

GOLDEN RIVERS AND TREASURE VALLEYS

# The All-Arizona State Plan

## FOR WATER AND SOIL CONSERVATION

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### PREFATORY SUMMARY

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**AUTHOR'S NOTE:** This Prefatory Summary, comprising the following sixteen pages, is a reprint of a pamphlet published in 1935 and not copyrighted. All who desire to promote the cause it advocates are urged to help to give it as wide a circulation as possible.

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The people of Arizona must be aroused to the absolutely inescapable necessity for a State-wide and Nation-wide Campaign to make sure that all rights to the waters of the Colorado river now belonging to Arizona are preserved, perpetuated and made inalienable forever by the actual beneficial use of the water in Arizona.

It is not enough that those rights should be adjudicated.

It is inevitable that ultimately they will be lost to Arizona unless a comprehensive and complete "ALL-ARIZONA STATE PLAN" is made and adopted and the works constructed with due diligence that provide for the beneficial use of the waters within the State of Arizona.

Arizona has the legal right to divert from the Colorado river and devote to beneficial use in Arizona, every drop of water that now flows across the north State line of Arizona provided she exercises that right in good faith and with rea-

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sonable diligence in formulating a plan and constructing the works necessary for the use of the waters in Arizona.

The construction of those works will never be achieved without the whole-hearted co-operation of the people of Arizona to organize and carry forward to success a State and National Campaign similar to that which brought about the enactment of the Newlands National Irrigation Act, the formation of the Water Users Association, the building of the Roosevelt dam, and the system for the diversion and distribution of the waters to the lands of the Salt River Valley.

The same sort of a campaign, fought with the same courage and tireless energy and grim determination, will achieve the establishment of **TEN ARIZONA PROJECTS** each equal in acreage and wealth production to the Roosevelt-Salt River Valley Project, each sustaining a city of 50,000 population or more. In addition to that it will achieve the creation in Arizona of 10,000,000 acres of new rain-making forest plantations. The total acreage developed in Arizona under this plan will be 15,280,000 acres.

The acreage quota of each of the **ARIZONA TEN PROJECTS** would be 500,000 acres,—a total of 5,000,000 acres—of irrigated land for Orchard Homecrofts and Garden Farms for Forest Farm Estates; and 1,000,000 acres for each project,—a total of 10,000,000 acres—for Forest Plantations in twenty-acre tracts for Forest Farm Estates.

The reflow from return seepage under this **ALL-ARIZONA STATE PLAN**, supplemented by increased rainfall due to the reforested 10,000,000 acres, will so largely increase the available water supply on and flowing from the watersheds of Arizona, and the precipitation in Arizona, and on the water sheds of the Colorado river and its tributaries above Arizona, that all interstate conflicts will be thereby avoided.

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The ALL-ARIZONA STATE PLAN includes the inexorable necessity for eliminating all Mexican claims to Colorado River Waters by a treaty patterned after the Gadsden Purchase Treaty, under which Uncle Sam acquired the territory between the Gila river and the present international boundary between our country and Mexico.

The ALL-ARIZONA STATE PLAN is based on sound principles of Water Conservation and Utilization, one of which is that every stream or river should be developed from its source down, in order to get the benefit of reflow from return seepage to the fullest possible extent. Under that principle, the first diversion for the benefit of Arizona should be at the Glen Canyon dam, which is the highest practicable point where storage can be provided with benefit to the upper basin so great and so manifest as to obviate controversy.

The fundamental physical and engineering facts on which the ALL-ARIZONA STATE PLAN is based are set forth in the following maps, documents and Reports:

1. TOPOGRAPHIC MAP OF THE STATE OF ARIZONA, entitled: University of Arizona, Arizona Bureau of Mines, G. M. Butler, Director, in co-operation with Department of the Interior, United States Geological Survey. Topographic Map of the State of Arizona. Prepared by N. H. Darton, Geologist, United States Geological Survey. This Map is made from the meter system. 100 meters is equivalent to 328 feet. The 1000 meter contour is 3281 feet; the 1500 meter contour is 4921 feet; the 2000 meter contour is 6562 feet. This explanation will aid the layman for whose information this book is written.

2. THE LARUE REPORT: entitled: Department of the Interior, Hubert Work, Secretary. U. S.

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Geological Survey, George Otis Smith, Director. Water-Supply Paper 556. Water Power and Flood Control of Colorado River below Green River, Utah. by E. C. LaRue, with a foreword by Hubert Work, Secretary of the Interior. Washington, Government Printing Office, 1925.

3. THE HIGHLINE BOOK: Arizona Highline Reclamation Association, Summary with Maps and Illustrations of Arizona's Rights on Colorado River. Fred T. Colter, Publisher. On page 54 and following, this book contains the Report of the Scott Engineering Company, Phoenix, Arizona, to Arizona Attorney General "on Glen-Bridge-Verde-Highline Water filings, Water rights and Projects, 1932." This report shows the practicability of the diversion of water from the Glen Canyon reservoir into the upper Verde Reservoir. The plan proposed for that diversion in this book—Golden Rivers—by George H. Maxwell, greatly enlarges the far-flung benefits that would result from this diversion, and would cheapen the cost.

4. MAP OF ARIZONA—CALIFORNIA GLEN CANYON-HIGHLINE PROJECT: REPRODUCED from the Congressional Record, showing location of proposed dams and canals and irrigable lands and the plan for a complete power system in Arizona using power from Colorado river. This map is entitled: Map of Lower Basin of Colorado River and Coast Basin of Southern California, showing the two alternative projects for Development, one the "Black Canyon-Boulder Canyon-Lowlane Project," and the other the "Glen Canyon-Bridge Canyon-Highline Project."

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(A copy of the map last referred to can be had by sending three cents for postage to NATIONAL RECLAMATION ASSOCIATION, 602 North First Avenue, Phoenix, Arizona.)

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5. REPORT OF COLORADO RIVER COMMISSION OF ARIZONA—1931-1932—by G. W. P. Hunt, Governor of Arizona, and Homer Wood, Samuel L. Pattee and Thomas Maddock, Commissioners—with its photographs of available damsites and maps of all proposed Colorado River Reclamation Projects and also colored maps showing irrigable areas and areas in Forest Reserves and Indian Reservations in Arizona.

### 15,280,000 ACRES RECLAIMABLE IN ARIZONA.

The possibilities of a stupendous enlargement of the area of irrigable or reclaimable land in Arizona, in excess of the acreages heretofore regarded as reclaimable by the general public in that State, have only recently dawned on a few careful students of Arizona's great stake in the waters of the Colorado River. Their estimates are under rather than over, the amount of water that ultimately will be available for use in Arizona, if it is not filched from her because of lack of vigorous activity on the part of the people of the State. It is my belief that the areas that can be reclaimed in Arizona, if the State is rightly developed, will far exceed a total of 15,280,000 acres of which 10,000,000 acres should be Forest Farm Estates or Forest Plantations of water-creating forests.

The writer's close study of the subject of Arizona's development began in 1882,—over 50 years ago. The Arizona Republican for Wednesday Morning, June 4, 1919, contained an interview from which the following is excerpted:

#### **"THE WAR AGAINST THE DESERTS."**

"It has for years been the dream of the builders of Arizona that ways and means might be found for saving for beneficial use every drop of flood

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water that now goes to waste in the state, often leaving devastation in its wake. The building of the Roosevelt reservoir was a great stride in that direction, but not another such a reservoir site exists in Arizona, and for many years it seemed as though this dream of the builders might never be fulfilled.

“Within the last few years, however, great strides have been made in the science of husbanding water, and it has been found by actual experience that in many respects underground storage may be even more economical and effective than surface storage. In southern California, where no large surface storage reservoirs exist, underground storage has been developed in many localities and its benefits thoroughly proven.

“In many European countries these methods of water storage in the canyons by building retardation works to slow up the run off, have been thoroughly tried out and proved successful, stopping floods at the same time. The Olmsted report on flood control on the Gila river adopts this modern idea and ever since early in the year the work of organization in behalf of the adoption of that report and the construction of the retardation works it recommends has been steadily going forward from one success to another.”

George H. Maxwell returned to Phoenix yesterday after a month spent in the Gila and San Simon valleys and Clifton organizing those localities for co-operation with the entire state of Arizona and with the nation to bring about the adoption in a large way of this entire plan for underground water storage in Arizona, coupling flood prevention and protection with water conservation for the irrigation of arid lands. Mr. Maxwell is even more enthusiastic and confident than when he left Phoenix, that we are on

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the threshold of an immense enlargement of the reclamation resources of Arizona, through the adoption of the Olmsted and Newlands plans for conserving a stupendous volume of flood water that will otherwise continue forever to go to waste. \* \* \*

"In these days when 'reconstruction' is in the air this huge resource must not be neglected, and it will not be if the people of Arizona will take advantage of the opportunity and bring the proposition to the attention of the people of the United States as effectively as the idea of national irrigation was brought to their attention 20 years ago by the National Reclamation Association."

When interviewed on this subject yesterday, Mr. Maxwell made this statement and added:

"The Gila river is the worst flood river in the world. Its control will not only enormously benefit Arizona but will build a model as to how to control floods on any flood stream in the country, and the value of this model, this absolute demonstration, will be worth to the nation vastly more than the entire \$6,000,000 it will cost on the Gila. It will conserve a large volume of flood water that can be used to replenish the underground supplies of the Casa Grande and Maricopa country, and make it possible to standardize the supply for the Gila Bend project so as to insure the success of that project."

Mr. Maxwell has given the subject as careful study as any man living, and he says that beyond question the irrigated and cultivated area in Arizona can be extended ten-fold in the next ten years if the people will stand by the slogan suggested at the convention of the Arizona Association of Cattle Growers "Everybody—All Together—for Arizona," and take advantage of the time, which is now ripe, for interesting the people of the United States at large in the

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wonderful possibilities offered by Arizona to replace the wealth destroyed by the war with new wealth created from new resources, and from resources now wasted, as the flood water is wasted in Arizona—a mine of wealth which is undeveloped and unused.”

Never before in the history of the United States of America was there such a case as that of Arizona and her interest in the Colorado river. The future Life of a Sovereign State of the Union is at stake. Arizona's very existence as a unit of our National Structure depends upon the preservation of her rights to the life-giving waters of the Colorado River.

California has as much to gain as the State of Arizona from the full and complete development of the water resources of the whole Southwest. The commercial and property interests of Los Angeles contributed largely to the success of the campaign which brought the enactment of the Newlands National Irrigation Act in 1902, under which the Roosevelt and Yuma projects were built. In their support first for the Act itself, and then for the building of the Roosevelt and Yuma projects, they were as united and whole-souled as they were for the building of the great breakwater which made Los Angeles a safe world port. Yet for some strange reason, which of course it is not hard to guess, there is a covert influence at work to frustrate every effort to get comprehensive action for anything relating to arid land reclamation in Arizona.

Even when the question was only whether a meritorious project like Paradise-Verde should be built or emasculated, the federal government first favored the project and afterwards rescinded its approval of the \$19,000,000 project, and practically destroyed it by limiting construction to a single reservoir costing an estimated \$4,000,000.

All that was necessary to have made the Paradise-Verde



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project of almost inconceivable benefit to Arizona as a whole, and to the entire United States of America, as an enlargement of its Home Market for American Manufacturers, was a connection with the Colorado river which could have been made for temporary use, with a pump-lift of less than that adopted in Southern California of 1500 to 2000 feet over Shaver's Summit for the Los Angeles Boulder Dam Aqueduct which is now under construction. Ultimately, of course, an all-gravity system will make that pump lift unnecessary.

The great Central Arizona Verde reservoir on the Verde river will have a Water-surface level of 1000 meters,—3281 feet. The Water-surface of the Colorado river just below the mouth of the Little Colorado river is 2700 feet. A dam the same height as the Boulder dam, at that point, which could be constructed much more cheaply than Boulder dam, would add 600 feet to the height of the water surface, raising it to 3300 feet behind the dam.

I am informed that the pump-lift to get over Shaver's Summit is 1700 feet. That same pump-lift would lift the water from the 3300 water surface of the Colorado river reservoir to the 5,000 foot contour. Then the water would flow by gravity in an open canal almost to Holbrook. The elevation of Holbrook is 5079 feet. The hydraulic giant would make short work of the job of bringing Colorado river water to forest plantations and alfalfa fields at Winslow and Holbrook, and by way of the Canyon Diablo to the Verde River Reservoir.

As will be explained in a later Chapter of this book, which will be devoted to the working out of an "All-Arizona" State Plan for utilizing the waters of the Colorado river, so as to make Arizona's rights impregnable, the elevation of the rail-

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road station at Canyon Diablo on the line of this canal from the mouth of the Little Colorado river to Holbrook, is 5431 feet. Canyon Diablo is "some canyon", as anybody who has ever seen it from the railroad car windows, will concede. It is well worth a survey to find out whether that canyon could be deepened and used to run water to the intake of a tunnel that would carry the water to the Central Arizona Verde Reservoir. I believe the tunnel would need to be only thirty or forty miles long if the plan were adopted of cutting a deep open conduit up the Canyon Diablo to a connection, by tunnel, through which the water from the Colorado river would flow into that Verde reservoir—tunneling only so much of the way as might be necessary. Any one interested in this idea of an open cut would do well to study the possibilities of the hydraulic-giant method of moving dirt, and find a dictionary or encyclopedia containing a picture of the Corinth Canal in Greece, to see what the Canyon Diablo would look like if it were turned into a water aqueduct to help Arizona to build new homes and create new forests.

Whenever the Waters of the Colorado river have been put through by gravity from the Colorado river to the Verde river for reservoir replenishment and to supplement the Glen-Bridge-Highline System, as will be done as soon as the best route is ascertained, the Colorado river can be distributed over Arizona to reclaim 5,280,000 acres of new garden-farm homes and 10,000,000 acres of new rain-making forests.

That 1700 foot pump-lift has been suggested only because it illustrates what inconceivable benefits might be achieved for the national interests of the people of this Country of Ours, if Arizona were able to duplicate such works for Colo-

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radio river water-use as our neighbor California is now building with money supplied by the federal government.

It is undoubtedly a fact that the waters of the Colorado river can be brought by gravity from a point of diversion at or above the Bluff Reservoir on the San Juan River, or at the horse-shoe below the Glen Canyon reservoir, or with a pump-lift just below the mouth of the Little Colorado river, to the eastern portal of a tunnel to the Verde river.

THE ULTIMATE REGULATED FLOW OF COLORADO RIVER CAN BE AND WILL BE DIVERTED INTO THE WATERSHED OF THE VERDE RIVER AT THE GREAT CENTRAL ARIZONA VERDE RESERVOIR WITH ITS WATER-SURFACE LEVEL AT 3281 FEET. THAT RESERVOIR WILL BE FORTY MILES LONG.

From that reservoir the water will flow straight south down the Verde river to McDowell Mountain. From that elevation of 3281 feet, it will be carried in a canal southeast to replenish the Roosevelt reservoir, and fill another shallow reservoir higher up the Salt river, and also replenish the Coolidge reservoir, and cross the Gila river above the mouth of the San Pedro, and continue on farther southeast to the upper end of the San Simon valley in Arizona.

The water can be taken from that same Verde reservoir by another canal westward to "Out Wickenburg Way", and spread out over the Butler valley, McMullen valley, Bouse valley, Ranegras plains, and Vicksburg valley, and run through Lone Mountain Pass out over all the Harquahala and Hassayampa plains. It will regulate and replenish the Hassayampa river and supply the Arizona Highline Canal with a full quota of Colorado river water and irrigate the whole

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Centennial Wash drainage basin from close to Wickenburg to Salome and thence to the Gillespie dam, and replenish the Gila with return seepage.

With the Colorado river water replenishing practically every existing irrigation project in Arizona with water diverted from the Colorado river just below the mouth of the Little Colorado, or from the San Juan river or Glen Canyon reservoir, the Little Colorado river and the Bill Williams river and the Verde, Salt and Gila rivers and the Santa Cruz river would all be fully supplied with reflow from seepage from nearly every irrigated field in Arizona. And all the good people of the Salt river valley would be happy because they would be provided with all the water they possibly could use, and a generous surplus supply.

THERE IS NOT THE GHOST OF A CHANCE THAT ALL THE WATERS OF THE COLORADO RIVER BELONGING TO ARIZONA EVER WILL BE USED IN ARIZONA UNLESS A COMPREHENSIVE PLAN FOR THAT USE IS PRESENTED IN BEHALF OF ARIZONA TO THE WHOLE PEOPLE OF THE NATION AND ITS ADOPTION BY THE FEDERAL GOVERNMENT URGED AND SECURED BY ORGANIZED STATE AND NATIONAL EFFORT, JUST AS THE ENACTMENT OF THE NEWLANDS NATIONAL IRRIGATION ACT, OFFICIALLY KNOWN AS THE UNITED STATES RECLAMATION ACT, WAS SECURED IN 1902, AND THE CONSTRUCTION OF THE ROOSEVELT DAM UNDER THAT ACT WAS ACCOMPLISHED, WITH LITTLE HELP FROM ARIZONA.

Today Arizona's problem again is the problem of the whole people of the United States of America. Success must

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be won by the nation and for the nation at large, fighting for national rights and a big national objective that affects and interests every man, woman and child in the United States of America,—no matter who they are or where they live.

Were it not for the complications created by the Mexican interests in their determination to get the water by the law of gravity for their lands in Mexico, it would be an easy matter to adjust the respective interests of Arizona and California,—in fact, it would have been done long ago.

As matters now stand, Los Angeles will doubtless insist on pumping water 1500 or 2000 feet over Shaver's Summit, when they could just as well get it by gravity and save all costs of pumping. Assuming that there can be no change in California's plan, nothing remains but to use the Boulder dam to best advantage, from a national point of view. It must not be allowed to deprive Arizona of any rights.

The Arizona Highline Canal must be built just as it has been so long advocated should be done. Water may be pumped from the Boulder dam into a temporary canal connection from the Boulder Reservoir to the Arizona Highline Canal, so that Arizona may be enabled to use beneficially in Arizona her full quota of the water from the Colorado river without unnecessary delay. This temporary pumping project would be discontinued as soon as the Bridge Canyon dam and the Glen Canyon dam were completed. If California is to pump 1500 to 2000 feet over a range of mountains there should be no objection to Arizona pumping 200 or 300 feet during the intervening period until the Bridge-Glen dams are completed.

A plan that merits consideration arises from the unsafety of the Boulder dam because of its being in an earthquake

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country. Expert engineers have recognized the danger of the destruction of the Boulder dam by an earthquake. This danger cannot be "whistled down the wind." If the dam broke for that reason, large areas in the Imperial Valley of California would be buried from 200 to 300 feet deep under a great inland lake. Every town and city between Boulder dam and the Gulf of Mexico would be utterly destroyed.

The menace of that terrible calamity can be lifted from those communities by making the Boulder dam safe. The way to do that is to strengthen the present concrete structure by building immediately above it a hydraulic-fill up-stream extension of the concrete Boulder dam, all becoming a part of the same great structure. The hydraulic-fill up-stream extension of the Boulder dam would render the structure as a whole impervious to damage by earthquake. As the length of the hydraulic-fill dam would constitute its strength, that part of the dam could be raised two or three hundred feet at its center and used permanently as a storage and diversion dam for the Arizona Highline Canal.

This suggestion, however, probably has no practical value, because the Los Angeles-Mexican interests would prefer to run the risk than to safeguard against the earthquake menace. They would not want to draw attention to that menace by consenting to the construction work necessary to build the hydraulic-fill up-stream extension.

No less than four of the best engineers who have ever studied the subject of dams on the Colorado river have recognized the earthquake danger and planned accordingly. The four referred to are General Goethals of Isthmian canal fame, Epes Randolph, Walter Gordon Clark and Major J. Lee Turley. Epes Randolph's plan was to blast down the sides of the

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canyon and build a rock-fill dam—silt-cemented. The Clark plan was for a steel core, thereby making safe a dam even higher than the proposed hydraulic-fill dam, that could be used for a diversion dam for the Arizona Highline Canal.

This use of the Boulder dam for a diversion dam for the Arizona Highline Canal would of course be bitterly opposed by the Mexican interests. If the Boulder dam were raised 300 feet by a hydraulic-fill extension above the present structure but resting immediately against the concrete structure now built, 1700 feet of pump-lift could be saved for California.

If the way is made easy to get water to Southern California they would want more water in California and just that much less would be left for Mexico. The most casual reader will have no trouble to grasp that point. The success of the Mexican scheme was enhanced by making it as costly as possible to get water from the Colorado river to California.

The San Francisco earthquake, the Santa Barbara earthquake, and the Long Beach earthquake seem to have made no impression on the promoters of the Boulder dam project.

**The Helena, Montana, Earthquake is another warning!**

The easiest and cheapest way to get the largest possible modicum of safety is to use the present Boulder dam merely for a surplus storage and flood control dam, rarely filling it to full capacity. The necessity for an Emergency dam below all other dams on the Colorado river was strongly urged by LaRue in his famous report on the Colorado river. The Boulder dam should be so used unless some greater measure of safety can be had in some other way. Then the Bridge canyon diversion dam and the Glen canyon storage dam would

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complete the system of three great dams recommended in La-Rue's Colorado river report, Water Supply Paper 556.

Whatever other use may be made of it, it is of the most vital importance that neither the Boulder dam nor the Parker-Gila dam should ever be used to develop hydro-electric power. The whole scheme to get the water into Mexico by the law of gravity, because it can be secured under no other law, revolves around the project to develop power for Los Angeles at the Boulder Dam and the Parker-Gila dam. Of course that necessitates dropping the water to the bed of the river at the base of the dam. From there it flows by gravity to Mexico unless pumped back to some impracticable height.

The total area in Arizona irrigable without pumping below the Boulder dam in Arizona is only about 280,000 acres. Were it not for the Mexican scheme the idea of pumping water over Shaver's Summit when it could just as well have been delivered from the Bridge Canyon dam by gravity would be regarded as a joke. As it is now, few of the people in Los Angeles know that the water is to be pumped 1500 or 2000 feet. Most of the people think it is to be diverted by the Parker-Gila dam and run thence by gravity to Los Angeles.

The issue now pending for decision by the people of the United States of America is whether 15,000,000 acres of land in Arizona shall remain a desert forever, thus blighting the future of a Sovereign State of the Union, in order that 2,000,000 acres may be reclaimed in Mexico as the inevitable result of power development at Boulder dam and Parker-Gila dam, when more power can be developed at Bridge Canyon dam, from which the water would flow to Los Angeles by gravity, thus saving 250,000 horsepower now proposed to be perpetually used to pump that water 1700 feet over Shaver's Summit, and also saving Arizona's rights in and to the waters of the Colorado river.