In the Supreme Court

OF THE

United States

OCTOBER TERM, 1960

No. 8, 9 Original

STATE OF ARIZONA, *Complainant,*

vs.

STATE OF CALIFORNIA, PALO VERDE IRRIGATION DISTRICT, IMPERIAL IRRIGATION DISTRICT, COACHELLA VALLEY COUNTY WATER DISTRICT, METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA, CITY OF LOS ANGELES, CALIFORNIA, CITY OF SAN DIEGO, CALIFORNIA, AND COUNTY OF SAN DIEGO, CALIFORNIA, *Defendants,*

UNITED STATES OF AMERICA, *Intervener,*

STATE OF NEVADA, *Intervener,*

STATE OF NEW MEXICO, *Impleaded,*

STATE OF UTAH, *Impleaded.*

OPENING BRIEF FOR THE STATE OF NEVADA, Intervener

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May 15, 1961

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SUBJECT INDEX

TABLE OF CASES

CONSTITUTION

FEDERAL STATUTES

STATE STATUTES

MISCELLANEOUS

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JURISDICTION

This is an action between States in which leave to file the Bill of Complaint was granted January 19, 1953 (344 U.S. 919). The State of Nevada was granted leave to intervene June 1, 1954 (347 U.S. 985). Original jurisdiction exists under Article III, Sec. 2, of the Constitution of the United States.

STATEMENT OF THE CASE

This case is now before this Court on Exceptions by all parties (except the State of Utah) to the Report of Simon H. Rifkind, the Special Master who conducted extensive hearings as outlined at pages 2 and 3 of his Report. He recommended that a decree be entered allocating and controlling the waters in the manner set out in Part Three of his Report (pages 345–360). This recommended decree is based upon the findings and conclusions contained in the other portions of his Report.

This voluminous Report contains a complete and accurate statement of the complex history and factual situation involved in this action, as well as a summary of the evidence introduced at the lengthy hearing. It seems to the State of Nevada unnecessary to repeat the same material in this Brief.

Arizona instituted this action against the State of California, and certain entities in that State who were using Colorado River water (commonly called the California defendants) pursuant to the order of this Court dated January 19, 1953 (344 U.S. 919). Simultaneously, the United States was granted leave to intervene. Subsequently, on June 1, 1954, Nevada was granted leave to intervene (347 U.S. 985) and thereafter, on December 12, 1955, order was entered joining Utah and New Mexico as parties only to the extent of their interest in Lower Basin waters (350 U.S. 114).

The pleadings in the action are listed in detail in Appendix I to the Special Master's Report (pages 363–370) and are summarized briefly in pages 2 and 3 of his Report. The issues, as they appeared to the Special Master as ultimately submitted, are listed on pages 4–6 of the Report.

In its Petition in Intervention herein, Nevada asserted that it was one of the Lower Basin States, as defined in the Colorado

River Compact (hereinafter referred to as "the Compact"),[1] that it was entitled to protection of all of its existing rights in the Colorado River system, including both diversions from the mainstream and from the tributaries flowing through Nevada (the Virgin and Muddy Rivers and Meadow Valley Wash), and that it was entitled to a fair and equitable portion of the waters of the Colorado River Basin, out of all waters available to the Lower Basin. Attached hereto as Appendix IV, page 113, is a map showing the portion of Nevada which is within the Colorado River drainage area.

The fundamental problem in this matter is the allocation of the mainstream water of the Colorado River among the three Lower Basin States, Arizona, California and Nevada. Lying in an arid region, this water is literally the life blood of an area which is now undergoing a population explosion and industrial expansion, probably without parallel in history. As each year passes, the vital necessity of a known water supply becomes increasingly apparent to everyone responsibly connected with this area.

In the Special Master's Report, he has capably described the geography of the Colorado River Basin (pages 9–14); the history of the Colorado River (pages 15–31); he has listed (pages 7–8) the four prior instances in which some phases of this matter have been presented to this Court in actions between Arizona and the other States.

In brief, the Special Master determined: That if there is sufficient mainstream water in the Colorado River to satisfy 7,500,000 acre feet of annual consumptive uses in the Lower Basin States, it should be apportioned: 2,800,000 acre feet to Arizona; 4,400,000 acre feet to California and 300,000 acre feet to Nevada. That any water available in excess of 7,500,000

[1]Appendix 2, Report, pp. 371–377.

acre feet should go 50 percent to Arizona and 50 percent to California (unless the United States contracts with Nevada, and then it would be 4 percent to Nevada and 46 percent to Arizona). That whenever the water supply is less than 7,500,000 acre feet of consumptive use, it is to be divided fractionally:

$\frac{2.8}{7.5}$ for Arizona $\frac{4.4}{7.5}$ for California $\frac{.3}{7.5}$ for Nevada

And he further determined that rights presently perfected on June 25, 1929, should be filled in order of priority, even though it requires contributions from the water apportioned to other States. All of the foregoing allocations are from mainstream water at and below Lake Mead; and he did not find it necessary to make any determinations as to tributary uses except those applying to the rights of New Mexico and Arizona on the Gila River System.

His Report provided that the Secretary of the Interior should make all determinations relative to available water supply and be in sole control of the operation and management of the reservoirs and the lower river.

The basic law involved in the determination of this action depends upon interpretation of the Colorado River Compact, the Boulder Canyon Project Act[2] (hereinafter referred to as the "Project Act"), the California Limitation Act[3] (hereinafter referred to as the "Limitation Act"), and the Mexican Treaty.[4] All of these are thoroughly described and analyzed by the Special Master in his Report.

The fundamental physical situation is one resulting from the

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[2]45 Stat. 1057; 43 U.S.C. 617.

[3]Act of March 4, 1929; ch. 16, 48 Session; Statutes and Amendments to the Codes, 1929, pp. 38–39.

[4]Treaty between the United States and Mexico, dated February 3, 1944 (59 Stat. 1219).

great complex of dams, reservoirs and diversion works, beginning with the Hoover Dam and extending downstream to the Mexican Border. This vast array of projects has been built at the cost of hundreds of millions of dollars by the United States of America (except only the Colorado River Aqueduct which was built by Metropolitan Water District of Southern California) (Report, pages 38–39). The Report describes these mainstream works at pages 32–38, and the Gila System works at pages 39–43.

At the hearing, Nevada's proof established that the gross diversion requirements for use in Southern Nevada by the year 2000 would be 786,000 acre feet from the Colorado River and its tributaries in Nevada, resulting in a total net consumptive use of 530,000 acre feet. Of this amount, there would be a net consumptive use requirement of 431,600 acre feet from Lake Mead.

Because of the voluminous record herein, Nevada has, for the convenience of the Court, compiled and is attaching hereto as Appendix I, pp. 63–105, a document entitled "Present and Future Water Requirements for Colorado River Basin in Nevada" which covers in considerable detail the present and future water requirements for irrigation, industrial, municipal, and domestic purposes in Southern Nevada, which is fully documented by the record.

Generally, the posture of this case at this time, according to the Exceptions that have been filed by the parties is this: Arizona, the United States and Nevada all accept the Special Master's recommended decree, with only minor exceptions thereto. Nevada's Exceptions might properly be described as perfecting exceptions. California, on the other hand, disagrees with the ultimate decision of the Master *in toto*. So that on this main issue, we have the parties aligned, California on the one hand, the other parties in opposition.

However, there are two specific issues between Nevada and the United States. The Special Master found in his Report at pages 237–247 that Article 5(a) of the Nevada Contract[5] with the United States of America (and a similar Article 8(d) in the Arizona-United States contract)[6] providing that water used by Nevada users above Lake Mead should be deducted from her contract allocation was invalid and void. Nevada (and Arizona) agree with the Special Master's decision on this point. However, the United States disagrees.

Likewise, Nevada contends, and the Special Master found in his Report (page 210), that the contract between the United States and the Colorado River Commission of Nevada, a statutory body of the State of Nevada, does not require additional subcontracts between water users and the Secretary of the Interior. The United States disagrees.

Again, any more detailed statement of the facts and issues in this case would be merely repetition of the Special Master's excellent presentation thereof.

PATTERN OF THE BRIEF

Because of the extent and complexity of the record, issues and exceptions of the various parties in this case, it does not seem to Nevada that it would be helpful in her opening Brief to attempt to discuss at length every one of the multiple questions involved. Accordingly, in this Brief, she will present the argument in general support of her basic position in the matter. And will point out in detail the reasons for her perfecting exceptions to the Special Master's recommended decree.

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[5]Appendices 6 and 7, Report, pp. 409–422.

[6]Appendix 5, Report, pp. 399–407.

This brief does not contain specific opposition to the exceptions filed by the other parties. It is, as noted, a general statement of Nevada's position in support of the Special Master's Report and an argument in support of Nevada's perfecting exceptions thereto.

Nevada respectfully reserves for its second, or Answering Brief, the right to specifically oppose the exceptions of other parties on matters adverse to her. No proper or full opposition to such exceptions can be made at this time, prior to being advised as to the arguments made in their behalf. To divide such opposition partly in this brief and partly in an answering brief would, Nevada believes, tend toward confusion rather than clarification.

SPECIFICATION OF EXCEPTIONS TO BE URGED

The State of Nevada will urge Exceptions I, II, III and IV. Argument in support of these exceptions is contained in Point V of this brief. These exceptions, in summary, are:

I. The Special Master erred in providing in the proposed decree that "mainstream water shall be delivered to users * * * in Nevada only if contracts have been made by the Secretary of the Interior, pursuant to Section 5 of the Boulder Canyon Project Act for delivery of such water."

II. The Special Master erred in finding in his Report and in the proposed decree that a part of Nevada's allocation of water may be used to supply the so-called "present perfected rights" in other States in years when the allocations of such other States are not sufficient to supply said rights, and, as an alternative, the Special Master erred in not providing a minimum figure below which the allocation of the State of Nevada could not be reduced, if, and when, it

ever becomes necessary to take water away from Nevada's allocation for supplying so-called "present perfected rights" in other States.

III. The Special Master erred in failing to recommend in his Report, or provide in his proposed decree, for the appointment by this Court of a Commissioner with power to supervise the operation of the Colorado River in the Lower Basin and the delivery of water to the several contractors.

IV. The Special Master erred in failing to recommend in his Report or include in his proposed decree, a provision for the promulgation of Rules and Regulations by the Officer in charge of operating the Colorado River after the decree is entered herein.

Point V in Nevada's Exceptions is not strictly an exception. Nevada reserves the right, if it appears during the subsequent proceedings herein, to again urge the legal contentions made by Nevada which were not adopted by the Special Master. By not excepting to the basic theory adopted by the Special Master, Nevada is not waiving the right to assert that she is entitled to the quantity of water awarded her by the Special Master, if not a larger quantity, under the theory urged by Nevada in her pleadings, proof and prior briefs herein or under any other theory or plan of distribution. This is developed in more detail in Points I, III and IV of this Brief.

SUMMARY OF ARGUMENT

I.

Since Nevada is one of the three sovereign States in the Lower Basin of the Colorado River, she believed that it was necessary, if her rights therein were to be adequately protected, to intervene in this action. As one of these three sovereign States, Nevada

stands on a par so far as the quality of her legal rights are concerned with the other two States of the Lower Basin. The quantities of water claimed by the complainant and defendants, if fully allowed, would deprive Nevada of her equitable share.

While the total of Nevada's claim is smaller than that of the other two States, Nevada's need for this claimed water is far more urgent. For she is unique in that the portion of her area lying within the drainage area of the Colorado River, has no other source of water. On the other hand, each of the other States has alternative sources.

As is true in all lengthy hearings, we find in this case, and especially after the Special Master's Report, that the issues have greatly sharpened. The basic one now is as to the proper one theory for allocating the mainstream water among the three Lower Basin States. It is Nevada's position that, as a sovereign State, she has a basic minimum right which entitles her to at least the amount of water awarded in the Special Master's Report, under whatever legal theory may be used.

While the Report awards Nevada a smaller amount of water than her proof indicates that she would be entitled to, Nevada has not excepted to this because it seems equitable under all the circumstances. Nevada has filed exceptions to some of the more or less ancillary or subsidiary conclusions of the Special Master. In not excepting to the basic award, Nevada emphatically asserts that she is not waiving the right to urge an allocation to her in at least the amount now recommended if the Court should determine that this case should be decided on any other or different theory than that followed by the Special Master.

II.

The 300,000 acre feet of the Colorado River mainstream water allocated to Nevada by the Special Master's Report is the bare

minimum which will be required for existing and future uses. In fact, it will not be sufficient to provide for her growth and development as far in the future as the year 2000. It is conservatively estimated that by that time, Southern Nevada will require a beneficial consumptive use of 431,600 acre feet of water from Lake Mead, more than 35 percent of the amount allotted by the Special Master.

The portion of the affected region included within Clark County, which area encompasses the City of Las Vegas, the principal metropolitan center, has had a fantastic growth. With a population of only 3,031 in 1910, Clark County jumped to 16,414 in 1940, and then an explosive increase to 115,000 in 1956, and to 127,016 in 1960. The rate of population growth in Nevada in the last seven years is greater than that of any other State. Clark County has shown a greater rate of increase than Nevada, Arizona, New Mexico or California; having increased almost 35 times since 1910. Compared with areas of similar climate, such as Los Angeles, Phoenix and Albuquerque, it has shown a greater growth. It is a sound and reasonable forecast that this population will increase to at least 600,000 people by the year 2000.

There are present in the area all of the factors making for sound growth. Large industrial developments, which are the outgrowth of great plants built by the United States during World War II, are located in that area, and are continuing to expand. These industries derive adequate water supplies from Lake Mead and low-cost electric power from the Hoover Dam installation. There is available for future industrial growth these factors of adequate water supply, low cost electric power, natural gas, and an attractive climate which reduces construction costs. The area is well supplied with all types of transportation, both railroad, air and adequate highways. There is ample room for attractive

homesite tracts which fit into the currently popular trend toward desert living. With both nearby mountains and the large man-made lakes on the Colorado River, the area is supreme in its recreational and entertainment facilities, and attracts thousands of tourists annually.

As a result of all these factors, it is very evident that by the year 2000, the net consumptive use requirements from Lake Mead (diversions less return flows) for the affected Nevada area will be:

Domestic uses	305,700 acre feet
Industrial uses	97,000 acre feet
Irrigation uses	28,900 acre feet
Total	431,600 acre feet

Nevada is unique in not having any available source of water other than mainstream Colorado River water. On the other hand, both the States of Arizona and California are cooperating with the United States in the current rapidly progressing development of methods of converting salt or brackish waters into water of useable quality at a low economic cost. Arizona has large amounts of this type of water which will be capable of reconversion, as does also California, including limitless quantities of available sea water. Also, California has a great surplus of water in the northern part of the State, the transportation of which to the southern part of the State has been authorized by its Legislature, approved by the voters of the State and the initial steps of which are now in progress.

All of the foregoing, in Nevada's opinion, are factors to be taken into account in allocating the waters of the mainstream among the three affected sovereign States. To Nevada, this water is indispensable.

III.

The Special Master found the Project Act and the Limitation Act to be the sole controlling statutes in allocating mainstream Colorado River water among the three States. It is Nevada's position that the Compact, the Project Act, the Limitation Act, and the general Reclamation Law[7] must all be considered together as an integrated and interwoven body of law. Together they comprise a single "bundle" or "package" from which the rights of the parties in this action must be determined.

By Articles III(a) and III(b) of the Compact, there was an apportionment of beneficial consumptive use of water of the entire Colorado River System in the amount of 7,500,000 acre feet to the Upper Basin and 8,500,000 acre feet to the Lower Basin. By Article III(d) of the Compact, the Lower Basin must, in every 10-year period, permit 75,000,000 acre feet to pass Lee Ferry and into the Lower Basin. The Compact additionally makes provision for supplying the water granted to Mexico by the Mexican Treaty.

It does not allocate specific amounts of water to the separate Lower Basin States, either in exact quantities or percentages of flow or in any manner, and it is inevitably true that in the Lower Colorado River Basin, which is in the midst of one of the greatest population explosions in history, that there must be an allocation of mainstream water among the three Lower Basin States.

In the Project Act, Congress provided as a condition precedent for it becoming effective (in the event all seven States did not ratify the Compact—and they did not), that California should by appropriate legislation limit its demands for water from the Colorado River.

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[7]Act of Congress, approved June 17, 1902 (32 Stat. 388, 43 U.S.C. 1311), and acts amendatory thereof or supplementary thereto.

For very real and cogent reasons, California promptly passed the Limitation Act, limiting her right to use of Colorado River water to 4,400,000 acre feet of the total Compact apportionment of the 7,500,000 acre feet made by Article III(a) of that document, and one-half of any excess or surplus.

The Special Master has defined the additional 1,000,000 acre feet of water apportioned to the Lower Basin by Article III(b) of the Compact as excess or surplus water. In Nevada's opinion, there is much reason to believe that this so-called III(b) water is not excess or surplus, but water apportioned by the Compact. In any event, the allocation to California recommended in the Special Master's Report is generous to California's claim and that State is in no position to complain. By reason of her Limitation Act, she cannot claim more water than as awarded in the Special Master's Report.

The Special Master interprets Section 4(a) of the Project Act as being a precise, definite and conclusive direction by the Congress to the Secretary of the Interior to allocate the mainstream water among the three States by contracts. He holds that the contracts which have been made by the Secretary with Nevada awarding her 300,000 acre feet of water; with the State of Arizona, awarding her 2,800,000 acre feet of water; and with California, awarding her 4,400,000 acre feet of water all out of the first 7,500,000 acre feet available in the mainstream, are dictated by and are in accordance with this statutory allocation.

There is no question that the United States had the right to construct and operate Hoover Dam and to create the resulting storage behind it for irrigation purposes, either under the General Welfare Clause of the Constitution (Art. I, Sec. 8), *United States* v. *Gerlach Livestock Co.*, 339 U.S. 725, 738 (1950) or, conceding the navigability of the Colorado River, under the Commerce Clause (Art. I, Sec. 8). *United States* v. *Twin City Power*

Co., 350 U.S. 222 (1955); *United States* v. *Chandler Dunbar Co.*, 229 U.S. 53 (1912); *United States* v. *Appalachian Power Co.*, 311 U.S. 377, 426 (1940), and to control and dispose of such stored waters. *Ivanhoe Irrigation District* v. *McCracken*, 357 U.S. 275, 295 (1958).

It follows that with the construction of Hoover Dam in the Colorado River and the resultant complete control of all the water reaching the impoundment of Lake Mead, that the United States would be in control of the waters of that stream and that the waters thereafter used would be such stored waters.

Regardless of the specific language of Section 5 of the Project Act requiring the Secretary of the Interior to make contracts for the delivery of stored water, the Secretary had the basic right and obligation under the general Reclamation Law, to make contracts for the delivery of stored water. Obviously such contracts would be necessary to avoid utter chaos.

There was nothing in any existing law which provided that such contracts should be limited only to projects then in being. On the other hand, the underlying basic rights of the sovereign States would indicate the necessity of protecting the rights of the more slowly developing uses in Arizona and in Nevada as against the then great uses being insisted upon by California, which had progressed more rapidly in her development. There was no abuse of discretion on the part of the Secretary in making the contracts as he did.

By the time this action had been commenced, the Federal Government by a series of dams financed, constructed and operated by it, had taken physical control of the Colorado River from Lake Mead to the Mexican border, and of all waters stored in or flowing through that stretch of the river. By reason of this legal and factual situation, it is perfectly proper at this time to find that the contracts made by the Secretary are valid. In the

case of the State of Nevada, its contract for 300,000 acre feet of consumptive use of mainstream water is a valid, binding and controlling document; with the single exception that Article 5(a), which purports to diminish this total amount by Nevada's upstream tributary uses is, as the Special Master finds, invalid. This paragraph was wrongfully inserted in the contract, is contrary to the terms of the Project Act, and is *ultra vires*.

The Secretary's contracts, when interpreted in the light of the Compact, the Project Act, the Limitation Act and the general Reclamation Law, allocate the mainstream waters among the three States in the precise amounts which the legislative history of the Project Act clearly shows that the Senators from the affected States believed were being allocated to those States.

The basic allocation of mainstream water evidenced by these contracts should be upheld, whatever interpretation is made of the literal language of the Project Act.

IV.

The division of mainstream water proposed in the Special Master's decree is a fair and just allocation. It can be upheld under either the theory of statutory allocation adopted by the Special Master, or that of a judicial equitable apportionment of these waters.

During the hearing, the United States and Arizona relied on a contract allocation authorized by the Project Act, a theory substantially similar to that followed by the Special Master. California has always urged what she describes as an equitable apportionment theory, but in reality, restricts it to a mere judicial confirmation of existing rights. While Nevada asked for a true judicial equitable apportionment which would give effect to her future needs.

Nevada is willing to accept the allocation of mainstream water as made by the Special Master, even though it is less than the total amount revealed by her evidence as being needed by the year 2000. In her opinion, the award to her of the 300,000 acre feet of consumptive use, in accordance with her contract with the United States can be sustained on any one of several theories. It can be sustained under the theory of statutory allocation adopted by the Special Master. If we were to assume that there were no Project Act and that Hoover Dam had been built under the general Reclamation Law, and that the Secretary had made a similar contract, that contract could, in that situation have been upheld in an action such as this. Or, if we consider this action as one for a judicial equitable apportionment, it is proper to use the contracts made by the Secretary, such as that with Nevada, as a yardstick, and as evidence of a water right which could and should be sustained in any such decree.

The voluminous record in this case justifies the use of the judicial power in dividing this urgently needed water among the three States. While the Special Master stated that he followed the statutory allocation made by Section 4(a) of the Project Act in his basic division, he definitely recommends the use of judicial authority in providing that in years when there is less than a total of 7,500,000 acre feet of mainstream water available for consumptive use, that the allotments to the States should be reduced so that they take on a pro-rata share. And he further recommends the use of judicial authority in his provisions for protecting prior perfected rights, regardless of state lines, in years of extreme drouth. Nevada believes all of these basic features of the proposed decree are logical and proper.

V.

Nevada has filed only four exceptions to the Special Master's Report and Recommended Decree, all of which are more or less of a perfecting nature.

Exception Number I requests apt language in the final decree herein to make it clear that in Nevada, the basic contract with the State acting through the Colorado River Commission of Nevada is sufficient and that additional sub-contracts between the Secretary and the actual users are not necessary. The Special Master points out in his Report (page 210) that the Nevada contract, different from that of Arizona, does not require such sub-contracts. The Nevada Commission is an active operating body controlling the diversion and delivery of water diverted from Lake Mead and making the payments therefor. The actual uses are, and will be, domestic and industrial in the main. There will be a multitude of users and to attempt sub-contracts for all would result in chaos and confusion.

Exception Number II requests that the provisions of the recommended decree be amended to provide that no part of Nevada's allocation of water be used to supply so-called "present perfected rights" in Arizona and California in years when the allocations of such States are not sufficient to supply such rights, or in the alternative, Nevada asks that a minimum figure (she suggests 250,000 acre feet) be fixed below which Nevada's allocations should not be reduced to make contributions to others. This is necessary because the principal uses in Nevada will be domestic uses and industrial uses in the nature of the sustenance of life and the continuation of business. They are not of the nature that can be temporarily suspended in years of short supply. Nor does Nevada have any large quantity of perfected rights on the mainstream. On the other hand, the other two States, each of whom have large quantities of perfected rights, use the major

portion of their water for irrigation use, a type of use which can be reduced or even suspended in short water years. A minimum on Nevada's rights is very vital to her and because of her small share of the mainstream water would have minimal detrimental effect on the other two States.

Exception Number III requests that the Court appoint a Commissioner with power to supervise the operation of the Colorado River in the Lower Basin and to control the delivery of the waters thereof. The Special Master recommends that these duties be imposed on the Secretary of the Interior. Nevada believes that it is more just and equitable to have such an independent Commissioner, subject to the control of this Court. The Secretary of the Interior operates in many capacities and there is much chance of a conflict of interest between the proprietary water demands of many of the agencies under him and those of other water users. The Special Master's suggestion, in effect, would constitute the Secretary the owner, the attorney, the judge and the jury with respect to the Colorado River water. This would not seem to be a desirable situation.

Exception Number IV requests that the decree provide that whatever official is given the management and control of the lower Colorado River be required to promulgate Rules and Regulations setting forth in detail the manner, method and plan that will be followed in operating the river in determining annual allocations and scheduling deliveries. Absent a set of Rules and Regulations such as this, the various water users would be left in constant uncertainty and there would be an invitation to unnecessary controversy. On the other hand, with all parties knowing in advance the Rules and Regulations under which the river is to be operated, the possibility of friction would be removed and intelligent advanced planning could be had by the various water using agencies.

ARGUMENT

I.

BASIC POSITION OF THE STATE OF NEVADA

Nevada occupies a unique position in this action. In a sense, it is being compelled to prematurely press for definition and protection of its Colorado River water rights which she will ultimately desperately need.

As one of the three Lower Basin States, she is, of course, vitally concerned in the allocation of the waters of that stream. That portion of Southern Nevada lying in the Colorado River Basin has no other source for additional water.

Accordingly, after the instant suit was filed and the United States requested and was granted the right to intervene, it was apparent that there would inevitably be a determination of the rights of the Lower Basin States in the waters of the Colorado River. In that situation, Nevada believed it necessary to protect its rights by requesting permission to intervene herein, and was granted that right. Nevada was not then, and is not even now being deprived of water presently needed. But it was very apparent then, and is absolutely definite now, that in the immediate future, as the history of states and nations are measured, Nevada will require substantial amounts of water from the Colorado River if her normal growth and development are to continue.[8]

The tremendous quantities of water being requested by Arizona and California would, if allowed, consume all of the water available in the mainstream in the Lower Basin. If their claims were granted in a suit to which she was not a party without protection of Nevada's rights, she would at best have been put to the tremendous and expensive task of bringing subsequent litigation in

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[8]Appendix I, pp. 77–105.

this Court to assert her rights and perhaps be then confronted with the additional overwhelming burden of attempting to acquire rights to the use of water after it already had been used as the basis of economic growth in other States. This is the basic reason that Nevada is requesting the delineation of its rights in the mainstream Colorado water in the decree herein.

As one of the three sovereign States comprising the Lower Basin of the Colorado River System as defined in the Compact, Nevada stands on a par, so far as legal rights are concerned, with the Complainant Arizona and the Defendant California.

True, the amount of water required by Nevada is substantially smaller than that sought by the other two States. But this fact does not render the outcome of this case less important to the Intervener, Nevada. On the contrary, it is more important. For Nevada is unique in that she has no other conceivable source of additional water in that portion of the State lying within the Colorado River Basin, other than by taking it from the Colorado River. The same is not true with respect to either Arizona or California. The former has immense possibilities of additional water supply by the reconversion of presently unuseable waters. And the latter not only has available, but is in the process of transporting to the southern part of the State tremendous quantities of waters from the surplus regions in northern California. In addition, it has limitless quantities of sea water along the coastal regions available for conversion.[9] Nevada has no region with surplus waters from which it can transport waters to the South. It does not have even presently unuseable water which can be reconverted.

At the outset, we should comment that, as is generally true in nearly all lengthy hearings, much of the evidentiary matter

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[9]*Infra*, pp. 32–34.

upon which months of time was spent and which fills thousands of pages of transcript, has lost its meaning and significance now. This, because of the fact that the parties have come to substantial agreement on some points and have realized the irrelevancy of other matters. This simplification and re-defining of issues is even more apparent with the filing of the Special Master's Report.

It is Nevada's basic premise that whatever legal theory or theories that may be followed in allocating Colorado River waters among the Lower Basin States, that there is a basic minimum right on the part of Nevada, as a sovereign State, to eventually use water at least in the amount allocated to her by the Master's Report herein. Or, to put it another way, that whatever legal theory is followed, it would be necessary that Nevada be given the right to use up to the amount of the quantity of water specified in the Master's Report.

The amount of water awarded to Nevada in the Special Master's Report is less than that shown to be required in the reasonably near future by Nevada's proof. However, since the award appears to be equitable under all the circumstances, Nevada has not taken exception to the basic conclusions of law found by the Special Master and by which he disposed of this action. It has only filed exceptions as to certain more or less ancillary or subsidiary conclusions found by him.

In not thus excepting to the Special Master's Report, Nevada desires to make it precisely clear here, that she is not waiving the right to urge an allocation to her of an amount of water at least equal to the award made by the Special Master in the event it is decided that a different theory of law shall prevail from that adopted by the Special Master. For instance, that no less than this amount should be awarded her if it were determined that the case should be decided on the theory of equitable apportionment.

II.

EXISTING AND FUTURE WATER REQUIREMENTS FOR SOUTHERN NEVADA FROM LAKE MEAD

The Special Master's allocation of 300,000 acre feet to the State of Nevada from Lake Mead for consumptive use in Nevada is the bare minimum of the amount of water which will be required for existing and future uses. It is conservatively estimated that the net consumptive use requirements from Lake Mead for Clark County by the year 2000 for domestic, municipal and irrigation uses will be 431,600 acre feet, an increase of more than 35 percent of the amount allowed by the Special Master. This is fully supported by the record.[10]

The City of Las Vegas is the principal residential area and trading center in Southern Nevada. Las Vegas and Las Vegas Valley is entirely in Clark County. The growth of the Las Vegas area during the past 25 years has been phenomenal. Las Vegas has grown from virtually nothing in 1905 to its present state of development. The population census in 1910 showed a population of 800 in Las Vegas and 3,031 for Clark County. The 1930 census showed 5,365 in Las Vegas and 8,632 in Clark County. The construction of Hoover Dam which commenced in 1930 accelerated its growth. In 1940 the population of Las Vegas was 8,422, Boulder City 2,600, and Clark County 16,414.

The accelerated growth commenced with World War II and has continued since. The Basic Magnesium Project was commenced in 1941. Following the close of World War II Basic Magnesium, Inc., was acquired by Basic Management, Inc., comprised of the Stauffer Chemical Company, American Potash & Chemical Company, Combined Metals Production Corporation, Titanium Metal Corporation and United States Lime Production Corporation, which companies have contributed materially

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[10]Appendix I, pp. 80–105.

to the growth not only of the City of Henderson, but also of the Las Vegas area.[11]

Nellis Air Force Base was constructed during the War and has increased in size since that time and is now the largest jet aircraft training center in the country. Near this base the Navy has constructed the large Lake Mead Naval Ammunition Depot. Also, the proving grounds of the Atomic Energy Commission, "Frenchman Flats," is located about 60 miles northwest of Las Vegas. These factors have caused an explosion in population growth. The population of Las Vegas increased from 8,422 in 1940 to 53,000 in 1956, and in Clark County from 16,414 to 115,000 during the same period.[12] The population of Clark County in 1960 was 127,016.[13]

There are a number of factors which have contributed to the phenomenal growth of the Las Vegas area. Important factors were the construction of Hoover Dam with the resulting cheap power and water. Electric power made possible the development of the major industries at Henderson and additional power is available through the thermal generating stations. Another factor is the extensive government installations to which reference has

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[11]These industries were all in production in 1958. The Stauffer Chemical Company is producing chlorine and caustic soda. The American Potash & Chemical Company and Western Electrochemical Company produce perchlorates and electromatic manganese. They are the largest producers of ammonium perchlorates in the United States used in the missile program. The Titanium Metal Corporation is the largest producer of titanium. This product is also used in the missile industry and related fields. The United States Lime Production Corporation calcines lime for steel and agricultural industries and hydrates lime for construction industries. Appendix I, pp. 81–83.

[12]Appendix I, pp. 73–76.

[13]General Population Characteristics, Final Report PC(1) 30B of U. S. Department of Commerce.

been made. Other factors are the tourist travel and recreational facilities. Las Vegas has become the greatest live entertainment center in the country, and thousands of tourists are attracted there annually. Finally, since World War II, there has been a trend toward desert living. Air conditioning has made desert living attractive and comfortable, and there are a number of large cities with similar climatic factors which have grown rapidly, including Tucson, Phoenix, and Palm Springs, California.[14]

It is, of course, a matter of common knowledge that the industrial growth in the Las Vegas area has been phenomenal since the beginning of World War II, and is continuing at an accelerated pace. In addition to the Basic Management, Inc., industries, to which reference has been made, other major industries in the area are Manganese, Inc., which mines manganese for the steel industry, and Pabco, Inc., which mines and processes gypsum. The sole source of water for these industries is Lake Mead and all of these industries are expanding users of waters from Lake Mead.[15]

There is every indication that the Las Vegas area will experience a tremendous industrial growth in the next 40 years. There are a number of factors which lead to this conclusion. The availability of power and water which attracted the existing industries will continue to attract other industries. Southern Nevada enjoys the same climate and natural attractions which have led to large industrial growth in other cities such as Phoenix and Tucson. The climate has a direct effect on construction costs, lost time due to inclement weather, and production of products which are sensitive to humidity. Another factor is the availability of land. Large areas of land can be acquired at nominal cost and yet have all the requirements for basic industries. The accessibility of ores and

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[14]Appendix I, pp. 80–81.
[15]Appendix I, pp. 81–84.

minerals also will have an important effect on the industrial growth of southern Nevada. Transportation services both by land and air are excellent. Adequate utilities are available. Both the electric and gas utilities have completed large expansion programs, and have projected programs for service to take care of future growth. Other factors are that Southern Nevada is attractive to labor supply, and the tax and corporate laws of Nevada are attractive to industries.[16]

A conservative estimate for future water supplies for the present industries by the year 2000 is 90,000 acre feet. Each of these industries have made estimates based upon their present expanding programs. It is conservatively estimated that new industries will require 47,500 acre feet. There also will be required an estimated 37,000 acre feet for thermal power cooling purposes by the year 2000, making a gross diversion requirement of 175,800 acre feet. The estimated return flow would be 78,800 acre feet, making an estimated net consumptive use of 97,000 acre feet.[17]

There are many large areas in the general vicinity of Las Vegas which are ideally situated and suited for industrial sites and small homesites, to which it would be economically feasible to pump waters from Lake Mead. The principal areas are Las Vegas Valley, Eldorado Valley, Apex Dry Lake Valley, California Wash, Mormon Mesa and certain areas in Moapa Valley. Plans for the development of Eldorado Valley are already in an advanced stage.[18]

A sound and reasonable forecast for the population of Clark County by the year 2000 is 600,000.[19]

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[16]Appendix I, pp. 85–87.

[17]Appendix I, pp. 87–89.

[18]These areas are fully described and water requirements discussed in Appendix I, pp. 90–96.

[19]Appendix I, pp. 97–99.

This is a conservative estimate. During the past 97 years while the population of the Continental United States grew about 5½ times, the population of the eight Mountain States increased 36 times and Nevada has increased almost 39 times. Its population has grown 66.6 percent since 1950. Its population in 1950 was 160,000 and its population in 1957 was 267,000. Nevada's rate of growth is steeper than the United States, the Mountain States or the Western States. During the past 7 years it has grown faster than any State in the Union. Its population by the year 2000 is estimated to be 1,300,000. Since 1920 Clark County has shown a steeper rate of increase than Nevada, Arizona, New Mexico or California. It has increased almost 35 times since 1910.

As compared to rapid growing counties with like or similar climate, Clark County has shown a greater rate of increase than Los Angeles, Maricopa (Phoenix), Pima (Tucson), Bernalillo (Albuquerque). The average rate of growth conservatively forecast for Clark County by the year 2000 is slower than the long-term growth experienced by the above named counties. The forecast for the year 2000 represents a maximum of 5.2 times the 1957 population. This is a slower rate of growth than is shown by the other counties between these same population figures of 115,000 and 600,000. While Clark County is expected to grow from one to the other level of that population in the period of 42 years, Los Angeles accomplished it in about 20 years and Maricopa County is expected to accomplish it in about 35 years. Expressing this comparison in still another way, the projection of Clark County population from 1957 to the year 2000 is at an average annual rate of increase of nearly 3.9 percent, while Los Angeles County covered the same range of population growth at an average rate of more than 8.5 percent per year, and Maricopa is expected to achieve it at an average rate of almost 5 percent.

The average annual rate for the Clark County forecast for the

43-year period from 1957 to 2000 is 3.9 percent or approximately half the average annual rate for the 47-year period from 1910 to 1957. In comparable counties in the southwest, the average annual rate of growth in recent years has been from 4.2 percent to 6 percent.

The water requirements of municipal and domestic uses by the year 2000 would be 353,000 acre feet per year. Municipal and domestic uses include all uses other than industrial, water for thermal power cooling, and water for commercial irrigation. The per capita use per day for uses other than industrial uses, including power cooling and commercial irrigation, would be 525 gallons per day. Based on a population of 600,000 by the year 2000 this would require 353,000 acre feet per year. The estimated return flow from the use of the water diverted would be 38,000 acre feet. Therefore, the estimated net use for all domestic and municipal uses would be 315,000 acre feet per year. From this would be subtracted 9,320 acre feet of ground water in Las Vegas Valley, leaving 305,680 acre feet needed from Lake Mead for net consumptive use for domestic and municipal purposes.

Thus, there will be a net consumptive use requirement from Lake Mead for Clark County by the year 2000 for irrigation, domestic, municipal and industrial uses of 431,600 acre feet. In tabular form this can be shown as follows:

From Lake Mead (diversions less returns).	
Domestic uses	305,700 acre feet.
Industrial uses	97,000 acre feet.
Irrigation uses	28,900 acre feet.
Total	431,600 acre feet.[20]

[20]Appendix I, pp. 99–105. Irrigation uses from Lake Mead are described in Appendix I, pp. 71–72, 103–104.

Another factual situation important to and bearing upon the particular issue of equitable apportionment, is the fact that Nevada has no additional source of water available other than from the Colorado River. California and Arizona, on the other hand, have other sources of water to meet their future needs.

The State of Nevada is unique with respect to its complete dependency on the right to the increased use of the waters of the Colorado River for future growth and development of the Nevada portion of the Colorado River Basin. There is no alternative source of water for this particular area. No water is available either for direct use, or for the recharging of underground basins, or for any other purpose other than that of diverting from the Colorado River System.

The situation is different with respect to the other States who are major claimants for waters of the Colorado River System. California, with large surpluses of water in the northern part of the State now going to waste, has taken definitive steps for the development of a plan, the so-called California Water Plan,[21] to bring surplus waters to the water-deficient area in the southern part of the State. The Legislature in 1959 passed the California Water Resources Development Bond Act[22] authorizing the issuance of bonds in the amount of $1,750,000,000 to finance the

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[21]Ariz. Exs. 89 and 89A, Tr. 10,012.

[22]The California Water Development Bond Act, (Cal. Stats. 1959, ch. 1762; Water Code of California, Div. 6, Pt. 6, Ch. 8, Secs. 12930–12942), popularly known as the Burns-Porter Act, was submitted pursuant to Article XVI, Sec. 1 of the California Constitution to, and approved by, a vote of the people on November 8, 1960. This submission was required by Article XVI, Sec. 1 of the California Constitution for the reason that it involved incurring of a debt (bond issuance) in excess of the limitation of $300,000 set forth in the Constitution.

In its principal aspects, the Bond Act is a financing measure intended to make funds available for the construction of water

construction of water facilities, now authorized, including facilities to make water available to Southern California.

Likewise, there are large sources of water available as soon as the rapidly progressing art of de-salting reaches a higher degree of efficiency. The State of California obviously has adequate supplies of sea water along the coastal area, and a large supply in the Salton Sea, and in the drains leading into it from Mexico.

With respect to the State of Arizona, it has the possibility of taking advantage of large amounts of underground storage capacities available in the Phoenix area; and there are also large quantities of saline or brackish water which can be utilized when de-salting reaches the expected stage of economic efficiency.

Implications in saline and brackish water conversion stagger the imagination. Tremendous progress has already been made in the field of low cost conversion.[23] All experts agree that the ultimate goal of truly economic conversion will be reached, and will be reached relatively soon with optimum effort and support.[24]

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facilities. The Bond authorization is in the amount of $1,750,000,000, with a first priority on its use being established to construct designated facilities, among which are those required to make water available to Southern California.

Prior to the enactment of the Bond Act, many of the facilities which are to be financed by that Act were authorized by Act of the Legislature. These, in effect, were reauthorized and more specifically described by the Bond Act, including the facilities to make water available to Southern California.

[23]Report to Select Committee on National Water Resources—U. S. Senate pursuant to S. Res. 48 on Saline Water Conversion. Committee Print No. 26, 86th Cong. 1st. Sess., p. iv-vii. Hearings before Subcommittee on Government Operations. House of Representatives, on Saline Water Program—p. 5, et seq., 85th Cong. 2d Sess.

[24]House Report No. 71, 89th Cong. 1st Sess. March 10, 1961—Staff Report of the Committee on Science and Astronautics—House of Representatives, Research Needs for Salt Water Conversion, p. 9.

The United States has undertaken a comprehensive research program for the conversion of saline water and has expended over $10,000,000 since the program was started in 1953.[25] It has entered into cooperative agreements with both the States of Arizona and California for mutual assistance and exchange of information.[26]

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[25]Congress, to meet the urgent need for further research and development to bring the cost of de-salting within economic range, enacted the Saline Water Act of July 3, 1952 (66 Stat. 328, 42 U.S.C. Secs. 1951 et seq.) which directed the Secretary of the Interior to engage in a 5-year program of research and development for low cost conversion of saline water. To carry out this program the Office of Saline Water was established in the Department of the Interior. Three years later, by the amendatory act of June 29, 1955 (69 Stat. 198), Congress broadened the 1952 legislation to a 14-year program. The amendatory act also increased the total authorization from $2,000,000 to $10,000,000. On September 2, 1958, Congress enacted Public Law 85–883 (72 Stat. 1706) providing for the construction of five demonstration plants to be test operated in a 7-year period, and an additional ten million dollars was authorized to be appropriated for this purpose. One demonstration plant to convert sea water was to be located on the West Coast, and one to treat brackish water was to be located in the arid Southwest. The demonstration plant sites selected in the West are at San Diego, California and Roswell, New Mexico. House Report No. 71, *supra,* pp. 57–107, Thirty-first Report by Committee on Government Operations—Saline Water Program, House Report No. 2551, 85th Cong. 2d. Sess., pp. 3–4. During the short span of 8 years the Office of Saline Control has been in existence, the curve of comparative costs has gone down further and faster than in all previous history. Report of Secretary of the Interior to the President on Saline Water Conversion—1959—p. 3.

[26]House Report No. 71, *supra,* p. 173.

III.

THE SPECIAL MASTER'S RECOMMENDED ALLOCATION OF MAINSTREAM WATER AMONG CALIFORNIA, ARIZONA AND NEVADA SHOULD BE SUSTAINED

It has been the position of the State of Nevada throughout this entire proceedings, and it is her position now, that, as a sovereign State, she is entitled to be protected in her right to the use of waters of the main Colorado River for the sustenance and development of Southern Nevada. While the amount suggested to be decreed by the Report of the Special Master is less than that requested by Nevada as has heretofore been pointed out, it is an amount which will permit continued substantial development of this area. But it is close to the absolute minimum that could have practical value to that section of the State.

The one basic issue now is: Should the division of mainstream water among the three Lower Basin States delineated in the recommended decree be adopted, upon any or all applicable theories of law?

Much argument has been advanced during the hearing and in subsequent briefs and exceptions as to whether the Compact or the Project Act or the Limitation Act is controlling, one against the other, or whether they, or any combination of them, are mutually exclusive in providing the rules for the decision of this case. Even the Special Master's Report follows this general pattern in ruling out some of these pertinent statutes in favor of others.

While Nevada accepts the Special Master's recommendation and agrees with its basic logic and conclusion, it does not appear to her that all of the specific steps in his reasoning are necessary.

In Nevada's opinion, immediately upon, and forever after the time that President Hoover proclaimed that the Project Act was in effect, everyone connected with the administration of the Colorado River has been presented by an intermingled, interrelated

and correlated body of statutory law. Since the Compact was ratified, not in a separate Congressional Act but as an integral part of the Project Act, it seems implicit that the two must always be construed together and are, in effect, one over-all statutory enactment.

Not only are they both so included, but so also is the Limitation Act, the passage of which was by the Congress, made a condition precedent to the effectiveness of the Act ratifying the Compact and authorizing the construction of Hoover Dam and related works. In addition, the general Reclamation Law was incorporated in the enactment to the extent that it was not inconsistent. So there resulted a single "bundle" or "package" of regulatory provisions. We mention this because we think it leads to confusion to say that any one part of this "package" shall control to the exclusion of the others; or, to say that any of the integral parts are irrelevant. For it is necessary to look to and give effect to the provisions of all of them in arriving at a final, logical answer.

A. The Colorado River Compact.

So far as the Compact itself is concerned, it is noteworthy as much for what it did not prescribe as for that which it did prescribe.

It is crystal clear, and now conceded by all the parties to this action, that the Compact did make an apportionment of the amount of water that could be applied to beneficial consumptive use in each the Upper and Lower Basins by the provisions of its Articles III(a) and III(b). By these provisions, the Lower Basin is given the right to consumptively use, out of the entire Colorado River System 8,500,000 acre feet of water, and the Upper Basin the right to use 7,500,000 acre feet of water. This latter being subject, of course, to the possible exception that by Article III(d) in the Compact, the Lower Basin must, in every 10-year period

permit 75 million acre feet of water to pass Lee Ferry for use in the Lower Basin, if that amount is required to permit the Lower Basin users to exercise the full rights granted by the Compact. And also that the Compact provides the method of supplying the amount of water required by the Mexican Treaty to be delivered to Mexico from both portions of the Basin.

The foregoing are self-evident and no one considering the problems of the river can either close his eyes to their meaning and implication or ignore their effect.

There are other things that the Compact does not do. One of the most self-evident of these is that it did not allot water to specific States, in either the Upper Basin or the Lower Basin, either in stated quantities, percentages of flow, or otherwise. Nor did it allot any water to the United States in its proprietary capacity. The controversy as to the amount of water to be allotted to and to be used in specific States, had existed for years prior to the completion of the Compact and in the Lower Basin has continued to rage ever since. Recognizing this gap in the Compact, the Upper Basin States, with the consent and subsequent approval of Congress, agreed on a division of the water alloted to the Upper Basin among the several Upper Basin States. The Lower Basin States have never been able to agree on any phase of this problem. Hence, this litigation.

But it is inescapably true that the orderly development of the area served by the Lower Colorado River System, which is in the midst of one of the greatest population explosions in history, requires that there be an allocation of the mainstream water among the three States. We emphasize mainstream particularly because at the time of the enactment of this legislation, substantially all of the waters of the tributaries in Arizona and Nevada had been already appropriated, and California is devoid of tributaries. So that the *res* of the problem is necessarily the water flowing in the

mainstream, and that the tributary uses, although contained in the Compact definition of the division between the Basins are, as the Special Master logically finds in his Report, of no concern in the decision of this case.

B. The California Limitation Act.

As a condition of the Project Act, including the therein contained approval of the Compact becoming effective, the Congress included the provision that in the absence of ratification by all seven States, California must pass a specifically described Act limiting forever its claim on the water from the Colorado River. We concur in the Special Master's description of this as a condition precedent.

California, for many reasons, had for years prior to the signing of the Compact and the enactment of the Project Act, been the driving force in attempting to secure its enactment. This is very evident from the evidence herein and from the legislative history of the continuing effort through many sessions of Congress to assure the passage of an act similar to the final Project Act.

This was due to many reasons. The great irrigated Imperial Valley was suffering many woes due to the erratic flow of Colorado River. It could never be sure at any time whether it was going to suffer from disastrous floods such as those of the early 1900's that nearly resulted in turning almost the whole thereof into a great inland sea with incalculable destruction, or frequently appearing periods of drouth during which, at times, there was not adequate water for irrigation. In addition to these troubles arising from the uncontrollable forces of nature, the same area was beset with international woes. The only method of transporting Colorado water to this area was through a canal which looped southward into Mexico before re-crossing the International Boundary

in its northward flow to the Imperial Valley. Extreme demands were being made by Mexican land owners as to the amount of water they could divert for their uses from this canal while flowing through their country and obviously no American authorities had any control over this section of the canal or effective means of preventing diversion of water therefor.

Also, it was very evident that the coastal region around Los Angeles was in immediate need of the vast quantities of hydro-electric power which would be provided by Hoover Dam and that the same region would soon require the diversion of Colorado River water for domestic and municipal uses.

All of these reasons were very real and very cogent. California promptly passed the Limitation Act and in the years since, the State of California has reaped rewards of incalculable value as a result of the developments on the Colorado River which she thus made possible.

The subsequent attempts of California to evade the provisions of this Limitation Act or to reduce its effectiveness by proposed technical construction that would render it rather meaningless, come with poor grace from a sovereign State.

As we have noted heretofore, the alignment of the parties in this case has resulted in a situation in which California is taking one position and all of the other parties, while not agreeing among themselves as to all details, are united in supporting the basic decision contained in the decree recommended by the Special Master. California has no standing to in any way attempt to destroy, evade or diminish the limitation placed upon her use of Colorado River water (from the mainstream, which is the only place which she ever has diverted, or could divert) by the Limitation Act.

In Nevada's opinion, the Special Master has been generous to California in his application of the provisions of that Act. In brief,

that Act provided that California was limited to a total of 4,400,-000 acre feet of the water apportioned to the Lower Basin by Article III(a) of the Compact, and one-half of any excess or surplus water. Article III(b) of the Compact apportioned an additional 1,000,000 acre feet of water to the Lower Basin. There is much reason to contend that this additional 1,000,000 acre feet apportioned to the Lower Basin by Article III(b) water is not excess or surplus water, and Nevada so argued in her briefs herein. However, the Special Master has concluded that the portion of the water allotted to the Lower Basin by Article III(b) is excess or surplus water and has awarded one-half thereof to California.

This interpretation of the Limitation Act gives to California the maximum amount of water which it could take from the Colorado River. Certainly that State is in no position to complain as to that part of the Special Master's recommended decree and the limitation on California's diversions prescribed by him should be given effect in any decree that may be entered herein.

C. The Boulder Canyon Project Act.

The basic Act which became effective after the passage of the Limitation Act and which permitted the six-state Compact to become effective was the Project Act. Its basic purpose was to authorize and provide for the construction of Boulder Canyon Dam and the All-American Canal, together with provision for all of the attendant facilities, methods for repayment and management and control of all of the various structures. The portion of the Act dealing with the hydroelectric generation facilities and the sale of the power and energy produced are not in issue here.

The Special Master has determined that because of the provisions of Sections 1 and 6 of the Project Act which list, among the purposes of the legislation that of improving navigation, that

Congress accepted the invitation contained in the last sentence of Article IV(a) of the Compact and disagreed with the statement in that Article that the Colorado River had ceased to be navigable and that the use of waters for navigation should be subservient to other uses.

The Project Act provided for the construction of a dam which would, both because of the terms of the Act and of the inevitable results of its physical capacity impound and control all waters of the main Colorado River reaching that point. By the terms of Section 5, the Secretary of the Interior was particularly instructed to contract for the storage of water in the reservoir and for delivery thereof at various points on the river. And it particularly provided, "And 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."

It was additionally provided in Section 14 that the Act should be supplementary to the general Reclamation Law and that that law should govern the construction, operation and management of the works herein authorized, except as otherwise therein provided. The historical pattern followed under the general Reclamation Law has, of course, been one in which the Secretary has contracted for the delivery of specific quantities of water to the various entities who would be entitled to divert and use them. Without exception, this has been the plan followed on all of the irrigation projects constructed by the Bureau of Reclamation, the greatest builder of dams and irrigation systems throughout the arid Western States.

As to these portions of the Project Act, there has not been and cannot be any particular controversy. The record herein is replete with references to quotations from the legislative history relating to the passage of the Project Act. The Special Master, in turn, quotes at length therefrom in his Report. Arizona and California

attempted to derive contrary conclusions from the legislative history, but it is certainly true that the history unequivocally shows that the Senators from the affected States believed that the Act would result in the ultimate division of the water which would reach Hoover Dam and be stored in the reservoir behind it, among the three Lower Basin States of Arizona, California and Nevada. And in voting upon the complexity of amendments to the portion of the Act which is now Section 4, they unquestionably believed that they were taking effective action on the amount of water which California would have as a prior right and thus guarantee the allocation of the balance available to the other two States. Specific votes were held on these questions.

We do not at this point discuss in detail the thoughtful reasoning of the Special Master wherein he finds that the provisions of this Section constitute a statutory allocation of the mainstream water. There is much reason and logic to sustain the Special Master's position. But in view of the provisions of the Act itself, with reference to the contracting of the water resulting from the construction of Hoover Dam and of the subsequent actions of the Secretary of the Interior, it is Nevada's position that the rights of Arizona and Nevada to receive as sovereign States amounts of mainstream water in the quantities specified in their respective contracts can be sustained on other grounds as well.

Aside from its power under the Commerce Clause of the Constitution, there can be no question now of the right of the United States to construct Hoover Dam and to create the resulting storage behind it for irrigation uses under the General Welfare Clause of the Constitution. *United States* v. *Gerlach Livestock Co.*, 339 U.S. 725, 738 (1950); *Ivanhoe Irrigation District* v. *McCracken*, 357 U.S. 275, 294 (1958). Conceding the navigability of the Colorado River,[27] clearly the United States, under the Commerce Clause, had the right to construct and

operate dams, and control and dispose of the waters of the Colorado River regardless of prior rights. *Arizona* v. *California*, 283 U.S. 423 (1931); *United States* v. *Twin City Power Co.*, 350 U.S. 222 (1955); *United States* v. *Chandler-Dunbar Co.*, 229 U.S. 53 (1912); *United States* v. *Rio Grande Irrigation Co.*, 174 U.S. 890; *United States* v. *Appalachian Power Co.*, 311 U.S. 377, 426 (1940). It follows the United States having expended money to impound the waters and having obtained physical control of it had the right through its properly authorized officers—in this case, the Secretary of the Interior—to specify the quantities of water to be delivered and the conditions for its use. *Ivanhoe Irrigation District* v. *McCracken*, 357 U.S. 275, 295 (1958); *United States* v. *Gerlach Livestock Co.*, 339 U.S. 725. In the *Ivanhoe* case, at page 295, the Court said:

> "Also beyond challenge is the power of the Federal Government to impose reasonable conditions on the use of federal funds, federal property and federal privileges * * *. The Federal Government may establish and impose reasonable conditions relevant to federal interest in the project and to the over-all objectives thereof."

In view of this basic situation, regardless of the specificness of directives to the Secretary of the Interior, contained in Sections 4 and 5 of the Project Act, the Secretary had the basic right and obligation under the general Reclamation Law[28] to make contracts for the disposition of the stored water. In no other

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[27]It was Nevada's position in her briefs before the Special Master that the Colorado River was no longer navigable and the navigation servitude for all practical purposes was mooted. Nevada contended that Congress, in approving the Compact in the Project Act, had consented to Article IV(a) of the Compact which declares that the Colorado River is no longer navigable. The Special Master rejected that contention (Report, p. 151).

way could the highest and best use of the water be attained or the public interests be best served. The only question could be, then, as to whether or not the specific contracts entered into by him are invalid because of any abuse of discretion on his part. No one questions the validity of the contracts made with the various California agencies; although it must at all times be kept in mind that the total to be delivered thereunder cannot exceed the quantity to which California is entitled under its Limitation Act.

And certainly, there was no abuse of discretion on the part of the Secretary in contracting for the delivery of stored water with the respective sovereign States of Arizona and Nevada in the capacity in which he did for the use and development of those States. The legislative history of the attempts to have the Central Arizona Project authorized by the Congress clearly reveals the inescapable necessity of the Congress itself being advised as to the water rights available for a proposed project. There is nothing in the law which restricted the Secretary to make contracts only for projects then in being. In fact, the very essence of water developments in the arid West has been that of first being certain of the availability of water, then the authorizing, financing and construction of the projects. In some instances, this intervening period has been short, but in many instances, of large projects, a considerable number of years have elapsed before the completion of use.

Only after being certain that they would be entitled to specific quantities of water as expressed in their respective contracts could the States of Arizona and Nevada proceed with the planning, financing and construction of the projects which would use this

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[28]See, for example, the Reclamation Project Act of 1939, Sections 9(d) and 9(e), 53 Stat. 1187, 43 U.S.C. 85.

water. In the case of Nevada, the acceleration of its growth has been comparatively recent. As shown in the record, however, at the present time, its rate of growth is one of the highest in the nation and the development is proceeding at a fantastic rate.[29]

Because of the physical fact that the Colorado River, at the points where Nevada can divert its waters, flows through a deep canyon, Nevada is confronted with a major development problem. It will take much time, planning and money to develop and complete the projects which will be eventually required to permit the use of Nevada's allotted share of water as her growth continues. It is submitted that the Secretary would have been guilty of an abuse of discretion if, in the light of his facts, he did not contract with the State of Nevada and its Colorado River Commission, the body authorized by the legislation of that State to represent it. And the quantity of water awarded Nevada is, as elsewhere herein noted, a bare minimum of the amount required.

D. Physical Background of the Suit.

Twenty-three years, nearly a quarter of a century, elapsed between the time of the enactment of the Project Act and the institution of this suit in 1952. During this period, many events occurred which have a bearing on the present controversy and which cannot be ignored in the decision herein. We have here perhaps another example of the situation where it is plain that the Court must consider all of the background of existing facts and circumstances.

Foremost in this array of events has been the completion of Hoover Dam itself, and the resultant control of all of the mainstream Colorado River at that point by that structure. Of equal importance has been the completion of the Imperial Dam which

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[29]Appendix I, pp. 73–77, 81–87, 97–98.

diverts the water into its companion facility, the All-American Canal, both long ago completed and used for the diversion of the major share of California's portion of the Colorado River water. Imperial Dam is the lower-most American structure, and all water passing it is susceptible of use only in Mexico.

Between Hoover Dam, the uppermost reservoir in the Lower Basin and Imperial Dam, there have been completed a series of other dams which are in descending downstream order, Davis Dam, Parker Dam, Headgate Rock Dam, and Palo Verde Weir. All of these structures were constructed by the United States and are presently under the management and control of Federal officials. Collectively, these structures result in complete physical control by the United States of all the water entering into, stored in reservoirs on or diverted from the mainstream in the Lower Basin.

As a result of this complex of structures and projects, the Court now finds the mainstream water in the Lower Basin thus under physical control of Federal officials. And the accompanying situation is that these officials make the continuing determinations as to available total water supply, the amount available for various diversions and all other determinations affecting the control, management and delivery of the Colorado River water.

Also, during this period of more than two decades, the water delivery contracts were entered into with the California agencies which divert water for use in that State; with the State of Arizona and the presently operating agencies in that State who are now using water from the mainstream; and with the Colorado River Commission of the State of Nevada.

As to the State of Nevada, the situation is that that State has been for several years diverting a portion of the water provided for in its contract with the Secretary of the Interior. It has been necessary to construct expensive pumping facilities and pipelines

to bring the water from Lake Mead to the high adjoining plateau where it is required and is being used. The Nevada use under this contract is a constantly expanding one. Plans are under way for the additional facilities that will be required for the constantly expanding growth of the area.

Accordingly, we now find that dominion and control of the waters of the main Colorado River from Lake Mead to the Mexican border by officials of the United States is an accomplished fact. We find, likewise, that water delivery contracts which, as we have pointed out, were well within the power and discretion of the Secretary of the Interior, have been executed and in a very substantial degree actually operative for a considerable period of time. And with respect to Nevada, we find that she has, in reliance on her contract, spent large sums of money in beginning the process of providing facilities for and diverting water from Lake Mead for use by her citizens. True, Nevada's start has been slow, and compared with California's uses, small, but it is a fact which must necessarily be considered in rendering a decision as to the fate of the mainstream waters.

E. The Contracts May Be Properly Used as the Fundamental Basis for the Allocation of the Mainstream Water in This Suit.

Summarizing the foregoing discussion, it is very clear that the Compact, the Project Act, the Limitation Act, and the general Reclamation Law, together, form an integrated body of law which not only authorized but required that there be water delivery contracts relating to the mainstream waters available to the three Lower Basin States. In no other way could an effective plan for the delivery and use of those waters be attained. And this contractual arrangement has been actually brought into being and use in a very substantial degree.

Accordingly, Nevada submits that she, as a sovereign State should be awarded the amount of water provided in her contract, namely, 300,000 acre feet of consumptive use (diversions less return) of Lake Mead water, and furthermore, that this amount of consumptive use should not be in any way diminished or reduced by reason of other water uses in Nevada from the tributaries above Lake Mead.

The last proposition is mentioned because there would be such diminution of Nevada's rights to mainstream water if effect is given Article 5(a) of the Contract between the United States and Nevada.[30] This Article purports to reduce Nevada's 300,000 acre feet of mainstream water by the amount of Nevada's upstream diversions.

There is nothing in the Project Act that authorized or directed the United States officials to limit the Nevada use of Lake Mead water by deducting therefrom other Nevada diversions. Nor could the act of any Nevada official in signing such a contract be deemed to be a waiver or release of any rights which that State, as a sovereign, possessed. It is fundamental that State officials do not have any power to surrender, abrogate, release or dispose of any of the rights of a sovereign State. Accordingly, from every angle, the provision in the Nevada contract, purporting to whittle down the Nevada Lake Mead allocation of 300,000 acre feet by the amount of tributary diversions elsewhere in the State would be *ultra vires*, void and unenforceable. For that reason in any water supply computation based on contract rights, Nevada is entitled to the full 300,000 acre feet of Lake Mead storage water, as Arizona concedes.

Arizona is confronted by the same problem as a result of Article 7(d) of her contract with the United States. The Special

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[30]Appendix 7, Report, p. 420.

Master has reviewed this problem at length in his Report at pages 237–247 and arrived at the proper and sound decision that such limitation provision is not only not supported by the Project Act, but, in fact, is contrary to the provisions thereof. He points out that such a provision can have no other effect than to violate the Project Act which provided that the water delivery contract should be "for permanent service." And also makes the proper comment that future upstream users would be in effect given priority over the older users under the Contract, if this paragraph were given validity. And he further points out that it is necessary to invalidate this paragraph in each the Arizona and Nevada contracts to be consistent with the real meaning of Section 4(a) of the Project Act as he interpreted it. Nevada, of course, concurs in the Special Master's Report and recommended decree in this respect.

IV.

THE RECOMMENDED DECREE IS IN REALITY AN EQUITABLE APPORTIONMENT OF COLORADO RIVER WATER

The decree proposed by the Special Master proposes a complete and efficient plan for dividing annually all available mainstream water among the three Lower Basin States.

There has been much controversy among the parties during the progress of this litigation as to the proper basic method of arriving at a decree to effectuate this purpose. Arizona and the United States urged a theory substantially like that adopted by the Special Master. California, while giving apparent lip service to a theory of equitable apportionment, such as has been followed in other interstate water cases in this Court, in reality, has at all times insisted on an allocation based upon actual appropriations and

uses under the laws of the various States. In effect, she was simply asking for a decree confirming existing appropriations only, but ignoring State lines. Nevada has urged that, as between sovereign States, the doctrine of equitable apportionment should apply, but departed from California's theory and urged that the Court could and should use its equitable powers in determining the share of water each of the Lower Basin States should ultimately be entitled to, and not limit allocations to the precise uses existing at the present time.

In his Report, the Special Master has pointed out precisely and in detail the reasons why and the method in which he has arrived at his decision. He has found specifically that the Project Act is the authority for the allocation and delivery of water[31] and that the principles of equitable apportionment or priority of appropriation which were found applicable in other suits for the interstate division were abrogated by the Project Act; and as also stated[32] "This case involves a statutory, not an equitable apportionment * * *." He has buttressed this basic conclusion by detailed analysis and reference to the legislative history of the Act and all of the surrounding circumstances, so that he came to the final conclusion that the intent of the Project Act was to make such a statutory allocation even though the literal words did not do so.

Nevada has complete confidence and respect in the determination of the Special Master and as has been noted, has not filed any exceptions to the basic provisions of his Report and proposed decree, but has only excepted to certain parts thereof not affecting the main conclusion.

However, being firm in her belief that this long existing controversy can and should be decided upon the voluminous record now before the Court, she urges that even should there be disagreement

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[31]Report, p. 151.
[32]Report, p. 100.

with the Special Master's interpretation of the Project Act, that his proposed decree is in reality an equitable apportionment of the waters of the main Colorado River stream and can be completely justified on that ground. Assuredly, if the Special Master's determination, that this is a purely statutory allocation suit, is in error, then the only other alternative would be to treat it as an action for equitable apportionment. Viewed in that light the Master's proposed decree, is entirely correct and proper, fully supported by the evidence and a proper exercise of the judicial authority.

Suppose, for example, that the Project Act was not in existence but that the United States had constructed, under the general Reclamation Law, all of the Lower Colorado River dams, reservoirs and diversions which are now in existence. And let us further assume that under such law, the Secretary of the Interior had entered into the contracts which are before the Court in this action. Then we make the final assumption that the same parties as are now here, were before this Court asking for an equitable apportionment of the mainstream water.

In that situation, the Court would assuredly have to take into account the contracts. These contracts would be as much evidence of the rights of the parties to the mainstream water as any other water right they might present, whether State appropriations, actual use or whatever. The *res* of such a suit would be principally the waters stored in reservoirs constructed and managed by the United States. No decree could be entered effectively apportioning the water in question without taking into account these contracts.

The contracts would, indeed, be proper yardsticks to be used by the Court in determining the rights of the parties. The Report of the Special Master herein and his proposed decree can easily be justified, even aside from and different from the theory of

statutory allocation, on the ground that in reality, he did use these contracts as yardsticks to measure the rights of the parties, and so using them equitably apportioned the waters of the river.

We are not aware of any instance in any suit for interstate division of water wherein the Court has ignored, or found invalid, a water delivery contract made between the proper Federal agencies and a water using entity providing for the use and delivery of stored water.

As a matter of fact, the Special Master has recommended the use of the judicial power of the Court, in his determination that in years of shortage the water should be prorated among the States in the same proportion as their contract right bears to each other. And he has again used this judicial power in his provision that present perfected rights, protected under the provisions of the Compact, must be filled in order of their priority, even if it requires ignoring State lines.

In view of the foregoing, Nevada respectfully urges that the decision recommended by the Special Master can be completely justified and upheld as a valid equitable apportionment of the mainstream Colorado River water, consistent with the position that Nevada has taken throughout these proceedings.

V.

ARGUMENT IN SUPPORT OF EXCEPTIONS OF STATE OF NEVADA

i

*The Special Master erred in providing in Paragraph II(B)(7) of the proposed Decree (p. 349) that "mainstream water shall be delivered to users in * * * Nevada only if contracts have been made by the Secretary of the Interior pursuant to Section 5 of the Boulder Canyon Project Act for delivery of such water; * * *."*

Nevada requests that, by apt language, Paragraph II(B)(7) (Report, p. 349) be amended so that the phrase "mainstream water shall be delivered to users in * * * Nevada only if contracts have been made by the Secretary of the Interior pursuant to Section 5 of the Boulder Canyon Project Act for the delivery of such water; * * *" be amended so that this restriction (i.e., apparently requiring individual users to have contracts with the Secretary of the Interior) be not applicable within the State of Nevada.

This provision of the proposed decree, so far as relates to Nevada may be an inadvertence inasmuch as the Report itself (p. 210) finds that contract between the State of Nevada and the Secretary of the Interior "does not require additional subcontracts between each water user and the Secretary of the Interior."

The reason for this requested change is that the Nevada contract with the Secretary of the Interior is, on this point, distinctly different from the Arizona contract. While the Arizona contract provides in Section 7(1) (Report, p. 403) that

> "Deliveries of water hereunder shall be made for use within Arizona to such individuals, irrigation districts, corporations or political sub-divisions therein of Arizona *as may contract therefor with the Secretary*, * * *."

The Nevada contract is different in that it is a contract, directly with the State, acting through its Colorado River Commission, and makes no provision for what might be called "sub-contracts" with other users. It is stated in the Contract, Section 5(a) (Report, p. 410)

> "The right of the State to contract for the delivery to it from storage in Lake Mead is not limited by this Contract. * * *"

and also in Section 5(b) (Report, p. 411)

"(b) Water agreed to be delivered to the State hereunder shall be delivered * * *."

and it is further provided in Section 6 (Report, p. 411)

"The State shall receive the water to be diverted by or delivered to it by the United States under the terms hereof at the point or points of delivery to be hereinafter designated * * *."

And in Section 1 (Report, p. 412), it is stated:

"The water to be delivered to the State hereunder * * *."

And in Sections 8, 9, 10 and 11 (Report, pp. 412–413), it is provided that the State shall make the necessary reports, that the charges shall be made to the State, that the State shall pay for water delivered, and that deliveries to the State shall be refused in the event of a default.

All of this is in conformity with the contract itself which is made with the "State of Nevada, a body politic and corporate, and its Colorado River Commission (said Commission acting in the name of the State, but as principal in its own behalf as well as in behalf of the State; the term State used in this contract being deemed to be both the State of Nevada and its Colorado River Commission)," (Report, p. 409).

As mentioned in this contract, the Colorado River Commission of Nevada is a body politic, acting for the State. The Commission was established by the Legislature of the State of Nevada and the Act appears in Chapter 538 of the Nevada Revised Statutes, and specifically, Sections NRS 538.040–538.260, as amended. Pertinent parts of this legislation is set forth in Appendix II hereof. Specifically, Section NRS 538.160 authorizes the execution of a contract such as that involved in this action; Section NRS 538.170 authorizes the Commission to receive the water

covered by the contract for the State of Nevada and to make necessary appropriations therefor, and Section NRS 538.180 authorizes the Commission to make all necessary leases, sub-leases, or contracts of sale of the water obtained through the contract with the United States. As shown by the record herein, the State, through the Commission, has been the entity which has received the water available from Lake Mead and the Colorado River, paid the charges due the Secretary under said contract and made the necessary State appropriations therefor.

Nevada submits that to continue this program as conceived by the contract provisions is, in this instance, better both from the point of view of the United States and the State. In all probability, the uses in Nevada will be principally industrial, domestic or municipal. It is not a case of there being a comparatively few large irrigation or municipal projects, as in Arizona or California, but on the contrary, many small users. The Commission is constituted for the purpose, and can conveniently and efficiently perform the functions required by the United States in connection with the contract for Colorado River water, as well as best serve the interests of the users in the area.

It is submitted that this arrangement with Nevada in the contract is in accord with Section 5 of the Project Act (Report, pp. 384–385), and that the State of Nevada is a "person" as used in that section of the Project Act and, therefore, entitled to have the use of the water contracted for.

For the foregoing reasons, Nevada respectfully submits that there be the necessary changes in the language of Paragraph II(B)(7) (Report, p. 349), in conformance with the Special Master's finding in his Report (p. 210).

ii

The Special Master erred in finding in the Report, at pages 234 to 237, 311 and 312, and in Paragraphs II(B) (5) and (6) of the Recommended Decree, that a part of Nevada's allocation of water may be used to supply the so-called "present perfected rights" in other States, in years when the allocations of such other States are not sufficient to supply said rights.

And as an alternative, the Special Master erred in not providing a minimum figure below which the allocation of the State of Nevada could not be reduced, if, and when, it ever becomes necessary to take water away from Nevada's allocation for supplying so-called "present perfected rights" in other States.

By Paragraphs II(B)(5) and (6) (Report, pp. 348–349), a plan is outlined whereby one or two of the mainstream States shall make contributions to insure full delivery of present perfected rights to the third State, or to two States (II(B)(4)), and in the event of extreme shortage for the satisfaction of present perfected rights by priorities without regard to State lines (II(B)(6)).

Nevada submits that in the exercise of this Court's equitable powers, it should amend Paragraph II(B)(5) to provide that no part of Nevada's allocation of water may be used to supply the so-called "present perfected rights" in Arizona and California in years when the allocations of such States are not sufficient to supply such rights, or in the alternative, the decree should contain a provision providing that Nevada's deliveries shall never be reduced below a minimum figure (not less than 250,000 acre feet), provided there is present actual need therefor.

Such a requirement is necessary because, as is shown by the evidence herein, the Nevada users of mainstream water are, and

will be of the type which it is necessary to maintain, i.e., municipal, domestic or industrial. In other words, there will not be uses, such as irrigation uses, which can be temporarily suspended without disaster. Uses such as domestic and municipal cannot be arbitrarily cut off, or even heavily reduced, for a period of time, as can agricultural uses.

The factual situation presented is that out of the basic allotments, California will have present perfected rights approximating 70 percent or more of her total apportionment of 4.4 million acre feet; Arizona will have perfected rights constituting 21 percent or more of her apportionment of 2.8 million acre feet. While on the other hand, Nevada's mainstream present perfected rights are not in excess of 3 percent of her State allotments; and even this amount comprises solely the rights for the Fort Mohave Indian Reservation and the Lake Mead National Recreational Area.[33] In the event of a severe reduction in the amount of water released by the United States in any given year, a situation could arise, under the decree as now proposed, wherein all the water would go to the present perfected rights of California and Arizona and practically none would be available for Nevada.

It appears to Nevada that the present Report goes further than necessary in protecting present perfected rights as among the downstream States.

The only thing provided by Article VIII of the Compact (Report, p. 376) with respect to the priority of these rights is first, that they are unimpaired by the Compact (the Report has construed the Compact as being nothing more than an apportionment of water between the Basins and as being entirely irrelevant in the

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[33]See Appendix III, p. 110, being a tabulation of "present existing rights" as of June 25, 1929.

apportionment of water among states); and secondly, that whenever a storage capacity of 5 million acre feet is available in the Lower Basin, present perfected rights must be supplied out of that storage as against appropriators or users in the Upper Basin.

The Project Act merely provides in Section 6 (Report, p. 387) that the dam and reservoir shall be used for the "satisfaction of present perfected rights in pursuance of Article VIII of said Compact * * *." In other words, it does not create any priorities as between downstream States, above and beyond that created by the Compact which, as noted above, have been determined to be non-existent. Neither does it pretend to assure such rights a better water supply than they had before the Compact.

Accordingly, it would seem that the decree as drawn is an exercise of the equitable power of the Court in providing for the priority of these present perfected rights as among the three downstream States and is not based on any specific statutory language, or authority. Accordingly, inasmuch as this portion of the decree is an exercise of this Court's equitable powers in that regard, it is fully within the power of this Court to provide that no part of Nevada's allocation of water shall be used to supply so-called "present perfected rights" in other states, or in the alternative, to place a floor, as suggested above, below which the deliveries to Nevada shall not be cut.

There will come a time in the future that some assured amount of water will be necessary for the very preservation of life and existence in the Southern Nevada area. On the other hand, assurance of this limited amount will not and cannot materially impair the much larger allotments (which are principally for agricultural use) in the other two Lower Basin mainstream States.

iii

The Special Master erred in failing to recommend in his Report, or provide in his recommended decree, for the appointment of a Commissioner with the power to supervise the operation of the Colorado River in the Lower Basin and the delivery, annually, among the various parties of the waters awarded to them by the decree herein (Report, p. 314).

Nevada, in its briefs before the Special Master, strongly urged that whatever course the decree of this Court might follow, there should be appointed a Commissioner by this Court to administer the decree. After careful analysis of the proposed decree recommended by the Special Master, we believe that the appointment of a Commissioner, an officer of this Court, is essential. Such a Commissioner would necessarily have to make annual determinations as to the amount of water that may be expected to be available, and the portion thereof which will be available to the three mainstream States in accordance with the basic decision recommended by the Special Master.

Nevada also recommended the appointment of an Advisory Board composed of representatives of each of the States of Arizona, California and Nevada to assist and advise the Commissioner, and we reaffirm that recommendation and recommend also that a representative of the Secretary of the Interior be made a member of that Board.

We believe it to be a logical solution of this case that there be made a basic allocation of water among the mainstream States such as the Special Master has recommended and that then this Court retain jurisdiction through its own Commissioner to make annual allocations in accordance therewith. Nevada submits that the allocations recommended by the Special Master, together with the continuing jurisdiction by a Commissioner, will result

in the highest degree of justice and in the most efficient division of the water among the parties to this action.

The proper utilization of mainstream waters available at Lake Mead and from Lake Mead to the International Boundary requires an annual determination of the amount thereof available on a basis of diversions less returns to the river with due consideration to Lower Basin inflows at Lee Ferry, inflows from tributaries between Lee Ferry and Lake Mead, mainstream reservoir and channel losses, deliveries to Mexico, regulation losses, storage on hand at Lake Mead and other factors including also the avoidance of greatly fluctuating supplies of water within the amount corresponding to the Compact apportionments to the Lower Basin.

The determination of annual water supplies available for use by the States of Arizona, California and Nevada, in accordance with the decree recommended by the Special Master should be made by a Commissioner appointed by the Court and should be annually announced by him at a designated time. Such Commissioner should have the authority and responsibility for the record of mainstream inflows at Lee Ferry and inflows from tributaries, the periodic determination of depletions by each State on the tributaries, the mainstream uses of water, and the submission of annual reports in appropriate number covering the activities described. The costs of such activities should annually be advanced by the States of Arizona, California and Nevada in proportion to the amounts of mainstream water allocated to them.

iv

The Special Master erred in failing to recommend in his Report or include in his recommended decree, provision for the promulgation of Rules and Regulations by the Officer in charge of operating the Colorado River, after the Decree is entered herein, setting forth in detail the manner, method and plan, including time schedules, to be used annually in

regulating stream flows, in managing and controlling regulatory structures and in allocating and distributing water to the parties entitled thereto; and also providing for cooperation with representatives of affected States in accordance with Section 16 of the Boulder Canyon Project Act (45 Stat. 457; 43 USC 617).

Nevada respectfully suggests that the decree specifically provide that the Officer in charge of operating the Colorado River, after the decree is entered herein, shall promulgate Rules and Regulations relating thereto. If this is done, all of the interested parties will be more aware of the planned procedure and activities, and it should tend to remove misunderstandings and possible friction. Generally, in the Western States, such Rules and Regulations are of material assistance in operating streams with complex and complicated rights thereon.

Some of the subjects which, among others, could very properly be covered by such Rules and Regulations, rather than in a more inflexible decree, are:

(a) The approximate time when the Secretary will annually announce to the interested parties the amount of controlled water that will be available for release in that water year.

(b) The definition of, and the manner of measuring those diversions which consist of wells in the mainstream valley so that they result in the diversion of water that is hydraulically connected with the mainstream flow.

(c) Provisional regulations concerning the manner and method of determining when contributions shall be made by each of the Upper and Lower Basins for the Mexican delivery in accordance with Article III(c) of the Compact; the point at which the Upper Basin contributions to Mexico shall be measured; and the manner and method of computing transportation; and evaporation losses thereon.

CONCLUSION

Nevada submits that the division of mainstream water proposed by the Special Master is a fair and just allocation and should be sustained. It is logical and proper.

Nevada is willing to accept the allocation of mainstream water proposed by the Special Master, even though Nevada's share is a bare minimum of the amount of water which will be required for existing and future uses.

The Special Master's proposed division of mainstream water can be sustained on any one of several legal theories. It can be sustained under the theory of statutory allocation adopted by the Special Master. In the absence of the Project Act, contracts, such as the one with the State of Nevada, would have been valid and could be judicially sustained, under the general Reclamation Law. Or if this action be considered one for equitable apportionment, it would be judicially proper to use the contracts made by the Secretary of the Interior, such as that with Nevada, as a yardstick, and evidence of the right to the use of mainstream water, which could and should be sustained in any decree entered herein.

Respectfully submitted,

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Dated May 15, 1961.

APPENDIX I

PRESENT AND FUTURE WATER REQUIREMENTS FOR COLORADO RIVER BASIN IN NEVADA

I.

GENERAL

Description of Colorado River System.

The Colorado River is one of the major stream systems of the United States, with its most northerly tributaries rising in the high mountains of southwestern Wyoming, eastern Utah and western Colorado. From there it flows southerly until it passes into Mexico and empties into the Gulf of California. Through many tributaries it drains southwestern Wyoming, the western slope of the Rocky Mountains in Colorado, eastern Utah and southeastern Nevada. Other tributaries arising in western New Mexico, flow westerly through the State of Arizona into the main stream. It forms part of the border between Arizona and Nevada and all of the border between Arizona and California.

Substantially the whole of the State of Arizona is within the Basin. While California borders the river, no tributaries arise in that State.

The Salton Sea, a below sea level depression or "dead sea," lies approximately 60 miles westerly of the main river, and approximately 50 miles north of the California Mexican boundary. During disastrous floods in the early 1900's, the whole river broke through canal headings, and for a time poured into this Sea instead of following its normal course to the ocean. At the present time, this Sea receives the waters of some streams flowing northerly from Mexico, and all of the drainage waters and return flow from the Imperial Valley Irrigation Project and the Coachella Project in California.

The areas adjacent to the river and its major tributaries are semiarid or arid in nature. The lands in these areas require the artificial application of water for the production of agricultural crops. In the southern part of the Basin, true desert conditions prevail.

The so-called Lower Basin area is in this southern desert portion. The climatic conditions in this area are such that the amount of Colorado River System water available in any given section will inevitably be the limiting factor on the future growth of that area, whether agricultural, industrial or municipal.

After leaving the southern boundary of California, the river for approximately 20 miles forms the boundary line between Mexico and Arizona (the limitrophe section). It then flows for approximately 75 miles through Mexico to its mouth at the Gulf of California. A great irrigated area in Mexico is dependent upon the waters of the Colorado River.

In this action there is involved that portion of the Basin of the Colorado River which is defined in the Colorado River Compact (Article II(g)) as the Lower Basin. There is, therefore, involved herein all of the waters entering the Lower Basin at Lee Ferry, the waters arising in all of the tributaries of the Colorado River whose mouths are below Lee Ferry, and all water entering or re-entering the main stream from any source between Lee Ferry and the International Boundary. Area-wise, the action affects all of the portions of the States which are party to the action from which waters naturally drain into the river below Lee Ferry, and also (as described in the Compact, Article II(g)), "* * * all parts of said States located without the drainage area of the Colorado River System which are now or shall hereinafter be beneficially served by waters diverted from the System below Lee Ferry."

Description of Colorado River Basin in Nevada.

The drainage basin may be described as follows: Starting in the southern-most tip and extending along the California-Nevada line about 45 miles to the summit of the McCullough range; then north along the summit of that range, and then northwesterly, crossing U. S. Highway 91 and along the summit of the Spring Mountain range through the Nevada National Forest just beyond Lee Canyon; thence in a northeasterly course, crossing U. S. Highway 95 a few miles south of Indian Springs and following a series of mountain ranges in the northeasterly direction to about 8 miles westerly of Caliente; then the drainage line takes a more northern course passing about 9 miles west of Pioche to a couple of miles south of the first standard parallel south; then a general easterly course to the State Line, and then down the Utah State Line about 9 miles to where the drainage divide comes back into the State of Nevada in a southwesterly direction and then turns back and hits the State Line just opposite Caliente; then down the State Line to the Colorado River and along the Colorado River 145 miles to the point of commencement. The length of the drainage basin is approximately 240 miles in a north-south direction line and about 90 miles at its widest point. It has an area of about 12,000 square miles and represents 5 percent of the area of the entire Colorado River Drainage Basin. It also represents about 11 percent of the total area of the State of Nevada.[1]

Principal Cities.

The principal cities in Clark County are Las Vegas with a population in 1956 of 48,500; North Las Vegas with a population of 12,900; Henderson with a population of 14,000; and

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[1]Nev. Exs. 1 and 2, Tr. 16,204; Tr. 16,205–16,206; Appendix IV, p. 113.

Boulder City with a population of approximately 4,000. The principal towns in Lincoln County are Caliente and Pioche. The total population of the Colorado River Basin in Nevada was approximately 118,000 in 1957.[2]

Principal Railroads and Highways.

The main line of the Union Pacific Railroad serves most of the Colorado River Drainage Basin in Nevada. It extends from Los Angeles to Las Vegas, then northeasterly to Moapa, follows the Meadow Valley Wash to Caliente where it turns easterly and goes up the Clover Creek area into Utah. A few miles south of Las Vegas a branch line extends to Boulder City and Hoover Dam. A few miles further south another branch line runs from Arden to the Blue Diamond Gypsum Mine and plant. From Moapa a branch line runs down the Muddy River to Overton. At Caliente another branch line follows up the Meadow Valley Wash to Patterson Wash and over to Pioche and the Caselton Mines.

There is one transcontinental east-west highway—U. S. 91, which comes in from the direction of Los Angeles, passing through Las Vegas, Glendale and Mesquite, thence into Arizona, Utah and eastward. There are two north-south transcontinental highways—U. S. 95 and U. S. 93. U. S. 95 comes down from Oregon through Reno, Goldfield, Tonopah and comes through the Basin at about Indian Springs and to Las Vegas. It then joins with U. S. 93 at Railroad Pass, a point just westerly of Boulder City where it takes a southerly course through Eldorado Valley to Needles, California. U. S. 93 comes in from the eastern part, down from Idaho through Ely and comes in by Pioche, Caliente into Glendale, and then joins U. S. 91 to Las Vegas and 93 to

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[2]Nev. Exs. 1 and 2, Tr. 16,206–16,207.

Railroad Pass. It then continues on to Boulder City and across Hoover Dam to Kingman and Phoenix.[3]

Description of River Systems in the Colorado River Basin in Nevada.

Virgin River: The principal tributary to the Colorado River in Nevada is the Virgin River. The Virgin River heads in southwestern Utah, takes a southwesterly course, and cuts across the northwest corner of Arizona in Mohave County, enters Nevada at about the location of the town of Mesquite and thence to Lake Mead. In Utah below the town of St. George the river enters a narrow canyon passing through the Beaver Mountains. This canyon, called the "Narrows," extends 17 miles in length. During the low flow of the Virgin River, which occurs from about May through October, very little of the natural flow gets all the way through the canyon. The irrigated land in Arizona and Nevada depends mostly on some saline springs, containing about 2,500 per million of salts, that rise just above the town of Littlefield. The Virgin River drains approximately 6,000 square miles, of which 2,900 are in Utah, 1,100 in Nevada, and 2,000 in Arizona.[4]

Muddy River: The Muddy River commences about where the second standard parallel south intersects the western boundary and about 15 miles above the confluence of Kane Springs Wash. The channel extends about 35 miles in a southerly direction and then turns easterly, then through the Moapa Indian Reservation and to Glendale where the Meadow Valley Wash joins the Muddy River. It then continues southeasterly to Logandale and Overton to Lake Mead. The drainage area of the Muddy River,

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[3]Nev. Ex. 1, Tr. 16,204, 16,207.

[4]Nev. Exs. 1 and 2, Tr. 16,209–16,210.

excluding the Meadow Valley Wash, is about 1,650 square miles and prior to the construction of Lake Mead was tributary to Virgin River several miles below the town of Overton. At the present time it flows directly into Lake Mead rather than into the Virgin River. The flow of Muddy River originates in a series of thermal springs about 12 miles above Glendale. The springs are uniform month by month and year by year in flow with an average yearly flow of 34,000 acre feet. Two or three times each year minor storms above the Warm Springs contribute to the flow but such flows are of short duration and inconsequential. About once in every 10 years a large flood comes down, but for the most part the stream bed above Warm Springs is dry. The water from the Warm Springs contains about 700 parts per million of dissolved solids.[5]

Meadow Valley Wash: The Meadow Valley Wash stream system originates in Lincoln County near the first standard parallel north, runs south through Spring Valley and through a series of little valleys, through Condor Canyon to Panaca and along to Caliente. At Caliente it is joined by Clover Creek which drains the area toward the Utah boundary, and thence proceeds southerly some 70 miles to where it joins with the Muddy River at Glendale. The drainage area of the Meadow Valley Wash is 2,500 square miles. The flow of Meadow Valley Wash originates in Spring Valley through a series of springs which rise in an alpine meadow area. During the irrigation season this water is all used for irrigation in Spring Valley and in the three small valleys between Spring Valley and Panaca. Just above the town of Panaca in Panaca Valley there is a large spring flowing 8 second feet which furnishes most of the irrigation water for the Panaca area. Meadow Valley Wash is divided into Upper Meadow Valley Wash and Lower Meadow Valley Wash at

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[5]Nev. Exs. 1 and 2, Tr. 16,230, 16,232.

a point on the Lincoln County and Clark County line. Meadow Valley Wash from Caliente to Glendale is usually dry from the latter part of April through December except when a cloudburst occurs.

Meadow Valley Wash below Caliente, and for a distance of about 70 miles, is a typical dry desert stream and under both conditions, i.e., those existing prior to the advent of man in the area, no material contribution of water was or is made from this stream to the Colorado River System; the only time water ever flows from the Meadow Valley Wash into the Muddy River and Colorado River is on rare occasions of unique desert storms and only then for brief periods of time. While the Meadow Valley Wash is a tributary of the Muddy and the Colorado and contributes occasional flood waters thereto, the irrigation uses on that stream do not affect the contribution to the main stream.[6]

Existing and Future Irrigation Uses in Colorado River Basin in Nevada.

The total area of land being irrigated in Nevada from the Virgin River in 1956 was 2,800 acres. Broken down into areas, the Mesquite Irrigation Company furnishes water for 1,360 acres, the Bunkerville Irrigation Company furnishes water for 960 acres, and the area below Bunkerville in the vicinity of the Riverside Bridge, and below, an additional 480 acres were being irrigated. Irrigation in this area started in 1865 and has been continuous since about 1880.

There are approximately 5,000 acres of irrigable lands not now being irrigated which are susceptible of irrigation from the Virgin River. Of this amount 2,200 acres are alluvial slope lands consisting of about 300 acres in the Mesquite area, 310 acres

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[6]Nev. Exs. 1 and 2, Tr. 16,252–16,255; Tr. 16,274, 16,282–16,289.

in the Bunkerville area, and approximately 1,590 acres between Riverside and Lake Mead. In addition there are 2,800 acres of bottom lands along the Virgin River which can be reclaimed. Phreatophytic growth on the river bottom lands now consumes about 5 acre feet per acre. These lands, when reclaimed and placed into cultivation, would save or salvage as much as 80 percent of that present use. In other words, only about 20 percent more water would be needed for cultivated crops.[7]

The beneficial consumptive use requirement for the total of 7,800 irrigated and irrigable acres would be 36,496 acre feet.[8]

The total number of acres being irrigated from Muddy River in 1954 was 5,240 acres. Areas irrigated from the Muddy River are divided into the Upper Moapa Valley and the Lower Moapa Valley. Of this amount, 1,860 acres were located in the Upper Moapa Valley and 3,380 acres were located in the Lower Moapa Valley. Of the 1,860 acres irrigated in the Upper Moapa Valley, 355 were on the Moapa Indian Reservation. With the exception of 350 acres of land being irrigated in the Overton Wildlife Management Area, all lands irrigated in the Lower Moapa Valley are served by the Muddy River Valley Irrigation Company. Irrigation was first started on the Muddy River in 1865 by Mormon colonists from Utah. They settled at St. Thomas, a community that is now covered by Lake Mead. In 1870 the colonists were recalled and did not return until about 1881 and there has been irrigation continuously since that time.[9]

In the Moapa Valley, consisting of three units—Upper and Lower Moapa Valley and Lower Meadow Valley Wash—there are 7,180 acres of irrigable land not now being irrigated. Of this

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[7]Tr. 16,404–16,405, Nev. Ex. 201, Tr. 16,401; Nev. Ex. 209, Tr. 16,467.

[8]Nev. Exs. 208, 209, 210, Tr. 16,451–16,457.

[9]Nev. Ex. 34, Tr. 16,328; 16,237–16,241.

amount 1,830 acres of irrigable land in the Upper Moapa Valley are susceptible of irrigation from the Muddy River and by pumping from underground sources. The Lower Meadow Valley Wash has no irrigation at the present time. There are approximately 5,000 irrigable acres but, because of the elevation of the upper end, only 3,030 acres in the lower end are considered feasible for irrigation. Water for these lands would be furnished on an exchange basis. Water now used in the Lower Moapa Valley could be diverted by gravity to the irrigable lands in Lower Meadow Valley Wash and water would be pumped from Lake Mead to lands in Lower Moapa Valley now being irrigated from the Muddy River. There are 2,325 acres of irrigable land in the Lower Moapa Valley susceptible of irrigation. The source of water would be Muddy River and water saved by better utilization of the present supply, better management and better systems of irrigation. It would also be feasible to pump water for irrigation from Lake Mead.[10]

The total beneficial consumptive use requirement for the 12,425 irrigated and irrigable acres would be 52,273 acre feet.[11]

There are 5,050 acres now irrigated in Upper Meadow Valley Wash. As heretofore pointed out (*supra*, p. 68), however, the water used for irrigation is not Colorado River System water. In addition there are 1,840 acres of irrigable lands which may be feasibly irrigated from the existing water supply. There is a much larger area of irrigable land but no available water for irrigation other than the 1,840 acres. The total beneficial consumptive use requirement for the 6,890 acres of irrigable acres would be 21,480 acre feet.[12]

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[10]Tr. 16,423, 16,424, 16,426, Nev. Ex. 201, Tr. 16,401.

[11]Nev. Exs. 208, 209, 210, Tr. 16,451–16,447.

[12]Tr. 16,436, Nev. Ex. 201, Tr. 16,401; Nev. Exs. 208, 209, 210, Tr. 16,451, 16,457.

There are two units in the Fort Mohave-Big Bend area. The upper, or Big Bend unit, consists of 500 irrigable acres. The lower, or Fort Mohave unit, consists of 1,600 irrigable acres of public domain lands and approximately 2,150 irrigable acres in the Fort Mohave Indian Reservation section. Water will be available by pumping from the Colorado River. There is no irrigation at the present time. The lands are now covered by a phreatophytic growth consisting of willows, cottonwood, mesquite, and various types of native vegetation. Approximately 15,000 acre feet is now being consumed by this phreatophytic growth. These lands, when reclaimed, would save or salvage about 80 percent of the present nonbeneficial use. In other words, only about 20 percent more water would be needed for cultivated crops.[13]

The total beneficial consumptive use requirement for the 4,039 irrigable acres would be 16,217 acre feet.[14]

There were 2,150 acres being irrigated in Las Vegas Valley in 1954 from underground water sources with a diversion requirement of 15,179 acre feet. There is no return flow and there is no irrigation from surface sources. The ground water used for irrigation is not part of the Colorado River System. No portion of the Las Vegas ground water supply flows into or contributes to the water supply of the Colorado River System and none of the ground water used would have reached or contributed to the water supply of the Colorado River. It is not anticipated that there will be any increase in commercial irrigation in excess of the 2,150 acres now being irrigated in Las Vegas Valley.[15]

Future land and water usage in Las Vegas Valley, as well as Eldorado Valley, Apex Dry Valley, California Wash, Mormon

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[13]Nev. Ex. 201, Tr. 16,401; Tr. 16,444–16,445, Tr. 16,447.

[14]Nev. Ex. 207, Tr. 16,451; Nev. Exs. 209 and 210, Tr. 16,461–16,467; Nev. Ex. 101, Tr. 16,383.

[15]Nev. Exs. 208 and 210, Tr. 16,467; Tr. 16,326; Nev. Ex. 601, Tr. 16,682; Tr. 16,709–16,711.

Mesa, and certain portions of Moapa Valley, hereinafter described, will be for industrial use and for small home site tracts and not for commercial irrigation.[16]

The total number of irrigated and irrigable acres susceptible of irrigation by existing water supplies from the Colorado River Basin in Nevada is 33,304 acres with a diversion requirement of 257,539 acre feet. The return flow would be 115,894 acre feet and the beneficial consumptive use would be 141,645 acre feet.[17] There is deducted from the beneficial consumptive use of 21,480 acre feet for irrigated and irrigable lands in Meadow Valley Wash and 15,179 acre feet being beneficially consumptively used in Las Vegas Valley since the sources of this water for irrigation make no contribution to the Colorado River System. There is also deducted 11,200 acre feet "salvaged" by reclaiming 2,800 acres of Virgin River bottom lands. The net amount of water needed by the year 2000 for the irrigated and irrigable acres in Nevada in the Colorado River Basin for beneficial consumptive use from the Colorado River System would be 93,786 acre feet.

II.

PAST AND PRESENT GROWTH IN LAS VEGAS VALLEY—CLARK COUNTY

The Las Vegas Valley which lies entirely within the boundaries of Clark County, is a northwest-southeast trending valley bounded on the West by the Spring Mountains, on the Northeast by the south parts of Desert Range, Sheep Mountain Range, and Las Vegas Range. The east part of the valley is bounded by Frenchman Mountain and a lower range of unnamed hills extending to Las Vegas Wash. The eastern boundary of the

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[16]Nev. Ex. 211, Tr. 16,467.

[17]Nev. Ex. 210, Tr. 16,467; Tr. 16,284–16,288; Tr. 16,406.

valley floor is about 10 miles from the Colorado River. The south end of the valley is bounded by the River Mountains and the north extremities of the McCullough Range. The valley covers approximately 400 square miles.[1]

The large springs just westerly of Las Vegas are known as the Las Vegas Springs ("The Meadows" in Spanish), and were used as watering places by Indians long prior to the coming of white man. The springs were known to the Spaniards as early as 1770. The Mormons started settlement about 1855 but this was abandoned about 1857. After 1857, some use was made of the springs by others for agricultural purposes but the valley was sparsely settled until the early part of the 20th century. In 1905 the San Pedro-Los Angeles and Salt Lake Railroad, now the Union Pacific, was completed and Las Vegas was made a division point due to the excellent water supply from the springs. Shortly after that a subsidiary of the railroad company known as the Las Vegas Land & Water Company laid out the original townsite and built a water works system to attract workers and settlers to that area.[2]

The growth of the Las Vegas area during the past 25 years has been phenomenal. Las Vegas has grown from virtually nothing in 1905 to its present state of development. The townsite was laid out in 1905 after Las Vegas was selected as a division point for the San Pedro-Los Angeles and Salt Lake Railroad Company but it was not incorporated until 1911. The population census in 1910 showed a population of 800 in Las Vegas, and 3,331 for all of Clark County. The community grew slowly. The 1930 census showed 5,165 in Las Vegas and 8,632 in Clark County. The construction of Boulder Dam which commenced in 1930 accelerated its growth. In 1940 the population

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[1]Nev. Exs. 1 and 2, Tr. 16,204; 16,295–16,296.
[2]Tr. 16,296–16,299.

of Las Vegas was 8,422, Boulder City 2,600 and Clark County 16,414.[3]

The accelerated growth commenced with World War II and has continued ever since. The Basic Magnesium Project was commenced in 1941. Following the close of World War II, Basic Magnesium, Inc. was acquired by Basic Management, Inc. which has contributed materially to the growth, not only to the City of Henderson, but the Las Vegas area. Nellis Air Force Base was constructed during the War and has increased in size since that time. During the 1940's the "Strip" resort hotels were commenced and there is now a 4-mile row of resort hotels. The population of Las Vegas increased from 8,422 in 1940 to 53,000 in 1956, and in Clark County from 16,414 to 115,000 during the same period.[4] The 1960 census showed a population in Clark County of 127,016.[5]

The City of Las Vegas is the principal residential area and trading center in Southern Nevada. It is located about 290 miles northeast from Los Angeles, about 450 miles south of Salt Lake City, Utah, and 330 miles northwesterly of Phoenix, Arizona. Los Angeles is the nearest center of large population. The city was incorporated in 1911 and now covers an area of 24 square miles. North Las Vegas, which joins the City of Las Vegas on the north, was incorporated in 1946 and it covers an area of 6¼ square miles. It had a population in 1956 of 12,900. The City of Henderson is located 12 miles southeast of Las Vegas adjacent to the Basic Management, Inc. plants. It was incorporated in 1953 and has an area of 13 square miles. It had a population of 14,000 people in 1956. Boulder City is located about 24 miles southeast of Las Vegas and is at the northern end of Eldorado

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[3]Tr. 16,558–16,560.

[4]Nev. Ex. 401, Tr. 16,565; Tr. 16,560–16,561.

[5]General Population Characteristics, Final Report RC(1) 30B of the Department of Commerce.

Valley. It is the headquarters of Region 3 of the Bureau of Reclamation and the United States Department of Mines operates a research plant there. The population of Boulder City in 1956 was about 4,000.[6]

At least 30,000 people reside in the Las Vegas Valley outside of the incorporated towns. The centers of population outside of the incorporated towns are Paradise Valley, which is southwest of Las Vegas; the "Strip" area adjacent to U. S. 91 on the way to Los Angeles, and there are a large number of homesite tracts scattered around the valley in which several thousand people now live. The Nellis Air Force Base, which is the largest jet aircraft training center in the country, is located about 8 miles northeast of Las Vegas. Near this Base, the Navy has constructed the large Lake Mead Naval Ammunition Depot. Also, the proving ground of the Atomic Energy Commission, Frenchman's Flat, is located about 60 miles northwest of Las Vegas. The population of Clark County in 1956, was 115,000. The population in 1950 was 48,300. The percentage of growth has been 139 percent in six years.[7]

The phenomenal growth of the Las Vegas area is disclosed by the following growth statistics. The population of Clark County increased from 8,532 in 1930 to 16,414 in 1940, to 48,289 in 1950 and to 115,000 in 1956. Plane traffic has increased from 35,000 passengers in 1948 to 585,000 in 1957. Bank deposits have increased from $5,966,000 in 1941 to $105,380,000 in 1957; motor vehicles have increased from 8,000 in 1941 to 61,400 in 1958; property tax valuations have increased from $18,213,000 in 1941 to $224,200,000 in 1957; postal receipts have increased from $77,000 in 1940 to $1,069,000 in 1957; telephone service has increased from 1,808 in 1941

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[6]Tr. 16,299–16,302.
[7]Tr. 16,299–16,302.

to 34,500 in 1957; school enrollment has increased from 2,500 in 1941 to 17,000 in 1957.[8]

III.

EXISTING WATER SUPPLY AND WATER USES IN LAS VEGAS VALLEY—CLARK COUNTY

Until construction of the Las Vegas Water District pipeline in 1956, the sole source of water supply for Las Vegas Valley other than the City of Henderson and the Basic Management, Inc. plants was from ground water sources. Until 1945, ground water use in the area was such that ground water sources were adequate. Since that time the population has increased so rapidly that the ground water basin is being depleted and is now greatly overdrawn.

The total discharge in 1956 from the ground water basin was 52,400 acre feet. The average annual replacement is 27,000 acre feet so that there is a present annual overdraft of 25,400 acre feet which must be replaced from water from Lake Mead.[1]

Of this amount 47,000 acre feet were beneficially used. There were 5,400 acre feet lost by "upward leakage" which could not be beneficially used. Of the 47,000 acre feet beneficially used, 30,704 acre feet were for municipal and domestic purposes, 1,126 acre feet for industrial purposes and 15,179 acre feet for irrigation.[2]

In recent years ground water use in the Las Vegas area has been supplemented by water pumped from Lake Mead through the BMI (Basic Management, Inc.) pipeline. In 1956, 24,370 acre feet were pumped from Lake Mead, and of this amount

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[8]Nev. Ex. 401, Tr. 16,563.
[1]Nev. Ex. 33, Tr. 16,307, 16,322.
[2]Nev. Ex. 29, Tr. 16,314; 16,311.

1,770 acre feet were measured into the Las Vegas Water District pipeline to the Las Vegas area and used for municipal purpose. The sole source for industrial uses at the Basic Management, Inc. plants at Henderson is water from Lake Mead pumped through the BMI pipeline. In 1956 with the 21,700 acre feet pumped through the pipeline, 15,560 acre feet were actually used by the BMI industries. There were 4,370 acre feet used by the City of Henderson in 1956. Also, 2,670 acre feet were used by Boulder City through its own pipeline from Lake Mead.[3]

The total amount of water beneficially used in 1956 in the Las Vegas Valley, including Boulder City, from water pumped from Lake Mead and from the ground water basin for domestic and municipal purposes and for industrial uses was, exclusive of irrigation uses, 56,200 acre feet. Of this amount, 24,370 acre feet were pumped from Lake Mead—8,810 for domestic and municipal use and 15,560 for industrial use. The balance, 31,830 acre feet, was from ground water sources—30,700 acre feet for domestic and municipal uses and 1,130 acre feet for industrial use.[4]

IV.

APPROPRIATIONS FOR EXISTING AND FUTURE USE OF WATER IN CLARK COUNTY FROM LAKE MEAD

Prior to 1958, seven appropriations have been made for water from Lake Mead for use in Las Vegas Valley and two appropriations have been made for water from the Colorado River below Lake Mead. These appropriations were initiated by applications to appropriate to the State Engineer of Nevada. Permits

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[3]Tr. 16,329; Nev. Ex. 504, Tr. 16,652, 16,849; Nev. Ex. 808, Tr. 16,834.

[4]Nev. Ex. 808, Tr. 16,834.

to appropriate have been granted, and in four cases, certificates of appropriation have been issued. The amounts of water total 163.5 c. f. s. or 118,365 acre feet. The names of the appropriators and the amounts appropriated are:

Name of Appropriator	Permit No.	Cert. of Approp.	Amount of Appropriation — Second feet	Amount of Appropriation — Acre ft. per year
Basic Management, Inc.	10779	3118	37.264	26,973
Western Electro-chemical Co.	10779	3118	7.736	5,598
Basic Management, Inc.	10779	3119	12.000	8,685
Reconstruction Finance Corp.	10861	4101	5.000	3,619
Las Vegas Valley Water Dist.	13424	.....	59.000	43,000
Maganese, Inc.	15571	.....	2.000	1,448
E. L. Cleveland	16489	.....	3.000	1,384
City of Henderson	16577	.....	34.500	24,971
River Valley Resort, Inc.	16822	.....	3.000	687
Totals			163.500	116,365

These appropriations are in good standing.[1]

In 1958, to-wit, on February 21, 1958, the Stauffer Chemical Company, National Lead Company and American Potash and Chemical Company, filed applications to appropriate 66,843 acre feet of water from Lake Mead for future industrial uses at Henderson. The names of the appropriators and the amounts appropriated are:

Applicant	Application No.	C.F.S.	Acre feet
Stauffer Chemical Co.	17494	13.270	9,589
National Lead Company	17495	65.760	47,523
American Potash & Chemical Co.	17496	13.464	9,731
Totals		92.494	66,843

[1]Tr. 16,330–16,334; Nev. Exs. 35 to 43, incl.; Tr. 16,331; Nev. Ex. 57, Tr. 16,354.

These applications for appropriation are in good standing.[2]

On March 5, 1958, the Colorado River Commission of Nevada, acting for the State of Nevada, filed on behalf of the people of the State of Nevada in trust seven applications to appropriate a total of 475,100 acre feet of water from Lake Mead for industrial, domestic and municipal, and irrigation uses for future use in Las Vegas Valley, Eldorado Valley, California Wash, Apex Dry Lake, Mormon Mesa, Moapa Valley and Fort Mohave. The application numbers and the amount applied for under each application are:

Application No.	Amount applied for (acre feet)
17500	225,000
17501	75,000
17502	100,000
17503	25,000
17504	25,000
17505	3,100
17506	22,000
Total	475,100

These applications for appropriation are in good standing.[3]

V.

PRESENT AND FUTURE INDUSTRIAL GROWTH IN CLARK COUNTY AND WATER REQUIREMENTS

There are a number of factors which have contributed to the phenomenal growth of the Las Vegas area. Its growth initially started with the construction of the San Pedro-Los Angles and Salt Lake Railroad which is the main line of the Union Pacific

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[2]Tr. 16,334–16,336; Nev. Exs. 44, 45, 46, and 47; Tr. 16,336; Nev. Ex. 57, Tr. 16,354.

[3]Nev. Ex. 49 to 56, incl. for iden., Tr. 16,352.

between Los Angeles and the East. Important factors were the construction of Hoover Dam with resulting cheap power and ample water. Electric power made possible the development of the major industries at Henderson and additional ample power is available through the thermal generating stations. Natural gas is also available. The third factor was the government installations including Nellis Air Force Base, the Lake Mead Base, Atomic Energy installations, and the Basic Magnesium Project which was subsequently superseded by the Basic Management, Inc. industries at Henderson. Other factors are the tourist travel and recreational facilities. Las Vegas has become one of the great live-entertainment centers in the country and thousands of visitors are attracted there annually. Finally since World War II there has been a trend toward desert living. Air conditioning has made desert living attractive and comfortable and there are a number of large cities which have grown rapidly with adverse summer climates including Tucson, Phoenix, and Palm Springs, California.[1]

Industrial Growth Since World War II.

It is a matter of common knowledge that the industrial growth in the Las Vegas area since the beginning of World War II has been phenomenal.

While there has been some mining in the area, the major industrial growth commenced at the beginning of World War II. Basic Refractories, Inc. negotiated with the Defense Plant Corporation for the production of magnesium to be used principally in fire bombs. Basic Refractories, Inc. controlled large magnesite deposits in central Nevada. The Basic Magnesium plant was commenced in September, 1941, and the first magnesium was produced in September of 1942. In the fall of 1942

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[1]Tr. 16,562–16,563.

Anaconda Copper Company replaced Basic Refractories as the managing and operating agents for the Basic Magnesium plant. The peak of production was in the summer of 1943. In the spring of 1944 cut-backs were ordered and on November 15, 1944, production of magnesium was concluded. During this period, 165,000,000 pounds were produced at Henderson making it the largest magnesium-producing plant during World War II.

The approximate cost of the plant was $135,000,000. The following year the War Production Board felt that the facilities should be kept in operation and the Stauffer Chemical Company leased part of the plant and continued the production of chlorine and caustic soda. Also the Navy Department entered into an agreement with Western Electrochemical Company to convert one of the 10 electrolytic metal buildings for the production of chlorates and perchlorates. In 1947 the plant was declared surplus. In April, 1948, the State of Nevada purchased the plant from the Federal Government and took possession. From April, 1948, until 1951 the Colorado River Commission of Nevada leased the remainder of the plant. The National Lead Company leased a large part of the buildings to join with the Allegheny Ludman Steel Corporation to form Titanium Metal Corporations of America. Also Combined Metals Production Company secured facilities and constructed two large electro furnaces for the production of ferro manganese and the U. S. Lime Products Corporation converted existing kilns to calcine lime and installed a hydrating plant. In 1952 the five companies negotiated with the State of Nevada for the purchase of facilities and formed Basic Management, Incorporated, to take over the residual assets and to own and operate the facilities. The townsite was sold to the residents in 1951 and 1952 and incorporated into a second-class city on June 8, 1953.[2]

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[2]Tr. 16,632–16,636.

These industries were all in production in 1958. The Stauffer Chemical Company is producing chlorine and caustic soda. The Western Electrochemical Company which has been purchased by American Potash & Chemical Company produces perchlorates and electromatic manganese principally. It is the only major producer of ammonium perchlorates in the United States today. In view of the missile program it has a great potential future. The Titanium Metals Corporation owns approximately one-third of the plant area and their product is being used in the missile program and related fields. The price of titanium has gone from $250 pound when the plant first started producing titanium to $2.25 per pound, all in about 7 or 8 years. The United States Lime Production Corporation produce their own products locally and calcine lime for steel and agricultural industries in Southern California and also hydrate lime for the construction industry, a large portion of which goes to the Southern California market. Over the years they have averaged about 290 cars per month leaving the Henderson plant.

All of these industries are expanding users of Colorado River water.[3]

Another major industry in the Henderson area is the Manganese, Inc. mines located 7 miles northeast from Henderson from which up-graded manganese is shipped for the steel industries and for the strategic stockpile for the Government. Another major operation is Pabco, Incorporated, which has some gypsum deposits which are mined and the raw gypsum is ground and screened and shipped to California where it is made into wall board for the construction industry. The average annual employment for the Basic Management, Inc. industries has been 2,500 people during the past 5 years and the average payroll in

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[3]Tr. 16,642.

excess of $12,000,000. The combined value of products produced exceeds $100,000,000 a year.[4]

Water from Lake Mead is supplied to these industries, and to Henderson, by a 40-inch pipeline 15 miles long with a present capacity of 67.7 second feet or 43.7 million gallons per day. This would be equivalent to about 50,000 acre feet per year. Not all of this water is available for use for industry and municipal use in the Henderson area. Under contractual arrangement between the Las Vegas Water District and Basic Management, Inc., the District has capacity rights up to the year 1990 for 15,400 acre feet annually. Basic Management, Inc. is also obligated to deliver up to 5,000,000 gallons per day to the City of Henderson but in the summer months has furnished as much as 8,000,000 gallons per day. In 1956 and 1957 water meters were installed in Henderson. The average per capita use in 1956 was 325 gallons per day. The City of Henderson used 4,370 acre feet in 1956. Manganese, Inc. also has a tap on the 40-inch pipeline at the Manganese plant and during 1956 was delivered 2,317 acre feet.[5]

The amount pumped from Lake Mead through BMI facilities has fluctuated extremely from 1942 to 1956. In 1943, 16,977 acre feet were pumped during the time the Manganese plant was in full operation. This dropped off sharply in 1945 after the curtailment of the production of magnesium during the period before new industries came into the area and reached a low of 4,512 acre feet in 1949. As the new industries came into operation it has now steadily expanded. In 1956, 21,700 acre feet were pumped. Of this amount 15,600 acre feet were actually used by the BMI industries.[6]

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[4]Tr. 16,637–16,646.
[5]Tr. 16,646–16,649.
[6]Nev. Ex. 502, Tr. 16,648.

Future Industrial Growth.

The Las Vegas area will experience a tremendous industrial growth within the next 40 years. There are a number of factors which lead to this conclusion. The availability of power and water which attracted the existing industries will continue to attract other industries. More specifically, Southern Nevada enjoys the same climate and natural attractions which have led to large industrial growth in cities such as Phoenix and Tucson. In addition to the natural attractions of the desert as an ideal living area, there is sunshine 83 percent of the time and this is an important factor. This has a direct effect on construction costs, lost time due to inclement weather, and production of products which are sensitive to humidity. It is also ideal for outside storage which is a big economic factor.

Another factor is the availability of land. Large areas of land situated in remote areas yet having all the requirements for basic industries is an important factor. There are few areas available which offer all of the prerequisites for industry at a nominal cost and without being in a congested area as does this area. The already crowded condition in Southern California, coupled with the smog and water pollution problem, indicates an inevitable dispersal out of that area.

The accessible ores and minerals also will have an important effect on the industrial growth of Southern Nevada. As the population of Southern California and the Southwest continues to grow the 290 miles to Los Angeles becomes less important. There is now being shipped from Southern Nevada such relatively low cost items as ore, silica sand, stone and rock to the Los Angeles area. As manufacturing concerns produce products of relatively higher value to their weight, distance becomes less important. Adequate transportation facilities are already available in the area and can be readily expanded to meet future needs. Rail

service is provided by the main line of the Union Pacific Railroad Company. There are at least 15 trucking concerns operating in the area including several intercontinental lines.

Las Vegas is the focal point of air transportation in the Southwest. Three major air lines and two feeder lines serve Southern Nevada and make it easily accessible to the financing and manufacturing centers of the United States.

Adequate utilities are available. The area is served by progressive public utilities which insure adequate supplies of natural gas and electric energy at moderate rates. Both the electric and gas utilities have recently completed large expansion programs and have projected programs which will provide adequate service to take care of future growth.

Southern Nevada is attractive to labor supply. The general attractiveness of the area, and particularly Nevada's climate, has proved a strong attraction for bringing workers into the area. This is borne out by the fact that 80 percent of Nevada's increase in the past few years has resulted from immigration rather than from natural increase.

The tax and corporate laws of Nevada are attractive to industry. There is no state income tax and the property tax is considered the basic source of revenue for government functions. Nevada is the only state that has no inheritance or estate tax. Nevada has also recently enacted a free-port law which makes it an ideal location for the warehousing, the assembling and the serving of the West Coast market.

With respect to the type of industries which may be reasonably expected to locate in Southern Nevada, the most promising are made up of those concerns planning to serve the Southern California market. The most logical are those which may not want to locate in Southern California because of limitations on the availability of land, congestion, and air pollution. In Southern

Nevada industries with smog-producing operations can be so located as to take advantage of prevailing winds and keep living areas free of the nuisance. Also defense industries who must take into consideration dispersal because of possible air attack will find Southern Nevada an ideal location. The Department of Defense has designated Southern Nevada as an acceptable area for the dispersal of defense industries. Specifically, the most promising industries would be the chemical industries. There are now a large number of chemical products being produced and these chemicals and the mineral resources deposits provide the basis of a substantial expanding chemical industry.[7]

There are also good prospects of industrial development of the mineral resources of the area. There is a potential both in ferrous and nonferrous metals in the area. The suitability of Southern Nevada for steel mills seems particularly well adapted. The principal ores used in the manufacture of steel are available in the immediate area within economical shipping distance. There are large quantities of limestone that are used in the steel industry and substantially large coal reserves in Southern Utah. There are also locally basic materials for cement and cement products, gypsum products and glass products.[8]

Future Water Requirements for Industrial Purposes.

A conservative estimate of future water requirements for the present industries at Henderson by the year 2000 would be 90,000 acre feet. The major increases will be by American Potash & Chemical Company from a present requirement of 1,535 acre feet to 15,350 acre feet; Stauffer Chemical Company with a present requirement of 3,690 acre feet to 15,800 acre

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[7]Tr. 16,653–16,662, 16,571–16,572, 16,898–16,912, 17,072–17,087.

[8]Tr. 16,714–16,736.

feet; and Titanium Metals Corporation with present requirement of 7,700 acre feet to 56,000 acre feet. These are realistic estimates. Each of the companies have made estimates based upon their present expanding programs.[9]

It is conservatively estimated that new industries will use 47,500 acre feet by the year 2000. This will be in addition to the 90,000 acre feet needed for existing industries, making a total of 137,500 acre feet needed for industrial use by the year 2000.[10]

In addition, at least 37,000 acre feet of water from Lake Mead will be needed for thermal power cooling purposes by the year 2000. The use of power in Clark and Lincoln Counties has increased tremendously during the past 20 years. In 1937, 26,000,000 kilowatt hours were used. In 1957 there were 1,419,-000,000 kilowatt hours used, broken down into the following categories:

Residential: 318,600,000 kilowatt hours.
Commercial: 287,900,000 kilowatt hours.
Industrial: 735,200,000 kilowatt hours.
Miscellaneous: 77,400,000 kilowatt hours.

The increase has been steady except for the accelerated use during 1943–1944 when the Basic Magnesium Project was in full operation.[11]

It is estimated the power requirements for Clark and Lincoln Counties for the year 2000 will be 13,000,000,000 kilowatt hours. This was arrived at in two ways. The first one, a factor in percentage increase annually, starting in 1957, was applied to each category of use, to-wit: 6 percent annual increase to residential, 6 percent annual increase to commercial, 8 percent annual

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[9]Nev. Ex. 504, Tr. 16,652, Tr. 16,651–16,652, 17,082–17,083.
[10]Tr. 17,082–17,083.
[11]Nev. Ex. 301, Tr. 16,513 and Nev. Ex. 304, Tr. 16,520.

increase to heavy industry, 8 percent to light industry, and 4 percent to miscellaneous classifications. In the second method, growth factors by classifications, using the same classifications that were used in the first were applied to the 1,415,000,000 kilowatt hours used in 1957. With respect to residential, assuming a six-fold increase in population by the year 2000, the factor of 12 is applied to the 319,000,000 kilowatt hours used in 1957, making a total use of 3,744,000,000 kilowatt hours. The growth factor of 12 was used for commercial use, 3.6 for heavy industry, 27 for light industry, and 3 for miscellaneous, making a total use by the year 2000 of 12,932,000,000 kilowatt hours.[12]

Power for future requirements for Clark and Lincoln Counties must come from thermal sources. There is no evidence that any further hydro sources will be available to the State of Nevada from the Colorado River. Approximately 12,000,000,000 kilowatt hours of the 13,000,000,000 kilowatt hours which will be required by the year 2000 must come from thermal sources.[13]

Approximately 37,000 acre feet of water from Lake Mead will be required for cooling purposes based upon an anticipated thermal development of 12,000,000,000 kilowatt hours by the year 2000. This is based upon the present rate of 1 gallon per kilowatt hour generated which is now being used by the Southern Nevada Power Company in their existing plants.[14] This 37,000 acre feet, together with the 137,500 which will be needed for existing and new industries, makes a total of 175,000 acre feet which will be needed for industrial uses. The estimated return flow will be 78,500 acre feet so that the net consumptive use for industrial uses by the year 2000 will be 97,000 acre feet.

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[12]Nev. Ex. 307, Tr. 16,536, Tr. 16,529–16,538.
[13]Tr. 16,525–16,526, 16,536–16,537.
[14]Tr. 17,083–17,084, 16,537–16,538.

VI.

AVAILABILITY OF LAND IN CLARK COUNTY, NEVADA, FOR INDUSTRIAL AND SMALL HOMESITE TRACT DEVELOPMENTS, AND WATER REQUIREMENTS

There are many large areas in the general vicinity of Las Vegas which are ideally situated and suited for industrial sites and small homesite tracts. The principal areas are Las Vegas Valley, Apex Dry Lake Valley, California Wash, Mormon Mesa, certain areas in Moapa Valley, and Eldorado Valley.

Soil surveys and land classifications based upon those surveys have been made in these areas. The land was classified into Capability Classes I, II, III, IV, VII and VIII. The first four are generally considered to indicate lands suitable for farming. Classes I, II and III, when properly managed, are capable of producing all climatically or adapted crops indefinitely in continuous rotation. Class IV is poorer land usually utilized in the production of hay or pasture when the land can be irrigated easily and water is plentiful. It ordinarily is not recommended for commercial irrigation. Capability VII is a range land classification and would be suitable for industrial sites or small homesite tracts. Class VIII is rougher, has little usable forage, and has substantially no range value, but to a more limited extent, would be suitable for industrial sites or small home sites.[1]

Referring first to Las Vegas Valley, for the purpose of the soil survey, it is the area surrounding the City of Las Vegas comprising 213,000 acres below the 2,500-foot contour and being appurtenant to the cities of Las Vegas, Henderson, Nellis Air Base, McCarran Air Field and the BMI plants.

The soil survey showed that there were 149,000 acres below

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[1]Tr. 16,408–16,410, 16,437; Nev. Exs. 202, 203 and 204, Tr. 16,420, 16,440 and 16,443.

the 2,300-foot contour which is considered a reasonable pumping lift, being approximately 1,200 feet above Lake Mead. There are 27,000 acres in Capabilities I, II and III and 30,000 acres in Capability IV. The balance, 90,900 acres, are all in Class VIII. Between the 2,300- and 2,500-foot contour the land is similar to the land below the 2,300-foot, the only difference being the pumping lift. A considerable amount of land is being used for small homesites in this area and some of that is Class VIII land.[2]

With respect to the existing expanding small homesite tracts development, there are approximately 30,000 people now living in Las Vegas Valley outside of incorporated towns. Approximately 130,000 acres were in private ownership in 1956 and 86,000 acres of public land have been classified as open for small homesite tracts. The total acreage classified and proposed to be classified to be open for small tract filings is 93,500 acres; there were some 4,650 patents issued up to January 1, 1958, covering 14,000 acres; there is a total estimated number of leases outstanding of 18,000 and an estimated acreage under these leases of 54,000; and there are 8,217 pending leases and sales applications. Approximately 2,000 wells have been drilled on these small tracts alone.[3]

Apex Dry Lake lies several miles northwest of Las Vegas. It is a valley with interior drainage. In general, the soils are rather shallow, and somewhat sandy. In the center of the valley, surrounding a little dry lake, there is some very good soil, that has been classified as I and III which would be very good farm lands. There are 2,900 acres in Class I and 5,000 acres in Class III.

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[2]Tr. 16,437–16,440; Nev. Ex. 203, Tr. 16,440.

[3]Tr. 16,300, Tr. 16,305–16,306, Nev. Exs. 27 and 28, Tr. 16,304, 16,306.

The balance, approximately 17,000 acres, is in Class VII and all below the 2,300-foot contour. This land is too shallow for commercial agriculture but it slopes well and would be desirable for homesite tracts.[4]

California Wash is a broad gentle sloping valley about 25 miles long just to the south and east of Apex Dry Lake. An intermittent stream drains to Muddy River, about two miles west of Glendale. There are 1,500 acres of Class I land, 6,500 acres of Class III, 2,000 acres of Class IV and 55,000 acres of Class VII, all below the 2,300-foot contour. All of the Class VII would be suitable for homesite tracts or industrial purposes.[5]

Mormon Mesa lies east of Glendale and west of Mesquite and about 65 miles from Las Vegas. It lies on both sides of U. S. Highway 91. It is table land, flat and generally sloping. It starts at an elevation of 1,800 feet at the rim on the south end and rises to 2,300 feet north of the highway. Some 4,000 acres have been classified as Class II land suitable for farming. The balance, comprising 82,000 acres, falls in Class VII. The soil is shallow but would be suitable for small homesite tracts or industrial sites.[6]

In Moapa Valley, in addition to the 7,185 acres classified as irrigable, some 20,000 acres have been classified as suitable for small homesite tracts and industrial uses.[7]

The most important area from the standpoint of immediate development is Eldorado Valley. Specific plans have been made

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[4]Tr. 16,427–16,429; Nev. Ex. 202, Tr. 16,420; Nev. Ex. 211, Tr. 16,467.

[5]Tr. 16,430–16,431; Nev. Ex. 202, Tr. 16,420; Nev. Ex. 211, Tr. 16,467.

[6]Tr. 16,432; Nev. Ex. 202, Tr. 16,420; Nev. Ex. 211, Tr. 16,467.

[7]Tr. 16,424–16,427; Nev. Ex. 202, Tr. 16,420; Nev. Ex. 211, Tr. 16,467.

for the development of this area. Eldorado Valley, comprising some 125,000 acres, lies immediately southwest of Boulder City. In fact, Boulder City is in the upper north end of the Valley. Other than Boulder City there is no development in the area at the present time. A number of gold and silver mines in the adjacent Eldorado Canyon district have produced many millions of dollars.

The area is ideally suited for small homesite tracts and industrial site development. Soil surveys disclose that some 19,000 acres in classifications I to IV are suitable for farming, and some 47,000 acres in Class VIII suitable for small homesite tracts and industrial sites. There are many characteristics which make the valley attractive for this type of development. One is the proximity of Lake Mead, a few miles north of the valley, from where water may be obtained at a comparatively low pump lift. Utilities are readily available, including two gas lines and power lines which traverse the valley; weather conditions are ideal for small homesite tracts and for industry; recreation facilities are available at Lake Mead and Lake Mohave. Transportation is also readily available. A railroad traverses the northern end of the valley and there is a major highway traversing the north end of the valley to Boulder City, Southern California and Arizona.[8]

Recognizing the attractiveness of this area for development, the State of Nevada, through its Colorado River Commission, has taken definite steps for its development. On March 9, 1956, Governor Russell made an application to the Bureau of Land Management, pursuant to 43 C. F. R., Section 295.9, for the withdrawal and segregation of approximately 150,000 acres in Eldorado Valley. In his letter of application, the Governor pointed out this area was ideally suited for industrial and homesite tract development, stating:

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[8]Tr. 16,356–16,357.

> "One of the factors involved here is that if the State could obtain the land in the area, and with such land not being encumbered with land entries, the State could then plan an actual industrial development together with homesite and small tract areas."[9]

Following the granting of this application, the Congress of the United States, on March 6, 1958, passed an act (Public Law 85–339) directing the Secretary of the Interior to convey to the Colorado River Commission of Nevada the withdrawn lands in Eldorado Valley upon payment of their appraised value to the Federal Government. The Bureau of Land Management is now proceeding with the making of the appraisal.[10]

Also the Legislature of Nevada in 1957 passed the "Eldorado Valley Development Law" (NRS 321.390 to 321.470) which authorized the Colorado River Commission of Nevada, on behalf of the State of Nevada, to purchase or otherwise acquire from the Federal Government these lands, and authorized the appointment of an advisory group to the Commission to advise and assist the Commission in all phases of planning and development of Eldorado Valley. The Commission is also authorized, with the advice of the advisory group, to undertake such engineering and planning studies and surveys and to take such other action as may be necessary for the development of Eldorado Valley.[11]

The Colorado River Commission in Nevada has had an engineering study made of the proposed development of Eldorado Valley and the feasible location of pipelines and booster pumping stations for the transportation of water from Lake Mead to Eldorado Valley.[12]

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[9]Nev. Exs. 59 and 60, Tr. 16,363; Tr. 16,358–16,363.
[10]Nev. Ex. 61, Tr. 16,363; Tr. 16,360–16,363.
[11]Nev. Ex. 62, Tr. 16,363.
[12]Nev. Ex. 407, Tr. 16,587.

The water system to serve this valley would consist of an intake pumping station located on the south shore of Lake Mead. It would lift water into a reservoir and a booster pumping station would pick up the water at that point and lift it to another booster station. From that point it would be delivered over a pass at an elevation of approximately 2,400 feet to a terminal reservoir located south of Boulder City. From there the water would flow by gravity to the valley area. The water system which has been studied would have a capacity of 25,000,000 gallons per day or 28,000 acre feet per year but it is not contemplated that the initial installation would serve the entire valley at its maximum development. The cost of the initial project is estimated to be $5,100,000. The cost of pumping the water is estimated to be $11.85 per acre foot for power and cost of water, and $16.15 per operation and amortization costs. This would amount to 8.4 cents for 1,000 gallons. This is a reasonable and feasible cost for water for domestic and industrial uses. In the center of Eldorado Valley there is a dry lake. The dry lake area would be reserved as a disposal area by leaching or evaporation of the waste water.

The valley has also been zoned for industrial and small homesite developments.[13]

Cost of delivering water to the Apex Dry Lake Valley area and California Wash and to the North Las Vegas area was also the subject of the study. An estimate was made of the cost of a pipeline which would deliver 25,000,000 gallons per day (or 28,000 acre feet per year) from Lake Mead to a junction point near Highway No. 91, just north of Lake Mead Base. The pipeline would deliver 15,000,000 gallons per day at that point into Apex Dry Lake Valley and 10,000,000 gallons per day along Highway No. 91, past Nellis Air Force Base, to North Las

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[13]Tr. 16,582–16,587; Nev. Ex. 407, Tr. 16,587.

Vegas where it would connect with the Las Vegas Water District System. The elevation of the junction would be 2,175 feet and the summit over which the water would have to be delivered into Apex Dry Lake Valley would be 2,500 feet. It would flow by gravity from the junction to North Las Vegas. The cost of pumping water to the junction would be approximately $9.77 per acre foot for power and cost of water, and approximately $22.53 for operation and amortization of the project for a total cost of $32.30 per acre foot. The cost of pumping from the reservoir at the junction to the Apex Dry Lake Valley would be $4.88 for power and cost of water, and approximately $8.20 per acre foot for operation and amortization for a total of $13.08 per acre foot. The total cost, therefore, would be $45.38 per acre foot which is equivalent to 13.6 cents per thousand gallons. This is a reasonable and feasible cost for industrial and municipal use. After reaching Apex Dry Lake Valley, the water would flow by gravity to the California Wash area.[14]

The consumptive use requirement for small homesite tracts would be 5 acre feet per acre. Diversion requirement would be the same. There would be no return flow. In summary, 98,900 acres have been classified in Classes I to IV with a net usable acreage of 79,100 acres. A total of 324,000 acres have been classified as Classes VII and VIII with a net usable amount of 129,720 acres or a total of 208,820 acres of usable land. The consumptive use requirement for this acreage would be approximately 1,000,000 acre feet. This is exclusive of the land classified as irrigable for commercial farming in the Colorado River Basin in Nevada.[15]

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[14]Tr. 16,588–16,592.

[15]Tr. 16,458–16,459; 16,461–16,463; 16,466; Nev. Ex. 211, Tr. 16,467.

VII.

POPULATION FORECAST FOR CLARK COUNTY BY THE YEAR 2000 AND FUTURE MUNICIPAL AND DOMESTIC WATER REQUIREMENTS

The Colorado River Commission of Nevada retained the internationally famous engineering firm of Tippetts-Abbett-McCarthy-Stratton of New York City to make a study with respect to the future economic growth of Clark County with resulting water requirements, including a population forecast to the year 2000. This firm was eminently qualified to make this study.[1]

Population Forecast to the Year 2000.

The year 2000 is a reasonable date upon which to base a population forecast. The population forecast can be made with reasonable accuracy for a period of at least 40 years.[2] A sound and reasonable forecast for the population of Clark County by the year 2000 is 600,000.[3]

This is a conservative estimate. During the past 97 years while the population of the Continental United States grew about 5½ times, the population of the eight Mountain States increased 36 times and Nevada has increased almost 39 times. Its population has grown 66.6 percent since 1950. Its population in 1950 was 160,000 and its population in 1957 was 267,000. Nevada's rate of growth is steeper than the United States, the Mountain States or the Western States. During the past 7 years it has grown faster than any state in the Union. Its population by the year 2000 is estimated to be 1,300,000. Since 1920 Clark County

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[1]Tr. 16,744–16,748.
[2]Tr. 16,760.
[3]Nev. Ex. 801, Tr. 16,790; Tr. 16,765–16,790; Tr. 17,074.

has shown a steeper rate of increase than Nevada, Arizona, New Mexico or California. It has increased almost 35 times since 1910.[4]

As compared to rapid growing counties with like or similar climate, Clark County has shown a greater rate of increase than Los Angeles, Maricopa (Phoenix), Pima (Tucson), Bernalillo (Albuquerque). The average rate of growth conservatively forecast for Clark County by the year 2000 is slower than the long-term growth experienced by the above-named counties. The forecast for the year 2000 represents a maximum of 5.2 times the 1957 population. This is a slower rate of growth than is shown by the other counties between these same population figures of 115,000 and 600,000. While Clark County is expected to grow from one to the other level of that population in the period of 42 years, Los Angeles accomplished it in about 20 years and Maricopa County is expected to accomplish it in about 35 years. Expressing this comparison in still another way, the projection of Clark County population from 1957 to the year 2000 is at an average annual rate of increase of nearly 3.9 percent, while Los Angeles County covered the same range of population growth at an average rate of more than 8.5 percent per year, and Maricopa is expected to achieve it at an average rate of almost 5 percent.[5]

The average annual rate for the Clark County forecast for the 43-year period from 1957 to 2000 is 3.9 percent or approximately half the average annual rate for the 47-year period from 1910 to 1957. In comparable counties in the Southwest the average annual rate of growth in recent years has been from 4.2 percent to 6 percent.

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[4]Nev. Ex. 801, Tr. 16,790; Tr. 16,779–16,780.
[5]Nev. Ex. 801, Tr. 16,790; Tr. 16,785.

Projection to the year 2000 assumes a continuation of present-day trends; continued technological advances in science and industry, steadily rising production and gradually increased leisure time and expendable income. Moreover, the projection for Clark County was based upon the assumption that its growth would not be hampered for lack of water. In the year 2000 the growth would be rising at a rate of 1.7 percent as compared with the present rate of 10 percent.[6]

It is estimated that the proportion of the 600,000 population forecast for the year 2000 that will be employed in manufacturing industries is 83 persons per 1,000 which would result in a figure of 50,000 employed in manufacturing by the year 2000. This compares with a national average of 100 up to 150 in highly industrialized areas and down to 50 to 60 in lightly industrialized areas. Of this 50,000 which is estimated will be engaged in employment in manufacturing, it is estimated that 7,000 will be employed in the existing Basic Management, Inc. industries; chemical industries 10,000; cement products 1,000; gypsum products 2,500; glass products 1,000; electrical machinery 3,000; fabricated metal products 4,000; instruments and related products 2,000; apparel 2,400; and accessory and miscellaneous industries, 24,000.[7]

Water Requirements for Municipal and Domestic Uses.

Municipal and domestic uses include all uses other than industrial, water for power cooling and water for commercial irrigation. The per capita use per day, for uses other than industrial uses, including power cooling and commercial irrigation, would be 525

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[6]Tr. 16,785.

[7]Tr. 17,077–17,081.

gallons per capita per day, based on a population of 600,000 people by the year 2000 and which would require 353,000 acre feet per year. The present per capita use per day of water for municipal and domestic purposes, or for uses for everything other than industrial and water for power cooling is 370 gallons per capita per day. At the rate of increase of ¼ percent to the year 2000, this would amount to 450 gallons per capita per day. The current average increase of the Southwest at the present time is 1 percent per year. Included in this domestic and municipal use is use on 10,000 acres on small homesite land for suburban areas which will be in tracts from ½ to 1 acre in size. With the 5 acre foot duty per acre on the 10,000 acres, it would mean 50,000 acre feet per year, or 75 gallons per capita per day. This, added to the 450 gallons per day equals the 525 gallons. Some 2½ to 5 percent of the population represented by 200,000 families would live on such small homesite tracts. The estimated return flow from the use of water would be 38,000 acre feet. Therefore, the estimated net use for all domestic and municipal uses, other than industrial and water for power cooling purposes, would be 315,000 acre feet per year for a population of 600,000 by the year 2000.[8]

VIII.

SUMMARY OF PRESENT AND FUTURE WATER REQUIREMENTS FOR THE COLORADO RIVER BASIN IN NEVADA

The existing present diversions of water from all sources within the Colorado River Basin of Nevada is 167,060 acre feet. This is made up of 39,510 acre feet for domestic and municipal

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[8]Tr. 17,082–17,087; Tr. 17,123–17,130.

purposes, which includes 8,810 acre feet from Lake Mead, and the balance of 30,700 from underground water in the Las Vegas Basin. There are diversions for industrial uses at the present time of 16,690 acre feet, which includes 15,560 acre feet diverted from Lake Mead, the balance from ground water. There are 110,868 acre feet presently being diverted for irrigation purposes. Of this amount, 15,180 acre feet are diverted from the underground water basin in Las Vegas; the balance of 95,680 acre feet from the Virgin River, Muddy River, and Meadow Valley Wash.[1]

In determining the estimated net consumptive use requirement for all purposes, the total diversion requirements are first determined and from this amount the estimated return flows are computed and deducted from the total diversion. The result is the net consumptive use from all sources.

The estimated gross diversion requirements for year 2000 for all uses within Clark County is 786,040 acre feet. This is made up of 353,000 for domestic and municipal which includes use on small homesite tracts; in fact, everything other than commercial irrigation and industry; 175,000 acre feet for industrial uses, and 357,540 acre feet for irrigation. With the return flows, the estimated net use for domestic and municipal, including all uses other than industrial and commercial irrigation, would be 315,000 acre feet; for industry 97,000 acre feet and for irrigation 141,650 acre feet, or a total net consumptive use of 553,650 acre feet by year 2000.

This is shown in tabular form as follows:[2]

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[1]Nev. Ex. 808, Tr. 18,834, Tr. 16,832–16,834; Nev. Ex. 504, Tr. 16,652–16,653; Nev. Ex. 29, Tr. 16,314; Nev. Ex. 208, Tr. 16,467.

[2]Nev. Ex. 815, Tr. 17,166, Tr. 17,162–17,166.

Type of use	Estimated present diversion (acre feet)	Estimated gross diversion requirements by year 2000 (acre feet)	Estimated return flow (acre feet)	Estimated net use year 2000 (acre feet)
Domestic and municipal	39,510	353,000	38,000	315,000
Industrial	10,690	175,500	78,500	97,000
Irrigation	110,860	257,540	115,890	141,650
Totals	167,060	786,040	232,390	553,650

Of the 553,650 acre feet of net consumptive use of water in Nevada by year 2000, there should be deducted the average annual replenishment to the Las Vegas ground water basin of 24,500 acre feet which is not Colorado River System water.[3] Of this amount, 9,320 acre feet of ground water will be used for domestic purposes and 15,179 acre feet used for irrigation purposes.[4] This then leaves a net consumptive use of 529,150 acre feet.

In order to obtain the future estimated net consumptive use of water from Lake Mead, the figure of 529,150 acre feet must be further reduced by the net consumptive use on the tributaries. The Upper Meadow Valley Wash has a consumptive use of 21,480 acre feet for irrigation purposes which is not considered as Colorado River System water.[5] Also in the same category is 11,200 acre feet of salvaged water on the Virgin River bottom lands.[6] This reduces the future net consumptive use of water from the Colorado River System to 496,500 acre feet. This figure includes 65,000 acre feet of system water used for irrigation purposes from the tributaries. Therefore, the chargeable future consumptive use in Southern Nevada from Lake Mead

[3]Nev. Ex. 33, Tr. 16,322; Tr. 16,699.
[4]Nev. Ex. 210, Tr. 16,467.
[5]Nev. Ex. 210, Tr. 16,467; Tr. 16,272–16,288.
[6]Tr. 16,406–16,407.

will be about 431,600 acre feet. The 65,000 acre feet figure representing the future estimated consumptive use of system water from the tributaries for irrigation purposes is derived as follows:

	Estimated future consumptive use (acre feet)	Salvaged water (acre feet)	Lake Mead replacement water (acre feet)	Net consumptive system use (acre feet)
Virgin River	36,496	11,200	----------	25,296
Meadow Valley W.	21,480	21,480	----------	0
Muddy River	52,273	----------	12,696	39,577
Total				64,873 (65,000)

In tabular form, the net consumptive use requirement from Lake Mead for Clark County by year 2000 is as follows:

From Lake Mead (diversion less returns)	
Domestic uses	305,700 acre feet[7]
Industrial uses	97,000 acre feet[8]
Irrigation uses	28,900 acre feet[9]
Total	431,600 acre feet

[7]While the net consumptive uses for domestic purposes is 315,000 acre feet (Nev. Ex. 815, Tr. 17,166), this includes 9,320 acre feet of ground water in Las Vegas Valley which should be subtracted, leaving 305,680 acre feet needed from Lake Mead for consumptive use for domestic purposes.

[8]While the estimated gross diversions for industrial purposes by the year 2000 is 175,500 acre feet, the estimated return flow would be 78,500 acre feet, leaving a net consumptive use of 97,000 acre feet from Lake Mead (Nev. Ex. 815, Tr. 17,166).

[9]The future net consumptive use for irrigation purposes from Lake Mead for the Fort Mohave and Big Bend units ---------- 16,217 acre feet.

(There are two units of the Fort Mohave and Big Bend areas located in the southern tip of Nevada, comprising

A tabulation showing method of determining net consumptive use of water from Lake Mead follows:

4,039 irrigable acres none of which is irrigated now. Water will be available by pumping from the Colorado River. The diversion requirement would be 29,485 acre feet. The percentage of return flow is 45 percent or a total of 13,268 acre feet. The net beneficial consumptive use in acre feet would be 16,217 acre feet. Nev. Ex. 201, Tr. 16,401; Tr. 16,444–16,445, 16,447; Nev. Ex. 207, Tr. 16,451; Nev. Exs. 209–210, Tr. 16,461–16,467.)	
Replacement water from Lake Mead to Lower Moapa Valley	12,696 acre feet.
(It is proposed to pump 12,696 acre feet of Lake Mead water to the Lower Moapa Valley to replace water to be diverted to 3,030 acres of irrigable lands in the Lower Meadow Valley Wash area with a consumptive use of 4.19 acre feet per acre. Nev. Ex. 207, Tr. 16,451. The water need for consumptive use would be 12,696 acre feet. Tr. 16,424.)	
Total future net consumptive use for irrigation purposes from Lake Mead	28,913 acre feet.
While the estimated gross diversion for irrigation in Clark County by the year 2000 is 257,540 acre feet, with a net consumptive use of 141,650 acre feet (Nev. Ex. 815, Tr. 17,166), water for most of the increased irrigation use would not be from Lake Mead. The difference between 28,900 acre feet and 141,650 acre feet or 112,750 acre feet would be irrigation uses from the tributaries Virgin River, Muddy River, and Meadow Valley Wash and pumping in Las Vegas Valley.	

TABULATION SHOWING METHOD OF DETERMINING NET CONSUMPTIVE USE OF WATER FROM LAKE MEAD BY YEAR 2000

Type of use (acre feet)	Estimated present diversion (acre feet)	Estimated gross diversion requirements by year 2000 (acre feet)	Estimated return flow (acre feet)	Estimated net use year 2000 (acre feet)	Estimated net use from Las Vegas ground water basin (acre feet)	Salvaged water on tributaries (acre feet)	Stream system water on tributaries (acre feet)	Estimated net cons. use of water for Lake Mead year 2000 (acre feet)
Domestic and municipal	39,510	353,000	38,000	315,000	9,320	----------	----------	305,680 (305,700)
Industrial	16,690	175,500	78,500	97,000	----------	----------	----------	97,000 (97,000)
Irrigation	110,860	257,540	115,890	141,650	15,179	32,680	64,873	28,918 (28,900)
Totals	167,060	786,040	232,390	553,650	24,499	32,680	64,873	431,598 (431,600)

APPENDIX II

COLORADO RIVER COMMISSION OF NEVADA

538.040 "COMMISSION" DEFINED. As used in NRS 538.040 to 538.260, inclusive, "commission" means the Colorado River Commission of Nevada.

538.050 CREATION OF COMMISSION; NUMBER OF COMMISSIONERS. A commission is hereby created, to be known as the Colorado River Commission of Nevada, consisting of five commissioners: The governor, and four commissioners to be appointed by the governor.

[Part 1:71:1935; 1931 NCL § 1443.01]

538.160 DUTIES OF COMMISSION. The duties of the commission shall be:

1. To collect and arrange all data and information connected with the Colorado River and its tributaries which may affect or be of interest to the State of Nevada.

2. To represent and act for the State of Nevada in the negotiation and execution of contracts, leases or agreements for the use or exchange of power and for the use of electrical generating machinery and power transmission lines both within and outside of the State of Nevada, but solely for use within the State of Nevada, and to present the same to the governor for his information and approval.

3. To represent the State of Nevada in such interstate or other conferences or conventions as may be called for the consideration of the development of reclamation and power projects connected with the Colorado River or its tributaries, or in connection with Boulder Dam or other federally operated dams.

4. To render the friendly cooperation of the State of Nevada to such constructive enterprises as look to the conservation of the waters of the Colorado River and its tributaries and the development of power thereon.

5. To render friendly cooperation to and to negotiate with, cooperate with, and invite industries for the purpose of establishing the same within the State of Nevada.

6. To negotiate with the representatives of other states and the United States in an endeavor to settle equitably and define the rights of the states and of the United States *in the water of the Colorado River and its tributaries.*

7. To make and enter into agreements, compacts or treaties between the State of Nevada and the States of Arizona, California, Colorado, New Mexico, Utah, Washington, Oregon, Idaho and Wyoming, either jointly or severally, which agreements, compacts or treaties, however, will not become binding upon the State of Nevada until ratified and approved by the legislature and governor of the State of Nevada.

8. To report to the governor such measures and legislative action as may be deemed necessary to secure to the people of Nevada all possible benefits from the water of the Colorado River allocated to or contracted by the State of Nevada and the power allocated to or contracted by the State of Nevada to be generated at Boulder Dam or elsewhere within the Colorado River stream system or from any private or federal power development upon other rivers in the western United States for use in the State of Nevada.

9. To cooperate with and to establish, conduct and maintain, in conjunction with other states or federal agencies, power, *water and irrigation projects.*

[Part 7:71:1935; A 1943, 209; 1947, 738; 1943 NCL § 1443.07]

538.170 COMMISSION TO RECEIVE, SAFEGUARD WATER, WATER RIGHTS AND POWER OF COLORADO RIVER.

1. The commission is empowered to receive, protect and safeguard and hold in trust for the State of Nevada *all water and water rights*, and all other rights, interests or benefits *in and to the waters of the Colorado River* and to the power generated thereon, now held by or which may hereafter accrue to the State of Nevada under and by virtue of any Act of the Congress of the United States or any compacts or treaties between states to which the State of Nevada may become a party, or otherwise.

2. Applications to appropriate such waters shall be made in accordance with chapter 533 of NRS and shall be subject to approval by the commission as set forth in NRS 533.370.

[Part 7:71:1935; A 1943, 209; 1947, 738; 1943 NCL § 1443.07]—(NRS A 1959, 555)

538.180 LEASES, SALES AND CONTRACTS OF POWER BY COMMISSION: PROCEDURE; NOTICE AND HEARING; APPLICANT'S BOND.

1. The commission shall hold and administer all rights and benefits pertaining to the distribution of the power mentioned in NRS 538.040 to 538.260, inclusive, for the State of Nevada, and is empowered to lease, sublease, let, sublet, contract or sell the same on such terms as the commission shall determine.

2. Every applicant for power to be used within the State of Nevada shall, before the application is approved, provide an indemnifying bond by a corporation qualified under the laws of this state, or other collateral, approved by the state board of examiners, payable to the State of Nevada in such sum and in such manner as the commission may require, conditioned for the full and faithful performance of such lease, sublease, contract or other agreement.

3. The power shall not be sold for less than the actual cost to the State of Nevada as determined by the Secretary of the Interior of the United States.

4. Before any such sale or lease is made, the same shall be advertised in two papers of general circulation published in the State of Nevada for a period of once a week for 2 weeks; and the commission shall require any person desiring to make objection thereto to file the objection with the secretary of the commission within 10 days after the date of the last publication of the notice. If any objection shall be filed pursuant to such notice then the commission shall set a time and place for a hearing of the objection not more than 30 days after the date of the last publication of the notice.

5. Any such lease, sublease, contract or sale, *either of the water* or power mentioned in NRS 538.040 to 538.260, inclusive, shall not become binding upon the State of Nevada until ratified and approved by the governor.

[Part 7:71:1935; A 1943, 209; 1947, 738; 1943 NCL § 1443.07]

538.190 COLORADO RIVER COMMISSION FUND: DEPOSIT OF REVENUES FROM SALE, LEASE OR USE OF WATER, POWER. All revenues derived from the *sale, lease or use of the water* or power derived from the Colorado River or its tributaries mentioned in NRS 538.040 to 538.260, inclusive, and all revenues which shall become due and owing to the State of Nevada under any such lease, contract or sale, or otherwise, within the Colorado River power and water system shall be received, collected and paid directly to the state treasurer and deposited by him in a fund, hereby created, to be known as and called the Colorado River commission fund.

[Part 7:71:1935; A 1943, 209; 1947, 738; 1943 NCL § 1443.07]

APPENDIX III

PRESENT PERFECTED RIGHTS AS OF JUNE 25, 1929

ARIZONA			
North and South Gila Valleys	(1) [1]	23,900 AF	(Ariz. Exs. 77A, 77B & 186)
City of Yuma	(2)	200 AF	(Ariz. Ex. 190, Tr. 8867)
Yuma Project	(3)	164,700 AF	(Ariz. Exs. 77B & 98)
Federal establishments			
Ft. Mohave Ind. R.		48,208 AF	(Calif. Ex. 3517; U. S. Ex. 1322)
Colorado R. Ind. R.		331,201 AF	(U. S. Ex. 592)
Cocopah Ind. R.		1,372 AF	(U. S. Ex. 1009)
Total		569,581 AF, say 570,000 AF	
CALIFORNIA			
Palo Verde Valley	(4)	120,560 AF	(Calif. Exs. 352 & 356)
Yuma Project, Bard Dist.	(5)	17,000 AF	(Calif. Exs. 375 & 376)
Imperial Irr. Dist.	(6)	2,807,000 AF	(Calif. Exs. 270 & 273)
Federal establishments			
Ft. Mohave Ind. R.		6,849 AF	(Calif. Ex. 3515, 3517, U. S. Exs. 1320, 1322)
Chemehuevi Ind. R.		6,237 AF	(U. S. Ex. 1210)
Colorado R. Ind. R.		27,373 AF	(Report pp. 271, 272; Tr. 14469–14470)
Yuma Ind. R.		25,808 AF	(U. S. Ex. 1121)
Total		3,010,827 AF, say 3,011,000 AF	
NEVADA			
Lake Mead Nat'l. Recreation Area	(7)	2,000 AF	(Report, p. 295)
Ft. Mohave Ind. Res.		6,267 AF	(Calif. Ex. 3517, U. S. Ex. 1322)
Total		8,267 AF, say 8,000 AF	
TOTAL ALL STATES		3,589,000 AF	

[1] Figures in parenthesis, thus (1), indicate footnotes following.

(1) Arizona Ex. 186 shows for North Gila Valley an irrigated area of 1,800 acres in 1924 and 6,332 acres in 1952, with no intervening data. Arizona Ex. 77B, on page 43, shows for North and South Gila Valleys an irrigated area of 6,520 acres in 1929. Arizona Ex. 77A, page 95, shows a consumptive use of 19,685 AF for 5,552 acres irrigated in these valleys. The corresponding consumptive use for 6,520 acres would be 23,100 AF and with the addition of irrigation water used on the non-cropped areas from Arizona Ex. 77A, p. 109, the total would be 23,900. As Gila River is a mainstream tributary in this proceeding, such waters are a part of the mainstream supply.

(2) Yuma in 1929 was pumping from Colorado River (Arizona Ex. 190). The reported use of 260 million gallons for 1930, equal to 800 AF, is also considered applicable to 1929. A consumptive use of 25 percent is here applied.

(3) The Yuma Project in Arizona in 1929 comprised the Yuma Valley with an irrigated area of 43,440 acres and the Yuma Auxiliary Unit on the Mesa with 1,162 acres irrigated (Arizona Ex. 186). The valley area includes the small area of Cocopah Indian lands then irrigated. In 1929 and prior years, irrigation supplies for Yuma Valley and Yuma Mesa were measured at the siphon crossing Colorado River from the California side, with Mesa supplies pumped out of the Valley East Main Canal. Waters not consumed were either returned to the river through wasteways or delivered to Mexico users at the boundary. Such outflows are now fully used by Mexico as part of the Treaty delivery. Considering that Yuma Project reports on irrigated areas, in 1926 and prior years, duplicated double-cropped areas, the irrigated areas for the Mesa and the Valley from Arizona Ex. 77B, p. 43, and the inflows less outflows from Arizona Ex. 98 (U.S. G.S. Water Supply Paper 1313) were:

	1927	1928	1929
Irrigated Area	42,906 Ac.	44,053 Ac.	44,810 Ac.
Inflow less outflow	164,700 AF	152,300 AF	125,200 AF

(4) Cal. Ex. 356 shows a consumptive use of 120,560 AF for 1929 with 32,393 acres cropped. Cal. Ex. 352 shows 1926 with cropped area of 36,100 acres but using relatively less water.

(5) Cal. Ex. 375 shows the irrigated area on the Reservation Division increasing to 1926 and then declining; and with the Bard (non-Indian) District irrigated area 5,404 acres in 1924, and 5,055 acres in 1931. From these data the Bard area in 1929 is estimated at 5,600 acres. Cal. Ex. 376 indicates a consumptive use of 3.10 AF per acre for the Reservation Division, resulting in a consumptive use of 17,000 AF for the Bard District in 1926.

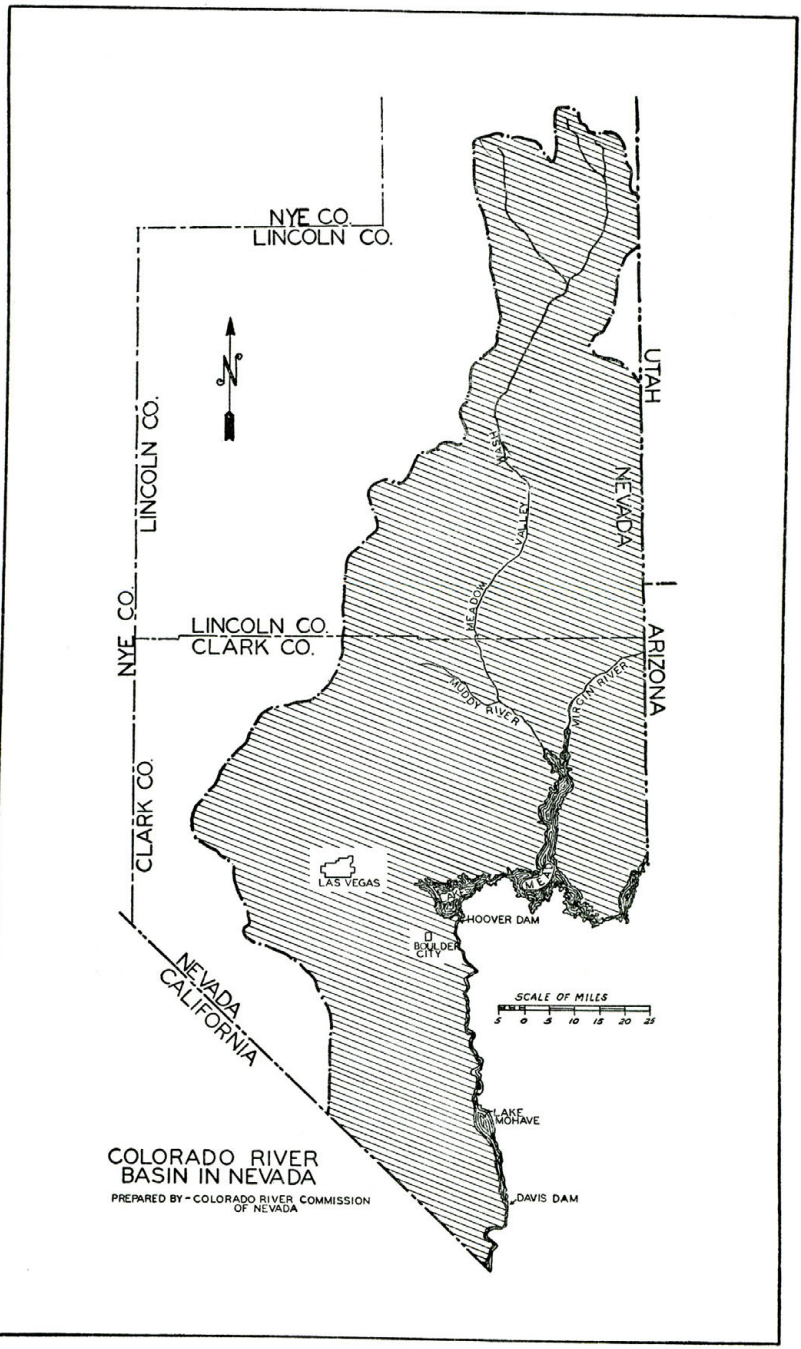
(6) Cal. Ex. 270 shows Alamo Canal diversions for 1929 to be the highest made to that time. Cal. Ex. 273 shows disposition thereof as:

	Units 1000 AF or Acres
Diversion to Alamo Canal at Hanlon Heading	3,423
Loss in main canals	261
Loss—Deliveries to Mexico	616
Total Main Canal Loss	877
Other System Losses Unaccounted For	325
Total System Losses and Unaccounted For	1,202
Waste for System Regulation	423
Deliveries to Users	1,798
Net Average Irrigated	424.1

The designation of Delivery to Mexico *as a loss* is improper for the purpose of arriving at Present Perfected Use as stream flow was sufficient to enable the District to divert more water if desired for its use. The "Main Canal Loss" applies to the Alamo Canal and the two main canals around the border of the District with very little of such loss occurring in the Alamo Canal which is an ancient natural channel of the Colorado River. The District use then becomes the Alamo diversion less deliveries to Mexico, being 2,807,000 AF. Included therein is 423,000 AF of regulatory waste, roughly 12 percent of the total diversion.

(7) The amount indicated is an estimate of foreseeable maximum uses.

APPENDIX IV


NYE CO.
LINCOLN CO.
LINCOLN CO.
NYE CO.
LINCOLN CO.
CLARK CO.
CLARK CO.
UTAH
NEVADA
ARIZONA
MEADOW VALLEY WASH
MUDDY RIVER
VIRGIN RIVER
LAS VEGAS
LAKE MEAD
HOOVER DAM
BOULDER CITY
NEVADA
CALIFORNIA
LAKE MOHAVE
DAVIS DAM
SCALE OF MILES
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