subjects Arizona to the Compact and makes it effective in that State without its approval thereof; (3) it authorizes the Secretary to build the Boulder Dam and store in it the 8,000,000 acre-feet per annum of unappropriated water, withhold the same from use in Arizona except by contract and authorizes him to sell it for use in other states even outside the drainage basin, thereby depriving Arizona and its citizens "of their right to appropriate said



8,000,000 acre-feet of unappropriated water"; (4) that said act aids and facilitates the use of the stored water in California and does not extend equal privileges and facilities to water users in Arizona; (5) authorizes the Secretary of the Interior to engage in the business of storing and selling water and generating electric power by the utilization of the natural resources of Arizona without providing appropriate compensation such as taxes to that State.

It is to be hoped that the dispute can be disposed of on motion to dismiss, if not, the trial will probably consume ten or fifteen years. The Government, the Upper Basin States, and the State of California will desire to file separate answers on separate theories of the case, while the City of Los Angeles, the Metropolitan Water District, the Southern California Edison Company will seek to defend their contracts.

There is no interruption in the work on the project at Boulder Canyon, as Arizona asked for no preliminary injunction. All of the Southwestern part of the United States are vitally concerned with the future development of the Colorado River.

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## APPENDIX A

## BOULDER CANYON PROJECT ACT.

Public--No. 642--70th Congress

H. R. 5773

An Act To provide for the construction of works for the protection and development of the Colorado River Basin, for the approval of the Colorado River compact, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That for the purpose of controlling the floods, improving navigation and regulating the flow of the Colorado River, providing for storage and for the delivery of the stored waters thereof for reclamation of public lands and other beneficial uses exclusively within the United States, and for the generation of electrical energy as a means of making the project herein authorized a self-supporting and financially solvent undertaking, the Secretary of the Interior, subject to the terms of the Colorado River compact hereinafter mentioned, is hereby authorized to construct, operate, and maintain a dam and incidental works in the main stream of the Colorado River at Black Canyon or Boulder Canyon adequate to create a storage reservoir of a capacity of not less than twenty million acre-feet of water and a main canal and appurtenant structures located entirely within the United States connecting the Laguna Dam, or other suitable diversion dam, which the Secretary of the Interior is hereby authorized to construct if deemed necessary or advisable by him upon engineering or economic considerations, with the Imperial and Coachella Valleys in California, the expenditures, for said main canal and appurtenant structures to be reimbursable, as provided in the reclamation law, and shall not be paid out of revenues derived from the sale or disposal of water power or electric energy at the dam authorized to be constructed at said Black Canyon or Boulder Canyon, or for water for potable purposes outside of the Imperial and Coachella Valleys: Provided, however, That no charge shall be made for water or for the use, storage, or delivery of water for irrigation or water for potable purposes in the Imperial or Coachella Valleys; also to construct and equip, operate, and maintain at or near said dam, or cause to be constructed, a complete plant and incidental structures suitable for the fullest economic development of electrical energy from the water discharged from said reservoir; and to acquire by proceedings in

eminent domain, or otherwise, all lands, rights of way, and other property necessary for said purposes.

Sec. 2. (a) There is hereby established a special fund, to be known as the "Colorado River Dam fund" (hereinafter referred to as the "fund"), and to be available, as hereafter provided, only for carrying out the provisions of this Act. All revenues received in carrying out the provisions of this Act shall be paid into and expenditures shall be made out of the fund, under the direction of the Secretary of the Interior.

(b) The Secretary of the Treasury is authorized to advance to the fund, from time to time and within the appropriations therefor, such amounts as the Secretary of the Interior deems necessary for carrying out the provisions of this Act, except that the aggregate amount of such advances shall not exceed the sum of \$165,000,000. Of this amount the sum of \$25,000,000 shall be allocated to flood control and shall be repaid to the United States out of 62½ per centum of revenues, if any, in excess of the amount necessary to meet periodical payments during the period of amortization, as provided in section 4 of this Act. If said sum of \$25,000,000 is not repaid in full during the period of amortization, then 62½ per centum of all net revenues shall be applied to payment of the remainder. Interest at the rate of 4 per centum per annum accruing during the year upon the amounts so advanced and remaining unpaid shall be paid annually out of the fund, except as herein otherwise provided.

(c) Moneys in the fund advanced under subdivision (b) shall be available only for expenditures for construction and the payment of interest, during construction, upon the amounts so advanced. No expenditures out of the fund shall be made for operation and maintenance except from appropriations therefor.

(d) The Secretary of the Treasury shall charge the fund as of June 30 in each year with such amount as may be necessary for the payment of interest on advances made under subdivision (b) at the rate of 4 per centum per annum accrued during the year upon the amounts so advanced and remaining unpaid, except that if the fund is insufficient to meet the payment of interest the Secretary of the Treasury may, in his discretion, defer any part of such payment, and the amount so deferred shall bear interest at the rate of 4 per centum per annum until paid.

(e) The Secretary of the Interior shall certify to the Secretary of the Treasury, at the close of each fiscal year, the amount of money in the fund in excess of the amount necessary for construction, operation, and maintenance, and payment of interest. Upon receipt of each such certificate the Secretary of the Treasury is authorized and directed to charge the fund with the amount so certified as repayment of the advances made under subdivision (b), which amount shall be covered into the Treasury to the credit of miscellaneous receipts.

Sec. 3. There is hereby authorized to be appropriated from time to time, out of any money in the Treasury not otherwise appropriated, such sums of money as may be necessary to carry out the purposes of this Act, not exceeding in the aggregate \$165,000,000.

Sec. 4. (a) This Act shall not take effect and no authority shall be exercised hereunder and no work shall be begun and no moneys expended on or in connection with the works or structures provided for in this Act, and no water rights shall be claimed or initiated hereunder, and no steps shall be taken by the United States or by others to initiate or perfect any claims to the use of water pertinent to such works or structures unless and until (1) the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming shall have ratified the Colorado River compact, mentioned in section 13 hereof, and the President by public proclamation shall have so declared, or (2) if said States fail to ratify the said compact within six months from the date of the passage of this Act then, until six of said States, including the State of California, shall ratify said compact and shall consent to waive the provisions of the first paragraph of Article XI of said compact, which makes the same binding and obligatory only when approved by each of the seven States signatory thereto, and shall have approved said compact without conditions, save that of such six-State approval, and the President by public proclamation shall have so declared, and, further, until the State of California, by act of its legislature, shall agree irrevocably and unconditionally with the United States and for the benefit of the States of Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming, as an express covenant and in consideration of the passage of this Act, that the aggregate annual consumptive use (diversions less returns to the river) of water of and from the Colorado River for use in the State of California, including all uses under contracts made under the provisions of this Act and all water necessary for the supply of any rights which may now exist, shall not exceed

four million four hundred thousand acre-feet of the waters apportioned to the lower basin States by paragraph (a) of Article III of the Colorado River compact, plus not more than one-half of any excess or surplus waters unapportioned by said compact, such uses always to be subject to the terms of said compact.

The States of Arizona, California, and Nevada are authorized to enter into an agreement which shall provide (1) that of the 7,500,000 acre-feet annually apportioned to the lower basin by paragraph (a) of Article III of the Colorado River compact, there shall be apportioned to the State of Nevada 300,000 acre-feet and to the State of Arizona 3,800,000 acre-feet for exclusive beneficial consumptive use in perpetuity, and (2) that the State of Arizona may annually use one-half of the excess or surplus waters unapportioned by the Colorado River compact, and (3) that the State of Arizona shall have the exclusive beneficial consumptive use of the Gila River and its tributaries within the boundaries of said State, and (4) that the waters of the Gila River and its tributaries, except return flow after the same enters the Colorado River, shall never be subject to any diminution whatever by any allowance of water which may be made by treaty or otherwise to the United States of Mexico but if, as provided in paragraph (c) of Article III of the Colorado River compact, it shall become necessary to supply water to the United States of Mexico from waters over and above the quantities which are surplus as defined by said compact, then the State of California shall and will mutually agree with the State of Arizona to supply, out of the main stream of the Colorado River, one-half of any deficiency which must be supplied to Mexico by the lower basin, and (5) that the State of California shall and will further mutually agree with the States of Arizona and Nevada that none of said three States shall withhold water and none shall require the delivery of water, which can not reasonably be applied to domestic and agricultural uses, and (6) that all of the provisions of the said tri-State agreement shall be subject in all particulars to the provisions of the Colorado River compact, and (7) said agreement to take effect upon the ratification of the Colorado River compact by Arizona, California, and Nevada.

(b) Before any money is appropriated for the construction of said dam or power plant, or any construction work done or contracted for, the Secretary of the Interior shall make provision for revenues by contract, in

accordance with the provisions of this Act, adequate in his judgment to insure payment of all expenses of operation and maintenance of said works incurred by the United States and the repayment, within fifty years from the date of the completion of said works, of all amounts advanced to the fund under subdivision (b) of section 2 for such works, together with interest thereon made reimbursable under this Act.

Before any money is appropriated for the construction of said main canal and appurtenant structures to connect the Laguna Dam with the Imperial and Coachella Valleys in California, or any construction work is done upon said canal or contracted for, the Secretary of the Interior shall make provision for revenues, by contract or otherwise, adequate in his judgment to insure payment of all expenses of construction, operation, and maintenance of said main canal and appurtenant structures in the manner provided in the reclamation law.

If during the period of amortization the Secretary of the Interior shall receive revenues in excess of the amount necessary to meet the periodical payments to the United States as provided in the contract, or contracts, executed under this Act, then, immediately after the settlement of such periodical payments, he shall pay to the State of Arizona  $18\frac{3}{4}$  per centum of such excess revenues and to the State of Nevada  $18\frac{3}{4}$  per centum of such excess revenues.

Sec. 5. That the Secretary of the Interior is hereby authorized, under such general regulations as he may prescribe, to contract for the storage of water in said reservoir and for the delivery thereof at such points on the river and on said canal as may be agreed upon, for irrigation and domestic uses, and generation of electrical energy and delivery at the switchboard to States, municipal corporations, political subdivisions, and private corporations of electrical energy generated at said dam, upon charges that will provide revenue which, in addition to other revenue accruing under the reclamation law and under this Act, will in his judgment cover all expenses of operation and maintenance incurred by the United States on account of works constructed under this Act and the payments to the United States under subdivision (b) of section 4. Contracts respecting water for irrigation and domestic use shall be for permanent service and shall conform to paragraph (a) of section 4 of this Act. No person shall have or be entitled to have the use for any purpose of the water stored as aforesaid except by contract made as herein stated.

After the repayments to the United States of all money advanced with interest, charges shall be on such basis and the revenues derived therefrom shall be kept in a separate fund to be expended within the Colorado River Basin as may hereafter be prescribed by the Congress.

General and uniform regulations shall be prescribed by the said Secretary for the awarding of contracts for the sale and delivery of electrical energy, and for renewals under subdivision (b) of this section, and in making such contracts the following shall govern:

(a) No contract for electrical energy or for generation of electrical energy shall be of longer duration than fifty years from the date at which such energy is ready for delivery.

Contracts made pursuant to subdivision (a) of this section shall be made with a view to obtaining reasonable returns and shall contain provisions whereby at the end of fifteen years from the date of their execution and every ten years thereafter, there shall be readjustment of the contract, upon the demand of either party thereto, either upward or downward as to price, as the Secretary of the Interior may find to be justified by competitive conditions at distributing points or competitive centers, and with provisions under which disputes or disagreements as to interpretation or performance of such contract shall be determined either by arbitration or court proceedings, the Secretary of the Interior being authorized to act for the United States in such readjustments or proceedings.

(b) The holder of any contract for electrical energy not in default thereunder shall be entitled to a renewal thereof upon such terms and conditions as may be authorized or required under the then existing laws and regulations, unless the property of such holder dependent for its usefulness on a continuation of the contract be purchased or acquired and such holder be compensated for damages to its property, used and useful in the transmission and distribution of such electrical energy and not taken, resulting from the termination of the supply.

(c) Contracts for the use of water and necessary privileges for the generation and distribution of hydroelectric energy or for the sale and delivery of electrical energy shall be made with responsible applicants therefor who will pay the price fixed by the said Secretary with a view to meeting the revenue requirements herein provided for. In case of conflicting applications, if any, such

conflicts shall be resolved by the said Secretary, after hearing, with due regard to the public interest, and in conformity with the policy expressed in the Federal Water Power Act as to conflicting applications for permits and licenses, except that preference to applicants for the use of water and appurtenant works and privileges necessary for the generation and distribution of hydroelectric energy, or for delivery at the switchboard of a hydroelectric plant, shall be given, first, to a State for the generation or purchase of electric energy for use in the State, and the States of Arizona, California, and Nevada shall be given equal opportunity as such applicants.

The rights covered by such preference shall be contracted for by such State within six months after notice by the Secretary of the Interior and to be paid for on the same terms and conditions as may be provided in other similar contracts made by said Secretary: Provided, however, That no application of a State or a political subdivision for an allocation of water for power purposes or of electrical energy shall be denied or another application in conflict therewith be granted on the ground that the bond issue of such State or political subdivision, necessary to enable the applicant to utilize such water and appurtenant works and privileges necessary for the generation and distribution of hydroelectric energy or the electrical energy applied for, has not been authorized or marketed, until after a reasonable time, to be determined by the said Secretary, has been given to such applicant to have such bond issue authorized and marketed.

(d) Any agency receiving a contract for electrical energy equivalent to one hundred thousand firm horsepower, or more, may, when deemed feasible by the said Secretary, from engineering and economic considerations and under general regulations prescribed by him, be required to permit any other agency having contracts hereunder for less than the equivalent of twenty-five thousand firm horsepower, upon application to the Secretary of the Interior made within sixty days from the execution of the contract of the agency the use of whose transmission line is applied for, to participate in the benefits and use of any main transmission line constructed or to be constructed by the former for carrying such energy (not exceeding, however, one-fourth the capacity of such line), upon payment by such other agencies of a reasonable share of the cost of construction, operation, and maintenance thereof.

The use is hereby authorized of such public and reserved lands of the United States as may be necessary or convenient for the construction, operation, and maintenance of main transmission lines to transmit said electrical energy.

Sec. 6. That the dam and reservoir provided for by section 1 hereof shall be used: First, for river regulation, improvement of navigation, and flood control; second, for irrigation and domestic uses and satisfaction of present perfected rights in pursuance of Article VIII of said Colorado River compact; and third, for power. The title to said dam, reservoir, plant, and incidental works shall forever remain in the United States, and the United States shall until otherwise provided by Congress, control, manage, and operate the same, except as herein otherwise provided: Provided, however, That the Secretary of the Interior may, in his discretion, enter into contracts of lease of a unit or units of any Government-built plant, with right to generate electrical energy, or, alternatively, to enter into contracts of lease for the use of water for the generation of electrical energy as herein provided, in either of which events the provisions of section 5 of this Act relating to revenue, term, renewals, determination of conflicting applications, and joint use of transmission lines under contracts for the sale of electrical energy, shall apply.

The Secretary of the Interior shall prescribe and enforce rules and regulations conforming with the requirements of the Federal Water Power Act, so far as applicable, respecting maintenance of works in condition of repair adequate for their efficient operation, maintenance of a system of accounting, control of rates and service in the absence of State regulation or interstate agreement, valuation for rate-making purposes, transfers of contracts, contracts extending beyond the lease period, expropriation of excessive profits, recapture and/or emergency use by the United States of property of lessees, and penalties for enforcing regulations made under this Act or penalizing failure to comply with such regulations or with the provisions of this Act. He shall also conform with other provisions of the Federal Water Power Act and of the rules and regulations of the Federal Power Commission, which have been devised or which may be hereafter devised, for the protection of the investor and consumer.

The Federal Power Commission is hereby directed not to issue or approve any permits or licenses under said Federal Water Power Act upon or affecting the Colorado River or any of its tributaries, except the Gila River, in the States of Colorado, Wyoming, Utah, New Mexico, Nevada, Arizona, and California until this Act shall become effective as provided in section 4 herein.



Sec. 7. That the Secretary of the Interior may, in his discretion, when repayments to the United States of all money advanced, with interest, reimbursable hereunder, shall have been made, transfer the title to said canal and appurtenant structures, except the Laguna Dam and the main canal and appurtenant structures down to and including the Syphon Drop, to the districts or other agencies of the United States having a beneficial interest therein in proportion to their respective capital investments under such form of organization as may be acceptable to him. The said districts or other agencies shall have the privilege at any time of utilizing by contract or otherwise such power possibilities as may exist upon said canal, in proportion to their respective contributions or obligations toward the capital cost of said canal and appurtenant structures from and including the diversion works to the point where each respective power plant may be located. The net proceeds from any power development on said canal shall be paid into the fund and credited to said districts or other agencies on their said contracts, in proportion to their rights to develop power, until the districts or other agencies using said canal shall have paid thereby and under any contract or otherwise an amount of money equivalent to the operation and maintenance expense and cost of construction thereof.

Sec. 8. (a) The United States, its permittees, licensees, and contractees, and all users and appropriators of water stored, diverted, carried, and/or distributed by the reservoir, canals, and other works herein authorized, shall observe and be subject to and controlled by said Colorado River compact in the construction, management, and operation of said reservoir, canals, and other works and the storage, diversion, delivery, and use of water for the generation of power, irrigation, and other purposes, anything in this Act to the contrary notwithstanding, and all permits, licenses, and contracts shall so provide.

(b) Also the United States, in constructing, managing, and operating the dam, reservoir, canals, and other works herein authorized, including the appropriation, delivery, and use of water for the generation of power, irrigation, or other uses, and all users of water thus delivered and all users and appropriators of waters stored by said reservoir and/or carried by said canal, including all permittees and licensees of the United States or any of its agencies, shall observe and be subject to and controlled, anything to the contrary herein notwithstanding, by the terms of such compact, if any, between the States of Arizona, California, and Nevada,

or any two thereof, for the equitable division of the benefits, including power, arising from the use of water accruing to said States, subsidiary to and consistent with said Colorado River compact, which may be negotiated and approved on or before January 1, 1929; and the terms of any such compact concluded between said States and approved and consented to by Congress after said date: Provided, That in the latter case such compact shall be subject to all contracts, if any, made by the Secretary of the Interior under section 5 hereof prior to the date of such approval and consent by Congress.

Sec. 9. That all lands of the United States found by the Secretary of the Interior to be practicable of irrigation and reclamation by the irrigation works authorized herein shall be withdrawn from public entry. Thereafter, at the direction of the Secretary of the Interior, such lands shall be opened for entry, in tracts varying in size but not exceeding one hundred and sixty acres, as may be determined by the Secretary of the Interior, in accordance with the provisions of the reclamation law, and any such entryman shall pay an equitable share in accordance with the benefits received, as determined by the said Secretary, of the construction cost of said canal and appurtenant structures; said payments to be made in such installments and at such times as may be specified by the Secretary of the Interior, in accordance with the provisions of the said reclamation law, and shall constitute revenue from said project and be covered into the fund herein provided for: Provided, That all persons who have served in the United States Army, Navy, or Marine Corps during the war with Germany, the war with Spain, or in the suppression of the insurrection in the Philippines, and who have been honorably separated or discharged therefrom or placed in the Regular Army or Navy Reserve, shall have the exclusive preference right for a period of three months to enter said lands, subject, however, to the provisions of subsection (c) of section 4, Act of December 5, 1924 (Forty-third Statutes at Large, page 702); and also, so far as practicable, preference shall be given to said persons in all construction work authorized by this Act: Provided further, That in the event such an entry shall be relinquished at any time prior to actual residence upon the land by the entryman for not less than one year, lands so relinquished shall not be subject to entry for a period of sixty days after the filing and notation of the relinquishment in the local land office, and after the expiration of said sixty-day period such lands shall be open to entry, subject to the preference in this section provided.

Sec. 10. That nothing in this Act shall be construed as modifying in any manner the existing contract, dated October 23, 1918, between the United States and the Imperial Irrigation District, providing for a connection with Laguna Dam; but the Secretary of the Interior is authorized to enter into contract or contracts with the said district or other districts, persons, or agencies for the construction, in accordance with this Act, of said canal and appurtenant structures, and also for the operation and maintenance thereof, with the consent of the other users.

Sec. 11. That the Secretary of the Interior is hereby authorized to make such studies, surveys, investigations, and do such engineering as may be necessary to determine the lands in the State of Arizona that should be embraced within the boundaries of a reclamation project, heretofore commonly known and hereafter to be known as the Parker-Gila Valley reclamation project, and to recommend the most practicable and feasible method of irrigating lands within said project, or units thereof, and the cost of the same; and the appropriation of such sums of money as may be necessary for the aforesaid purposes from time to time is hereby authorized. The Secretary shall report to Congress as soon as practicable, and not later than December 10, 1931, his findings, conclusions, and recommendations regarding such project.

Sec. 12. "Political subdivision" or "political subdivisions" as used in this Act shall be understood to include any State, irrigation or other district, municipality, or other governmental organization.

"Reclamation law" as used in this Act shall be understood to mean that certain Act of the Congress of the United States approved June 17, 1902, entitled "An Act appropriating the receipts from the sale and disposal of public land in certain States and Territories to the construction of irrigation works for the reclamation of arid lands," and the Acts amendatory thereof and supplemental thereto.

"Maintenance" as used herein shall be deemed to include in each instance provision for keeping the works in good operating condition.

"The Federal Water Power Act," as used in this Act, shall be understood to mean that certain Act of Congress of the United States approved June 10, 1920, entitled "An Act to create a Federal Power Commission; to provide for the improvement of navigation; the development of water power; the use of the public lands in relation thereto; and to repeal section 18 of the River and Harbor Appropriation Act, approved August 8, 1917, and for other purposes," and the Acts amendatory thereof and supplemental thereto.

"Domestic" whenever employed in this Act shall include water uses defined as "domestic" in said Colorado River compact.

Sec. 13. (a) The Colorado River compact signed at Santa Fe, New Mexico, November 24, 1922, pursuant to Act of Congress approved August 19, 1921, entitled "An Act to permit a compact or agreement between the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming respecting the disposition and apportionment of the waters of the Colorado River, and for other purposes," is hereby approved by the Congress of the United States, and the provisions of the first paragraph of article 11 of the said Colorado River compact, making said compact binding and obligatory when it shall have been approved by the legislature of each of the signatory States, are hereby waived, and this approval shall become effective when the State of California and at least five of the other States mentioned, shall have approved or may hereafter approve said compact as aforesaid and shall consent to such waiver, as herein provided.

(b) The rights of the United States in or to waters of the Colorado River and its tributaries howsoever claimed or acquired, as well as the rights of those claiming under the United States, shall be subject to and controlled by said Colorado River compact.

(c) Also all patents, grants, contracts, concessions, leases, permits, licenses, rights of way, or other privileges from the United States or under its authority, necessary or convenient for the use of waters of the Colorado River or its tributaries, or for the generation or transmission of electrical energy generated by means of the waters of said river or its tributaries, whether under this Act, the Federal Water Power Act or otherwise shall be upon the express condition and with the express covenant that the rights of the recipients or holders thereof to waters of the river or its tributaries, for the use of which the same are necessary, convenient, or incidental, and the use of the same shall likewise be subject to and controlled by said Colorado River compact.

(d) The conditions and covenants referred to herein shall be deemed to run with the land and the right, interest, or privilege therein and water right, and shall attach as a matter of law, whether set out or referred to in the instrument evidencing any such patent, grant, contract, concession, lease, permit, license, right of way, or

other privilege from the United States or under its authority, or not, and shall be deemed to be for the benefit of and be available to the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming, and the users of water therein or thereunder, by way of suit, defense, or otherwise, in any litigation respecting the waters of the Colorado River or its tributaries.

Sec. 14. This Act shall be deemed a supplement to the reclamation law, which said reclamation law shall govern the construction, operation, and management of the works herein authorized, except as otherwise herein provided.

Sec. 15. The Secretary of the Interior is authorized and directed to make investigation and public reports of the feasibility of projects for irrigation, generation of electric power, and other purposes in the States of Arizona, Nevada, Colorado, New Mexico, Utah, and Wyoming for the purpose of making such information available to said States and to the Congress, and of formulating a comprehensive scheme of control and the improvement and utilization of the water of the Colorado River and its tributaries. The sum of \$250,000 is hereby authorized to be appropriated from said Colorado River Dam fund, created by section 2 of this Act, for such purposes.

Sec. 16. In furtherance of any comprehensive plan formulated hereafter for the control, improvement, and utilization of the resources of the Colorado River system and to the end that the project authorized by this Act may constitute and be administered as a unit in such control, improvement, and utilization, any commission or commissioner duly authorized under the laws of any ratifying State in that behalf shall have the right to act in an advisory capacity to and in cooperation with the Secretary of the Interior in the exercise of any authority under the provisions of sections 4, 5, and 14 of this Act, and shall have at all times access to records of all Federal agencies empowered to act under said sections, and shall be entitled to have copies of said records on request.

Sec. 17. Claims of the United States arising out of any contract authorized by this Act shall have priority over all others, secured or unsecured.

Sec. 18. Nothing herein shall be construed as interfering with such rights as the States now have either to the waters within their borders or to adopt such policies and enact such laws as they may deem necessary with respect to the appropriation, control, and use of waters within

their borders, except as modified by the Colorado River compact or other interstate agreement.

Sec. 19. That the consent of Congress is hereby given to the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming to negotiate and enter into compacts or agreements, supplemental to and in conformity with the Colorado River compact and consistent with this Act for a comprehensive plan for the development of the Colorado River and providing for the storage, diversion, and use of the waters of said river. Any such compact or agreement may provide for the construction of dams, headworks, and other diversion works or structures for flood control, reclamation, improvement of navigation, division of water, or other purposes and/or the construction of power houses or other structures for the purpose of the development of water power and the financing of the same; and for such purposes may authorize the creation of interstate commissions and/or the creation of corporations, authorities, or other instrumentalities.

(a) Such consent is given upon condition that a representative of the United States, to be appointed by the President, shall participate in the negotiations and shall make report to Congress of the proceedings and of any compact or agreement entered into.

(b) No such compact or agreement shall be binding or obligatory upon any of such States unless and until it has been approved by the legislature of each of such States and by the Congress of the United States.

Sec. 20. Nothing in this Act shall be construed as a denial or recognition of any rights, if any, in Mexico to the use of the waters of the Colorado River system.

Sec. 21. That the short title of this Act shall be "Boulder Canyon Project Act."

Approved, December 21, 1928.

## APPENDIX B

## COLORADO RIVER COMPACT

Signed at Santa Fe, New Mexico

November 24, 1922

The States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming, having resolved to enter into a compact under the Act of Congress of the United States of America approved August 19, 1921 (42 Statutes at Large, page 171), and the Acts of the Legislatures of the said States, have through their Governors appointed as their Commissioners:

W. S. Norviel, for the State of Arizona,  
W. F. McClure, for the State of California,  
Delph E. Carpenter, for the State of Colorado,  
J. G. Scrugham, for the State of Nevada,  
Stephen B. Davis, Jr., for the State of New Mexico,  
R. E. Caldwell, for the State of Utah,  
Frank C. Emerson, for the State of Wyoming,

who, after negotiations participated in by Herbert Hoover, appointed by the President as the representative of the United States of America, have agreed upon the following articles:

## ARTICLE I

The major purposes of this compact are to provide for the equitable division and apportionment of the use of the waters of the Colorado River System; to establish the relative importance of different beneficial uses of water; to promote interstate comity; to remove causes of present and future controversies; and to secure the expeditious agricultural and industrial development of the Colorado River Basin, the storage of its waters, and the protection of life and property from floods. (To these ends the Colorado River Basin is divided into two Basins, and an apportionment of the use of part of the water of the Colorado River System is made to each of them with the provision that further equitable apportionments may be made.)

## ARTICLE II

As used in this compact:

(a) The term "Colorado River System" means that portion of the Colorado River and its tributaries within the United States of America.

(b) The term "Colorado River Basin" means all of the drainage area of the Colorado River system and all other territory within the United States of America to which the waters of the Colorado River System shall be beneficially applied.

(c) The term "States of the Upper Division" means the States of Colorado, New Mexico, Utah, and Wyoming.

(d) The term "States of the Lower Division" means the States of Arizona, California, and Nevada.

(e) The term "Lee Ferry" means a point in the main stream of the Colorado River one mile below the mouth of the Paria River.

(f) The term "Upper Basin" means those parts of the States of Arizona, Colorado, New Mexico, Utah, and Wyoming within and from which waters naturally drain into the Colorado River System above Lee Ferry, and also all parts of said States located without the drainage area of the Colorado River System which are now or shall hereafter be beneficially served by waters diverted from the system above Lee Ferry.

(g) The term "Lower Basin" means those parts of the States of Arizona, California, Nevada, New Mexico, and Utah within and from which waters naturally drain into the Colorado River System below Lee Ferry, and also all parts of said States located without the drainage area of the Colorado River System which are now or shall hereafter be beneficially served by waters diverted from the system below Lee Ferry.

(h) The term "domestic use" shall include the use of water for household, stock, municipal, mining, milling, industrial, and other like purposes, but shall exclude the generation of electrical power.

### ARTICLE III

(a) There is hereby apportioned from the Colorado River system in perpetuity to the Upper Basin and to the Lower Basin, respectively, the exclusive beneficial consumptive use of 7,500,000 acre-feet of water per annum, which shall include all water necessary for the supply of any rights which may now exist.

(b) In addition to the apportionment in paragraph (a), the Lower Basin is hereby given the right to increase its beneficial consumptive use of such waters by one million acre-feet per annum.

(c) If, as a matter of international comity, the United States of America shall hereafter recognize in the United States of Mexico any right to the use of any waters of the Colorado River System, such waters shall be supplied first from the waters which are surplus over and above the aggregate of the quantities specified in paragraphs (a) and (b); and if such surplus shall prove insufficient for this purpose, then the burden of such deficiency shall be equally borne by the Upper Basin and the Lower Basin, and whenever necessary the States of the Upper Division shall deliver at Lee Ferry water to supply one-half of the deficiency so recognized in addition to that provided in paragraph (d).



(d) The States of the Upper Division will not cause the flow of the river at Lee Ferry to be depleted below an aggregate of 75,000,000 acre-feet for any period of ten consecutive years reckoned in continuing progressive series beginning with the first day of October next succeeding the ratification of this compact.

(e) The States of the Upper Division shall not withhold water, and the States of the Lower Division shall not require the delivery of water, which can not reasonably be applied to domestic and agricultural uses.

(f) Further equitable apportionment of the beneficial uses of the waters of the Colorado River System unapportioned by paragraphs (a), (b), and (c) may be made in the manner provided in paragraph (g) at any time after October first, 1963, if and when either Basin shall have reached its total beneficial consumptive use as set out in paragraphs (a) and (b).

(g). In the event of a desire for a further apportionment as provided in paragraph (f) any two signatory States, acting through their Governors, may give joint notice of such desire to the Governor of the other signatory States and to the President of the United States of America forthwith to appoint representatives, whose duty it shall be to divide and apportion equitably between the Upper Basin and Lower Basin the beneficial use of the unapportioned water of the Colorado River System as mentioned in paragraph (f), subject to the legislative ratification of the signatory States and to the Congress of the United States of America.

#### ARTICLE IV

(a) Inasmuch as the Colorado River has ceased to be navigable for commerce and the reservation of its waters for navigation would seriously limit the development of its basin, the use of its waters for purposes of navigation shall be subservient to the uses of such waters for domestic, agricultural, and power purposes. If the Congress shall not consent to this paragraph, the other provisions of this compact shall nevertheless remain binding.

(b) Subject to the provisions of this compact, water of the Colorado River System may be impounded and used for the generation of electrical power, but such impounding and use shall be subservient to the use and consumption of such water for agricultural and domestic purposes and shall not interfere with or prevent use for such dominant purposes.

(c) The provisions of this article shall not apply to or interfere with the regulation and control by any State within its boundaries of the appropriation, use and distribution of water.

## ARTICLE V

The chief official of each signatory State charged with the administration of water rights, together with the Director of the United States Reclamation Service and the Director of the United States Geological Survey, shall cooperate, ex officio:

(a) To promote the systematic determination and coordination of the facts as to flow, appropriation, consumption, and use of water in the Colorado River Basin, and the interchange of available information in such matters.

(b) To secure the ascertainment and publication of the annual flow of the Colorado River at Lee Ferry.

(c) To perform such other duties as may be assigned by mutual consent of the signatories from time to time.

## ARTICLE VI

Should any claim or controversy arise between any two or more of the signatory States: (a) with respect to the waters of the Colorado River System not covered by the terms of this compact; (b) over the meaning or performance of any of the terms of this compact; (c) as to the allocation of the burdens incident to the performance of any article of this compact or the delivery of waters as herein provided; (d) as to the construction or operation of works within the Colorado River Basin to be situated in two or more States, or to be constructed in one State for the benefit of another State; or (e) as to the diversion of water upon the request of one of them, shall forthwith appoint Commissioners with power to consider and adjust such claim or controversy, subject to ratification by the Legislatures of the States so affected.

Nothing herein contained shall prevent the adjustment of any such claim or controversy by any present method or by direct future legislative action of the interested States.

## ARTICLE VII

Nothing in this compact shall be construed as affecting the obligations of the United States of America to Indian tribes.

## ARTICLE VIII

Present perfected rights to the beneficial use of waters of the Colorado River System are unimpaired by this compact. Whenever storage capacity of 5,000,000 acre-feet shall have been provided on the main Colorado River within or for the benefit of the Lower Basin, then claims of such rights, if any, by appropriators or users of water in the Lower Basin against appropriators or users of water in the Upper Basin shall attach to and be satisfied from water that may be stored not in conflict with Article III.

All other rights to the beneficial use of waters of the Colorado River System shall be satisfied solely from the water apportioned to that basin in which they are situate.

#### ARTICLE IX

Nothing in this compact shall be construed to limit or prevent any State from instituting or maintaining any action or proceeding, legal or equitable, for the protection of any right under this compact or the enforcement of any of its provisions.

#### ARTICLE X

This compact may be terminated at any time by the unanimous agreement of the signatory States. In the event of such termination all rights established under it shall continue unimpaired.

#### ARTICLE XI

This compact shall become binding and obligatory when it shall have been approved by the Legislatures of each of the signatory States and by the Congress of the United States. Notice of approval by the Legislatures shall be given by the Governor of each signatory State to the Governors of the other signatory States and to the President of the United States, and the President of the United States is requested to give notice to the Governors of the signatory States of approval by the Congress of the United States.

In witness whereof the Commissioners have signed this compact in a single original, which shall be deposited in the archives of the Department of State of the United States of America and of which a duly certified copy shall be forwarded to the Givernor of each of the signatory States.

Done at the City of Santa Fe, New Mexico, this twenty-fourth day of November, A. D. one thousand nine hundred and twenty-one.

(Signed) W. S. Norviel  
 (Signed) W. F. McClure  
 (Signed) Delph E. Carpenter  
 (Signed) J. G. Scrugham  
 (Signed) Stephen B. Davis, Jr.  
 (Signed) R. E. Caldwell  
 (Signed) Frank C. Emerson

Approved:

(Signed) Herbert Hoover

## APPENDIX C

## KINKAID ACT

## Historical Note

The Kinkaid Act is the outgrowth of the original bill introduced in Congress. This original bill, introduced by Congressman Wm. Kettner at the instigation of the Imperial Irrigation District, was to provide for an All-American Canal. When this bill came before the Congressional Committee it was felt that the information available was inadequate and in order to provide more accurate data on which to proceed, the so-called Kinkaid Act was adopted. This Act took its name from Congressman Kinkaid, who was Chairman of the House Committee on Irrigation and Reclamation.

As a result of this Act a report was rendered by the Honorable Albert B. Fall, Secretary of the Interior, under date of February 28, 1922, and this report was published as Senate Document 142, 67th Congress, Second Session, March 13, 1922.

Subsequent legislation was based on this report. The report has come to be commonly known as Document 142 and is usually referred to as such. It was prepared under the direction of Mr. A. P. Davis, then Director of Reclamation. (J. L. B.)

ACT OF MAY 18, 1920 (41 Stat., 600)

An act to provide for an examination and report on the condition and possible irrigation development of the Imperial Valley in California.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled. That the Secretary of the Interior is hereby authorized and directed to have an examination made of the Imperial Valley in the State of California, with a view of determining the area, location,

and general character of the public and privately owned un-irrigated lands in said valley which can be irrigated at a reasonable cost, and the character, extent, and cost of an irrigation system, or of the modification, improvement, enlargement, and extension of the present system, adequate, and dependable for the irrigation of the present irrigated area in the said valley, and of the public and privately owned lands in said valley and adjacent thereto not now under irrigation which can be irrigated at a reasonable cost from known sources of water supply by diversion of water from the Colorado River at Laguna Dam.

Sec. 2. That the said Secretary shall report to Congress not later than the 6th day of December, 1920, the result of his examination, together with his recommendation as to the feasibility, necessity, and advisability of the undertaking or the participation by the United States, in a plan of irrigation development with a view of placing under irrigation the remaining unirrigated public and privately owned lands in said valley and adjacent thereto, in connection with the modification, improvement, enlargement, and extension of the present irrigation systems of the said valley.

Sec. 3. That the said Secretary shall report in detail as to the character and estimated cost of the plan or plans on which he may report, and if the said plan or plans shall include storage, the location, character, and cost of said storage, and the effect on the irrigation development of other sections or localities of the storage, recommended and the use of the stored water in the Imperial Valley and adjacent lands.

Sec. 4. That the said Secretary shall also report as to the extent, if any, to which, in his opinion, the United States should contribute to the cost of carrying out the plan or plans which he may propose; the approximate proportion of the total cost that should be borne by the various irrigation districts or associations or other public or private agencies now organized or which may be organized; and the manner in which their contribution should be made; also to what extent and in what manner the United States should control, operate, or supervise the carrying out of the plan proposed, and what assurances he has been able to secure as to the approval of, participation in, and contribution to the plan or plans proposed by the various contributing agencies.

Sec. 5. That, for the purpose of enabling the Secretary of the Interior to pay not to exceed one-half of the cost of the examinations and report herein provided for, there is hereby authorized to be appropriated the sum of \$20,000: Provided, That no expenditure shall be made or obligation incurred hereunder by the Secretary of the Interior until provision shall have been made for the payment of at least one-half the cost of the examination and report herein provided for by associations and agencies interested in the irrigation of the lands of the Imperial Valley.

Approved May 18, 1920.

## APPENDIX D

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
Bureau of Reclamation  
Washington

December 1, 1929.

GENERAL INFORMATION CONCERNING THEBOULDER CANYON PROJECT

## Approval of Boulder Canyon Project Act

1. On December 21, 1928, the President approved the Boulder Canyon Project Act, which authorizes the construction by the Secretary of the Interior of the Boulder Dam and incidental works on the Colorado River. The project includes:

## Boulder Dam

(a) The construction of the Boulder Dam, in Black Canyon, where the Colorado River forms the boundary between the States of Arizona and Nevada. This construction will raise the present surface of the water 550 feet. The dam site is about 30 miles southeast of Las Vegas, Nevada, a town with a present population of about 5,500, located on the Los Angeles and Salt Lake line of the Union Pacific System. The dam will create a reservoir with a capacity of about 26,000,000 acre-feet of water. It will serve to impound the surplus flood waters of the Colorado River for use in irrigation and will also regulate the flow of the river so as to improve navigation and protect the lands in the valleys adjacent to the river below the dam and in the Imperial Valley in California, from overflow, water shortage, and silt accumulation, which are at present a great menace to agriculture. Consideration is now being given to a plan for increasing the height of the dam, by 25 feet, and the capacity of the reservoir to 30,000,000 acre-feet.

## Hydroelectric Power Plant

(b) The development of 1,000,000 horsepower hydroelectric energy at the dam, with 550,000 constant horsepower available at all times.

## All-American Canal

(c) The construction of an All-American Canal from Laguna Dam, or other suitable diversion dam, to connect with the present irrigation distribution system in the Imperial Valley in California, a distance of about 75 miles, and an extension to the Coachella Valley, also in California. Preliminary surveys and other studies are now in progress under a cooperative agreement with the Imperial and Coachella Valley irrigation districts. (Note: The Laguna Dam is already constructed and is located on the Colorado River about 9 miles northeast of Yuma, Arizona.)

#### Authority for an Appropriation

2. The Act authorizes an appropriation of \$165,000,000. It is expected that it will take seven years to complete the dam from the time construction is begun. It is proposed to install units of the power plant progressively as rapidly as demand for power develops..

#### Temperature at the Dam Site

3. The temperature at the dam site varies from a minimum of 20 degrees F. to a maximum of 120 degrees F. above zero.

#### Land withdrawals.

4. All public lands in the immediate vicinity of the dam and reservoir sites have been withdrawn from entry for construction purposes.

#### Restoration and opening lands to entry

5. All public lands which will be irrigated under the Boulder Canyon project have been withdrawn from entry and will not be available for settlement until the dam is completed and water can be furnished for irrigation purposes. The lands, when restored, are to be subject to entry under the reclamation law, and preference right of entry is to be given to ex-service men. As before mentioned, the construction of the dam will require approximately seven years, so that it will be a number of years before irrigation water will be available and the land to be irrigated opened to settlement and development. There are no irrigable lands in the immediate vicinity of the reservoir, such lands as are susceptible of irrigation under this project being mainly in the vicinity of Parker, Arizona, in the areas tributary to the Yuma project in Arizona, the Palo Verde or Blythe project, California, and lands in the Imperial and Coachella valleys of California.

#### Act now effective, but appropriation not yet made

6. The Boulder Canyon Project Act does not appropriate any funds for the work, and before such appropriations are made (Section 4 (b) of the Act) contracts must be secured sufficient in the judgment of the Secretary of the Interior to meet operation and maintenance expenses and to insure repayment within 50 years of the construction cost, together with interest thereon at the rate of 4 per cent per annum. Applications totaling much more than the capacity of the power plant have been submitted, and the allocation of power is now under consideration by the Secretary of the Interior. Before the Act became effective, certain conditions had to be met, namely:

(a) Ratification of the Colorado River Compact by the seven basin States (Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming) on or before June 21, 1929, or after that date by at least six of the seven States, one of which must be California; (b) issuance by the President of public proclamation thereof; (c) agreement by the State of California that its annual consumptive use of Colorado River water shall not exceed 4,400,000 acre-feet of the waters apportioned to the lower basin States, plus not more than one-half of any excess or surplus waters unapportioned by the compact. Condition (a) has been met by the ratification of the compact by all of the seven States except Arizona, and (b) and (c) have also been met.

7. It will take considerable time for field surveys and investigations, technical studies, preparation of designs and specifications and the issuance of advertisements, so that it will be several months and possibly longer before contracts can be let for construction of the dam. It is necessary to emphasize this in order to correct the general impression which seems to prevail that a large construction force is to be organized at once. It will be apparent, therefore, that no action can be taken at this time on applications for employment and concession privileges or on inquiries regarding the procurement of construction equipment and materials.

#### Construction of railroad.

8. As a preliminary to the dam construction it will be necessary to build a construction railroad about 30 miles long, to connect the main line of the Union Pacific near Las Vegas, Nevada, with the dam site. It will also be necessary to provide electric power for use during the construction period.

#### Contract policy of Department.

9. Following the present policy of the Department of the Interior, it is expected that all construction will be done by contract, but no decision has been reached in regard to this. If contracted, by far the larger number of men engaged on this work will be employed directly by the construction contractors, including practically all those in positions such as laborer, helper, cook, steward, skilled mechanic, storehouseman, time-keeper, costkeeper, truck driver, foreman, construction superintendent, etc.

#### Purchase of construction equipment

10. If done by contract, the contractors, and not the United States will purchase and furnish all construction equipment required on the work.

#### Purchase of materials.

11. Materials required, such as cement, lumber (except form lumber), reinforcing steel, etc., and permanent operating equipment such as pipe, outlet gates, valves, etc., will be purchased by the United States, but only after appropriate advertisement.

#### Concessions policy.

12. It is too early to determine the policy that may be adopted in the matter of concessions at the dam site. On contract work the general contractor usually supervises, controls, and operates the major concessions, especially those located in the construction camps, such as commissary, dormitories, mess houses, hospital, etc. Should it be considered advisable to grant a limited number of concessions to others, a suitable area may be set aside in a townsite for such purposes. Under present regulations it is customary to grant such privileges only under competitive bids received after public advertisement.

#### Government townsite

13. Plans are being made for a town on the brink of the Colorado River for the housing of the workmen who will construct Boulder Dam, and of their families and the normal population necessary to their comfortable existence. The town will be



located on Government land. The Government will retain ownership of the land and lease it to those who live on it or use it for commercial purposes. One of the features of these leases will be that they will continue only under the period of good behavior of the tenant. It is the intention of the Government that the bootlegger or other law violator shall not interfere with the well-being of its workmen while assigned to this huge task. The power to terminate leases, and therefore residence, in this town will be used as one of the means of enforcing proper conduct. With the workmen and their families and those who are drawn to the dam site by the general activity, it is estimated that this town will have a population of some 4,000 people. With the construction of automobile highways from Las Vegas, Nevada, and Kingman, Arizona, to the dam, it will then become possible for tourists on a transcontinental trip to drive over the dam and see the world's largest artificial reservoir. Eventually this will doubtless become a popular route for travel.

#### Government organization.

14. If the work is done by contract, a certain organization will be required by the United States to handle the inspection, engineering, and supervision. All employments on the Government rolls will be in strict accordance with the rules and regulations of the United States Civil Service Commission. To be eligible for appointment in the classified civil service, applicants must first qualify through appropriate competitive examinations.

#### Maps for sale

15. The following maps of the Colorado River Basin are for sale and can be obtained from either the Washington or Denver office. Remittance should be by money order or check payable to the Bureau of Reclamation. Stamps will not be accepted.

Map No. 23566 - Colorado River Basin below Boulder Dam.  
8 x 10 inches. Scale 40 miles to an inch. 5 cents.

Map No. 23000 - Colorado River Basin (in colors).  
20 x 22 inches. Scale 40 miles to an inch. 25 cents.

Map No. 23530-A - Lower Colorado River, Imperial Valley and Boulder Canyon Reservoir, with textual overprint in red giving considerable data on the Boulder Canyon project and the lower Colorado River Basin. 25 cents.

Map No. 23800 - Boulder Canyon reservoir site topography; also dam site topography, reservoir area and capacity curves, river profile and profile of dam site. 21 x 37 inches. Printed in colors. 25 cents. (In preparation.)

Map No. 23750 - Same information as on No. 23800, but black only and on larger scale. 33 x 55 inches. 25 cents.

Map No. 23530 - Lower Colorado River, Imperial Valley  
and Boulder Canyon Reservoir. 18 x 34  
inches. Scale 9 miles to an inch.  
20 cents.

Chart No. 23640 - Synopsis of Boulder Canyon Project  
Act. 5 cents.

Establishment of field office

16. Eventually an office of this bureau will be established either in Las Vegas, Nevada, or at the Boulder Dam site near Las Vegas. For the time being all communications regarding this proposed project should be addressed to the Commissioner, Bureau of Reclamation, Washington, D. C., or to the Chief Engineer, Bureau of Reclamation, Wilda Building, Denver, Colorado; but it is again emphasized that it will be several months at least before contracts can be let for the construction of the dam.

ELWOOD MEAD,

Commissioner.

## APPENDIX E

### EXPLANATION OF TERMS

The following definitions and terms have been compiled from the Arizona-Colorado River Commission; and the Colorado River Commission of California.

1. Boulder Canyon Project Act:

An act to provide for the construction of works for the protection and development of the Colorado River Basin.

2. Colorado River Compact:

A compact or agreement between the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming, respecting the disposition and apportionment of the waters of the Colorado River, and for other purposes. The compact as originally drawn was between the seven States as listed above but due to the failure of Arizona to ratify the compact, it was afterwards modified to include only the States of California, Colorado, Nevada, New Mexico, Utah, and Wyoming.

3. The Colorado River System:

This term is used in the Seven State Compact. It means the main Colorado River, together with its tributaries.

4. The Colorado River Basin:

Again this term is used by the Seven State Compact. It means all the drainage area of the Colorado River System, and all other territory within the United States to which the waters of the Colorado River shall be beneficially applied. The States in the river basin are Colorado, Wyoming, Utah, New Mexico, Arizona, California, and Nevada.

5. The Upper Basin:

The Upper Basin includes those parts of four states whose waters drain into the Colorado River. They are Colorado, Wyoming, Utah, and New Mexico.

6. The Lower Basin:

The Lower Basin includes Arizona, California, and Nevada. It should be noted that Arizona, New Mexico, and Utah are partly in both basins. The reason: that a small part of the Gila River is in New Mexico, and a part of the San Juan is in Utah; also, a part of the Virgin is in Utah and Nevada. The dividing line in the apportionment of waters between the Upper and Lower Basin as made by the Seven State Compact, is at Lee's Ferry, which is near the north line of Arizona.

7. Santa Fe Compact:

Same as Colorado River Compact. Signed in Santa Fe, New Mexico, November, 1922.

8. Lee's Ferry:

A point in the main stream of the Colorado River and its tributaries one mile below the mouth of the Paria River, in northern Arizona.

9. Domestic Use:

Shall include the use of water for household, stock, municipal, mining, milling, industrial, and other like purposes, but shall exclude the generation of electrical power.

10. Acre-foot:

Quantity of water required to cover one acre of land one foot deep.

11. Second-foot:

An abbreviation for cubic foot per second and is the unit for the rate of discharge of water flowing in a stream 1 foot wide, 1 foot deep, at the rate of 1 foot per second.

12. Water Duty:

Number of acre-feet of water used on an acre of irrigated land in one year.

13. Gravity Water:

Means water which is taken directly from a river or from behind the Dam and flows through a system of canals or conduits directly onto land without being pumped.

14. Pump Water:

Means water which is used on land above the level of the canals or river and has to be pumped to these higher elevations. The distance in height that the water has to be pumped is known as the pump lift. For instance, if water had to be pumped from a canal up into another canal at 100 feet higher elevation, it would be spoken of as a pump lift of 100 feet.

15. Beneficial Use of Water:

Beneficial use is where one applies water for the benefit of person or property. The owner may furnish drinking water, run a mill to grind grains or ores, to wash placer lands, or to irrigate land and thereby raise crops. Whichever way used, the owner is said to be applying it to a beneficial use.

16. Consumptive Use:

This term means where water is consumed. An illustration of consumptive use is where a farmer takes through a ditch four acre-feet of water a year. He puts it over all his land, but one acre-foot runs off through his waste ditch back to the river. Another acre-foot runs down through the land striking a gravel bed and drains back into the river--thus there has been only two acre-feet consumed. This two acre-feet used up is called the consumptive use.

17. Recapture:

This is a term commonly used in connection with discussions of power and refers to the right of some agency to take power some time in the

future that has been previously used by some other agency, or in other words, it is the right, some time in the future, to take away from somebody already using it a certain amount of power.

18. Firm Water or Title Water:

The water to which the right to use is not questioned in any way is known as firm or title water. The firm water and the excess water together make up the water which is actually physically present in the stream or in the system.

19. Riparian Doctrine:

Was the common law right of an owner of land bordering upon a stream or body of water to have the water retain its natural character; that is, not to be diminished to any extent; to have it remain unpolluted, and to have its use, if a stream, as it flows by his land for milling and domestic purposes, to have free access for wharves, and for many other uses and benefits which the riparian owner had. This doctrine does not exist in any of our arid states, except that in one of the Seven States of the River System, viz, California, the Riparian Doctrine is in part maintained.

20. Appropriation Doctrine:

This doctrine relating to the use of water, is the one which controls in most of the arid States of the Union. It is the right of one to take water from a stream or ditch to his land, mill, mine, placer, farm or other works, and apply that water to some beneficial use. Unlike the riparian right, it may be taken a long distance from the stream or lake, although the effect of taking it reduces the water in the main stream. The right depends not on the place where taken, but rather upon the application by the taker to some beneficial use. The right is initiated by complying with the law of the state where the appropriation is made, and these requirements differ in some respects in many of the western states. In some, the person appropriating the water must place a written notice stating the amount of his appropriation at a point on the stream or lake where the diversion of water is made, that is, where the head gate of his ditch is to be located. He

must record the notice in the proper county or state office, procure a permit from the State Engineer or State Water Commissioner, and build his ditch from the river or lake to his works or to his farm. But whatever the requirements are, they initiate only a right to the water. The appropriation becomes complete only when the water is actually applied to some beneficial use. When it is so applied, say for instance to irrigate a farm, it is then said to be a "vested right." When one has a vested right to water through appropriation, it is subject only to some prior appropriation of the water, and an owner cannot be divested of the right to the use of the water except by due process of the law.

## APPENDIX F

## BOULDER DAM PROJECT

BY THE PRESIDENT OF THE UNITED STATES

## PUBLIC PROCLAMATION

Pursuant to the provisions of Section 4 (a) of the Boulder Canyon Project Act approved December 21, 1928, (45 Stat. 1057), it is hereby declared by Public Proclamation:

(a) That the states of Arizona, California, Colorado, Nevada, New Mexico, Utah and Wyoming have not ratified the Colorado River Compact mentioned in Section 13 (a) of said act of December 21, 1928, within six months from the date of the passage and approval of said act.

(b) That the states of California, Colorado, Nevada, New Mexico, Utah and Wyoming have ratified said compact and have consented to waive the provisions of the first paragraph of Article XI of said compact, which makes the same binding and obligatory only when approved by each of the seven states signatory thereto, and that each of the states last named has approved said compact without condition, except that of six-state approval as prescribed in Section 13 (a) of said act of December 21, 1928.

(c) That the State of California has in all things met the requirements set out in the first paragraph of Section 4 (a) of said act of December 21, 1928, necessary to render said act effective on six-state approval of said compact.



(d) All prescribed conditions having been fulfilled, the said Boulder Canyon Project Act approved December 21, 1928, is hereby declared to be effective this date.

In testimony whereof I have hereunto set my hand and caused the seal of the United States of America to be affixed.

Done at the city of Washington this 25th day of June, in the year of our Lord One Thousand Nine Hundred and Twenty-nine, and of the Independence of the United States of America, the One Hundred and Fifty-third.

By the President:

(signed) Herbert Hoover

Henry L. Stimson.  
Secretary of State.

# BOULDER CANYON PROJECT ACT

PUBLIC No. 642, 70th CONGRESS  
APPROVED DECEMBER 21, 1923

## PURPOSES

1. CONTROL OF FLOODS
2. IMPROVEMENT OF NAVIGATION
3. REGULATION OF FLOW
4. IRRIGATION DEVELOPMENT
5. DOMESTIC WATER SUPPLY
6. GENERATION OF POWER

**BOULDER CANYON PROJECT**  
Authorizes the Secretary of the Interior to construct the Boulder Canyon Project. *Section 1*

### BOULDER DAM

- PURPOSES**
1. River regulation, improvement of navigation and flood control.
  2. Irrigation and domestic water supply. *Section 6*
  3. Power. *Section 6*

**Location:**  
Boulder or Black Canyon.  
**Capacity:**  
Not less than 20,000,000 acre feet. *Section 1*

Irrigable public lands shall be withdrawn to be opened to entry under Reclamation Law, with preference to ex-soldiers, sailors and marines. *Section 9*

Title to works shall forever remain in the United States. *Section 6*

### ALL-AMERICAN CANAL

To connect Laguna or another suitable diversion dam with Imperial and Coachella Valleys. *Sec. 7*

Cost to be reimbursable in accordance with terms of the Reclamation Law. *Section 4(b)*

Title with certain exceptions may be transferred to districts or other agencies after all repayments are made. *Section 7*

No charge shall be made for water for irrigation or potable purposes in Imperial and Coachella Valleys. *Section 1*

Districts may utilize power possibilities on the canal and be credited with net proceeds. *Section 7*

### POWER DEVELOPMENT

**ALTERNATIVES**  
The Secretary of the Interior (a) may build a plant *Sec. 1* and deliver energy at the switchboard *Section 5* (b) lease one or more units of the Gov't built plant *Sec. 6* (c) lease water for generation of power in plants to be built by lessees. *Sec. 8*

Rules and regulations shall conform to requirements and policies of the Federal Water Power Act. *Section 8*

Rates shall assure reasonable returns and may be readjusted periodically as justified by competitive conditions. *Section 5(a)*

**CONTRACTS**  
No contract shall be for longer duration than 50 years, with right of renewal at expiration under then existing laws and regulations. *Section 5(a) and (b)*  
Conflicting applications for contracts to be resolved in conformity with policy of Federal Water Power Act, except that preference shall be given to a State for use in the State. *Section 5(c)*  
Any contractor for 100,000 h. p. or more may be required to permit any contractor for less than 25,000 h. p. to share his transmission lines. *Section 5(d)*

### REVENUES

All revenues shall be paid into the Colorado River Dam Fund. *Section 2(a)*  
Balance available for repayment shall be determined at close of each fiscal year and covered into the U.S. Treasury. *Section 2(b)*

**EXCESS REVENUES**  
Revenues in excess of amortization requirements to be allotted — *Section 2(b)*  
62½ % to flood control repayment. *Section 2(b)*  
18½ % to State of Arizona *Section 4 (b)*  
18½ % to State of Nevada *Section 4 (b)*

After repayment to U. S. of all money advanced, with interest, revenues shall be kept in separate fund and expended within the Colorado River Basin as prescribed by Congress. *Sec. 5*

**COLORADO RIVER DAM FUND**  
Establishes the Colorado River Dam Fund for carrying out the provisions of the Act. *Section 2*

**APPROPRIATIONS**  
Appropriations not to exceed \$155,000,000 in the aggregate are authorized. *Section 2(b)*

Amounts deemed necessary by Secretary of the Interior shall be advanced to the Fund by Secretary of the Treasury, within appropriation limits. Interest to be charged annually at 4½ % on amounts advanced. *Section 2(b)*  
Operation and maintenance expenses to be paid only from appropriations therefor. *Section 2 (c)*

**REPAYMENTS**  
All amounts advanced for operation and maintenance and for construction of the dam and power plant to be repaid with interest within 50 years. *Section 4(b)*  
Expenditures on All-American Canal, including O. and M. to be repaid in manner provided in the Reclamation Law. *Sec. 4*

**FLOOD CONTROL**  
\$25,000,000 is allocated to flood control and is to be repaid from revenues in excess of amortization requirements. *Section 2(b)*

**COLORADO RIVER COMPACT**  
Ratifies the Colorado River Compact and makes other provisions. *Section 13*

### INVESTIGATIONS

Authorizes the appropriation of \$250,000 for investigations to formulate a comprehensive plan for the utilization of Colorado River. *Section 12*

Authorizes investigations of the Parker-Gila Valley reclamation project. *Sec. 11*

### WATER RIGHTS

All rights of the U. S. and its grantees to waters of the Colorado River shall be subject to the Colorado River Compact. *Section 27(b)*

Nothing in the Act shall be construed as a denial or recognition of any rights in Mexico to the use of waters of the Colorado River. *Section 20*

### INTERSTATE COMPACTS

Ratifies Colorado River Compact on behalf of the U. S., 6 or 7 State basis. *Section 13(a)*

Authorizes negotiation of interstate compact supplemental to the Colorado River Compact. *Section 19*

Authorizes tri-state compact between Arizona, California and Nevada. *Section 4 (a)*

### POWER LICENSES

Federal Power Commission is not to issue license except on Gila River until the Act becomes effective. *Sec. 6*

## CONDITIONS

- 1-Not effective until the Colorado River Compact has been ratified by the 7 basin States or after 6 months by California and 5 others. *Sec. 4 (a)*
- 2-Not effective until California agrees to limit her annual consumptive use of Colorado River water to 4,400,000 acre feet plus one-half of any surplus waters unappropriated by the Colorado River Compact. *Sec. 4 (a)*
- 3-No appropriation is to be made for construction until the Secretary of the Interior shall provide by contract for revenues adequate to pay operation and maintenance expenses and meet repayment requirements. *Sec. 4 (c)*
- 4-All operations are to be subject to the Colorado River Compact. *Sec. 8*
- 5-The Act shall be deemed a supplement to the Reclamation Law. *Sec. 14*

DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION  
APRIL 1929

SYNOPSIS OF  
BOULDER CANYON PROJECT ACT  
CHART NO. 23840