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PROGRESS OF THE METROPOLITAN WATER DISTRICT: RECOLLECTIONS

Robert A. Skinner

Completed under the auspices  
of the  
Oral History Program  
University of California  
Los Angeles

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## TABLE OF CONTENTS

Introduction.....	v
Interview History.....	vii
TAPE NUMBER: One, Side One (May 20, 1966).....	1
<p>Early education--Military service and early employment--Employed by City of Los Angeles--Los Angeles City Bureau of Engineering--Storm drain assessment procedure--Los Angeles County Flood Control District--Employed by Metropolitan Water District--Metropolitan Water District personnel--Water distribution system--Lake Mathews--Jurisdiction of Metropolitan Water District--Design work on Upper Feeder--Problems in constructing Upper Feeder--Work on water distribution system--History of MWD--MWD Act</p>	
TAPE NUMBER: One, Side Two (June 6, 1966).....	24
<p>Robert Diemer and the water distribution system--Lake Mathews--Growth of MWD--Initial cost levies for MWD water--Annexations to the MWD--San Diego County Water Authority--MWD Act--Annexation fees--San Gabriel Valley cities and the MWD</p>	
TAPE NUMBER: Two, Side One (June 23, 1966).....	43
<p>Colorado River Aqueduct--Early California water studies--Central Valley Project--A. D. Edmondston--Landmark bulletins issued by Department of Water Resources--Reorganization of state water resources agencies--California Water Plan--State Water Project--Negotiations for water supply between state and MWD--Governor's Contracting Principles--Costs of state project water--Water supply contract--Controversy over East Branch Aqueduct--Other items at issue in negotiations--California State Legislature and the water project--Litigation over Colorado River water--MWD allotment of state water</p>	
Index.....	71

## INTRODUCTION

Robert Alexander Skinner, son of Andrew Jackson and Helen (Lee) Skinner, was born in New York City on February 24, 1895. After attending New York public schools, he entered Cornell University where he studied civil engineering, leaving in 1917 to enlist in the Navy and was subsequently assigned to the U.S. Naval Academy. He completed the Officers' Training Course at the Academy in 1918 and graduated from the Officers' Training Course at the U.S. Submarine School in Connecticut that same year. Mr. Skinner resigned from the Navy in 1919, and after holding various positions, including one with the Stone and Webster Corporation in California, was employed by the City of Los Angeles in 1924 in what is now called the Bureau of Engineering. There Mr. Skinner rose to the position of Supervising Engineer, working on the design of storm drain facilities, including those for the Sacatella storm drain system in West Los Angeles.

In 1933, Mr. Skinner went to work for the Metropolitan Water District as an Assistant Engineer. He remained with the MWD until 1967, rising to the position of General Manager which he held at the time of his retirement.

Mr. Skinner's main activities with the District concerned the water distribution system which had not yet begun to take shape when he was employed. Mr. Skinner himself played a large part in the preparation of specifications

for the distribution system and in designing the facilities that carry water from Lake Mathews, the terminal reservoir of the Colorado River Aqueduct, to the various jurisdictions of the MWD.

During the decade of the 1950s, the Metropolitan Water District was engaged in negotiations with the state administration for the supply of state project water. Robert Skinner, along with MWD General Counsel, Charles C. Cooper, Jr., was delegated to negotiate final terms for a contract with the Department of Water Resources. The contract was executed by the State and the Metropolitan Water District in November of 1960.

Currently, Mr. Skinner works as a Consulting Engineer and is a member of the Advisory Council of the Water Resources Center of the University of California.

In this interview, Mr. Skinner discusses not only his own activities with the Metropolitan Water District, but also the growth of the District itself and its relationship to state water resources projects.

The interview was conducted under the auspices of the Water Resources Center of UCLA as one of a series dealing with the history of water development in California and the Southwest. Records relating to this interview are located in the office of the UCLA Oral History Program.

## INTERVIEW HISTORY

INTERVIEWER: Eric Petersen. Age 25. B.A., U.S. History.  
M.S., U.S. History, UCLA.

### TIME AND SETTING OF INTERVIEW:

Place: Office of Robert A. Skinner, Metropolitan Water  
District, 1111 W. Sunset Boulevard, Los Angeles, California.

Dates: April 21, 1966; June 6, 1966; June 23, 1966.

Time of day and length of sessions, and total number of  
recording hours: Each session lasted approximately  
from three to four hours, producing one hour of recorded  
tape. The interviews were conducted in the afternoon  
and took place at two-week intervals. This manuscript  
represents a total of three hours of recording time.

CONDUCT OF INTERVIEW: The interviewee was encouraged to  
give a chronological account of his career and to  
comment at length about those projects with which he had  
been most intimately involved. The tape recorder was  
turned off occasionally.

### EDITING:

Editor: Donald J. Schippers, Editor-Interviewer, UCLA  
Oral History Program.

In February 1968, a verbatim transcription of the taped  
interviews was made. Editing of the transcript consisted  
of the introduction of punctuation and the slight  
emendation of syntax. Proper and place names were  
verified by the editor as much as possible. The edited  
manuscript was returned to Mr. Skinner for his review  
and approval on December 15, 1969. The interviewee made  
a careful review of the material, checking the accuracy  
of factual material, supplying additional information,  
and correcting the spelling of those names not previously  
verified.

The index and other supporting documents were prepared by  
Melanie Rangno, Editor, UCLA Oral History Program.

DISPOSITION OF TAPE RECORDINGS AND EDITED TRANSCRIPT:

The tape recordings of the interviews and the edited transcript are in the University Archives, Department of Special Collections, UCLA Library and are available under the regulations governing the use of the noncurrent University Records.

[Photograph of Mr. Skinner is by Galdser Studios.]

TAPE NUMBER: ONE, SIDE ONE

MAY 20, 1966

SKINNER: I was born in New York City, February 24, 1895. I attended public grammar school and high school in the city of New York, Stuyvesant High School, in lower Manhattan, and then I went to Cornell University. After attending Cornell University for three years in the civil engineering college, I entered the Navy early in April in 1917 and, subsequently, was in the submarine service, after having completed an officers' training course at the Naval Academy and also having graduated from the Submarine School at New London, Connecticut. My total service in the Navy was two and a half years. In October, 1919, I resigned from the Navy, at that time being a lieutenant (j.g.).

PETERSON: Was there some reason why you weren't put in some sort of an engineering corps?

SKINNER: The type of service you were assigned to in either the Army or Navy was fortuitous to quite a degree. At that time when I went to the Academy, a certain group was assigned to submarine service. The training course was specifically for line service, not engineering, and candidates did not expect an opportunity to express preference.

PETERSON: I was just curious, because others I've interviewed--[Clay C.] Elder and [A M] Rawn--both wound up in the Engineering Corps in Europe.

SKINNER: Both rendered conspicuous service.

But, anyway, after some time in various employment in the east, including the General Electric Company in Harrison, New Jersey, I came west and worked for the Utah-Apex Mining Company in Bingham Canyon, Utah. I then worked for Stone and Webster Corporation on the Feather River Power Project. The plant I worked in was known as the Caribou Plant on the north fork of the Feather River near Belden, California.

PETERSON: When was this?

SKINNER: The tour of duty I had with Stone and Webster was in 1921. I came to Los Angeles, and after some miscellaneous employment, I was employed by what was then the Engineering Department of the City of Los Angeles, more recently known as the Bureau of Engineering; this was in January, 1924. I was assigned to the storm drain division, and advanced to the position of senior civil engineer in that division.

I think you might remember that this was the time of the first vast real estate expansion in Los Angeles and in southern California, so that the Engineering Department was expanding very rapidly when I was first employed there. But in the early '30s we encountered the famous, or infamous, Depression. The city necessarily was retrenching its forces. The tax structure was very greatly impaired by the Depression, and quite large numbers of the city forces had to be terminated.



I wasn't one of those who were terminated, but at that time, the Metropolitan Water District had established its office at 306 West Third Street in Los Angeles, and in 1932 I applied for work with the District.

PETERSON: What were your functions when you worked for the City Engineering Department?

SKINNER: The designing of storm drain facilities, and related aspects of municipal engineering. The Department of Engineering, or now the Bureau of Engineering, has cognizance of all public works in the city and, of course, it coordinates its work with the jurisdictions that surround the city and also with the jurisdictions that have facilities within the city, such as the Division of Highways of the State of California. This is becoming more conspicuous in recent years with the vast freeway program.

PETERSON: Did you have any major projects--any outstanding projects?

SKINNER: I had a fairly conspicuous part in some of the large storm drain projects, such as the Sawtelle storm drain system (Sawtelle is now known as West Los Angeles). Also, I worked on various components of what was known then as the Sacatella storm drain, the large tributary of Ballona Creek draining the Hollywood Hills and other parts of the city--really a very large project. More recently, the continuation to the ocean of the lower reaches of the Sacatella storm drain system and its main trunk, Ballona

Creek Channel, was taken over by the Corps of Engineers. In those days, storm drains were built by assessment procedure which became so onerous and so controversial that it was largely discontinued so far as the large storm drains are concerned.

PETERSON: Why was it controversial?

SKINNER: Well, you see, the theory of assessments is based on benefit. If a street is paved, the frontage presumptively obtains the most benefit, and as you go further out, the less the benefit is. This in general principle is the basis of spreading the assessment.

In the case of storm drains, the identification of benefit is extremely difficult, because you cannot ascribe it to proximity or frontage. The practice was to assess the entire drainage area so that a resident of a remote hill which happened to contribute to the runoff into the storm drain naturally felt, "Well, I'm immune; I have no difficulties. There's no benefit to me; I'm just as well off without the storm drain, and why should I contribute for these people down in the valley who need this storm drain?"

I can remember hearings before the city council when irate property owners from the assessment district were just about ready to clean up on the engineers, the council and everybody else, because this was a very highly objectionable procedure to a considerable segment of the people. They can recognize benefit from street lighting,

a street improvement, or a sewer improvement, but when it comes to drainage, they resist, and they did resist the assessment procedure.

And another thing about it, when I first worked for Los Angeles, the assessment act improvement activity was quite completely controlled by the city council. It's true that it was necessary to submit petitions and to pass ordinances on which there could be protest, but the protest, if the city council decided to overturn it, could be quite ineffective. After the Depression, in the late 1930s, there was a statute known as the Assessment Limitation Act, and under this act a majority protest is jurisdictional. The city council now has no power to overrule a majority protest, and this was the death knell of large storm drain assessment districts because it gave the property owners total control, you might say, of the proceeding.

In any event, the storm drain work was then taken over largely under bond issues sponsored by the Los Angeles County Flood Control District, and on still larger projects, by the Army Corps of Engineers under congressional appropriations. The Corps of Engineers and the Flood Control

District now are the agencies that handle practically all of the larger storm drain projects. But at the time I worked for the city, these things were largely done either as an adjunct to street improvements or as separate assessment district projects.

PETERSON: Was any consideration ever given to the idea of doing something with this water other than just channeling it out to the ocean?

SKINNER: Oh, yes, of course, and particularly the Flood Control District, as time went on, accentuated the conservation activity much more than in the earlier days. When I say earlier days, I merely mean during my experience with it. The accent was on protecting the people and the land against the ravages of storms and floods. Then the conservation aspect became more conspicuous, and I believe there were amendments to the Flood Control Act which enabled the Los Angeles County Flood Control District to give more of its attention to conservation work. This has been done by the construction of spreading basins by means of which flood control channels can be operated so as to enable water to be diverted for spreading and percolation underground. In addition, many debris basins have been constructed, which also facilitate percolation. This has become an extremely large activity, as you probably know.

In 1925 the Flood Control District did succeed in the amount of \$35 million. With the proceeds of this bond issue, a number of dams were constructed along the south flank of the San Gabriel Mountains and farther west--the most conspicuous of these being the Pacoima Dam, Big Tujunga Dam, the big and little Santa Anita Dams, the big and little Dalton Canyon Dams, San Dimas Dam, among others.

After the expenditure of the proceeds of that particular bond issue, large flood control dam construction devolved upon the Corps of Engineers, although the Flood Control District did build another very large dam, called San Gabriel Number One. That's the main dam in San Gabriel Canyon just upstream from Morris Dam, which latter, by the way, now belongs to the MWD. These two dams are operated conjunctively pursuant to a contract between MWD and the Flood Control District, that is, MWD operates Morris Reservoir at the direction of the Flood Control District, which affords an additional measure of flood control.

But in any event, after working about nine years for the city, I succeeded in obtaining employment with the Metropolitan Water District on March 6, 1933. At that time, the work was well along on the planning and design of the main aqueduct from the Colorado River to the terminal reservoir, then known as Cajalco Reservoir, near Arlington in Riverside County. Construction had begun on the San Jacinto Tunnel, which was possibly the most formidable component of the Colorado River Aqueduct.

My activities with the District, however, were primarily on the distribution system. When the initial bond issue in the amount of \$220 million was adopted in 1931 by the voters of the Metropolitan Water District, the route and general characteristics of the main aqueduct had been nearly

completely established. There had been consultation with very eminent authorities drawn from all over the country, and the consultants had supported the plans of the District engineers. And in that connection, of course, the early talent that the District was able to draw into this activity included some very remarkable people.

The original chief engineer, later general manager and chief engineer, Frank E. Weymouth, had been chief engineer of the Bureau of Reclamation and had made a very famous report on the Colorado River. The chief design engineer, later assistant chief engineer, Julian Hinds, was internationally known for his work in structural and hydraulic engineering. He was the author of numerous papers in the publications of the American Society of Civil Engineers and also of articles in such publications as Engineering News and Engineering Record, now merged as Engineering News-Record. [Mr. Hinds served as general manager and chief engineer of MWD from August 1941 through 1951, and currently is a practicing consulting engineer.] He's an extremely brilliant man and the design of the MWD aqueduct, particularly the dams, is pretty much a product of Julian Hinds' brain. He wrote numerous internal reports for the District in which he treated design and economic subjects. He was famous for his papers on hydraulics, and he also wrote on the economics of aqueduct design, including the treatment of what technically is known as economic slopes--that is, the

relationship between the size and slope of conveyance facilities and the vertical lift at pumping plants. There is a mathematical means of optimizing the relationship between these factors for achieving planned results at minimum cost, and Mr. Hinds had made an outstanding analysis of this problem. The procedure, with some modification, can be applied also to closed conduits, but it's a more intricate problem when applied to closed conduits.

On the electrical engineering, Mr. James M. Gaylord, who previously had been with the Bureau of Reclamation and also with the Edison Company, was primarily responsible for our pumping plant design, which, by the way, was extremely fortunate, because from the earliest operation to this date, the pumping plants have performed with extremely good results. The efficiency has been high; the maintenance of uninterrupted service has been excellent; and the entire main aqueduct has performed in a very effective manner. I would say, in considerable part, this is a result of the work contributed by Mr. Hinds and Mr. Gaylord.

PETERSON: What was Weymouth's role?

SKINNER: Mr. Weymouth, as the general manager and chief engineer, relied upon the technologists for the design. My contact with Mr. Weymouth was far less direct than it was with Mr. Hinds and Mr. Gaylord. As an example of that, for the first six or seven years, I think the only opportunity I had to see Mr. Weymouth was in the elevator.

He ruled with a pretty rigid hand. He was a strong personality--a very hard driver. He had the knack of stimulating people to performance, but he did not attempt to perform technological duties, and I think that's the right way to have an organization run. You need a leader to set the tone, discipline, and to drive people to performance, but if the leader attempts to attend to the technology, he then loses some of his capabilities and propensities for leadership. Of course, I think you would have to say also that regardless of what might be termed the matter of competence, no two men will direct an organization in the same manner, and if one attempted to direct it in the manner of another, he would probably lose a great deal of his effectiveness. Each man is a person unto himself, and he has to follow his own method according to his own characteristics, whatever they may be.

But Weymouth did have a reputation for being an extremely hard driver, a very strong disciplinarian. And certainly in those days (the District having been born in 1928, nearly at the end of the big economic boom of the 1920s, and suddenly being plunged into the Depression at the time the District was employing people) the inculcation of discipline in the ranks was far easier than it is today, when people look upon a coffee break as a divine right. In those days, you probably didn't demur if you had to work weekends and nights with no extra pay. Now, if a man works an hour



overtime he gets probably time-and-a-half, unless his position is elevated to some extent.

PETERSON: You probably considered yourself fortunate to have a job.

SKINNER: Just to have a job, because how many people-- bankers even--were handling shovels and getting blisters on their hands. I don't think that anybody today can visualize the daily scenes that could be observed around 1931 and '32, in the days of the WPA or PWA, and where the urge of the government was to not apply equipment but to have everything done by hand just to provide more people with work--in other words, to scrape slopes with razor blades, as the saying was. That was like the system where you carry dirt on top of your head in a basket rather than using a carryall or a truck. But those were very interesting days, nevertheless.

PETERSON: Do you think Weymouth's role was similar in relationship to the Colorado project to [William] Mulholland's role with the Owens River?

SKINNER: I wouldn't say that the two men were similar. Mulholland ruled with a very strong hand, as I understand, and, of course, I could speak with no real inside knowledge of Mulholland. But I have listened to many comments about Mulholland, and I'm sure that he was a man of very tremendous personality. When I was at the City Hall, Mulholland was the general manager and chief engineer of the Water Department,

and he was held in great awe.

My own superior was Mr. E. A. Tuttle, who had been city engineer of Redlands before he worked for the City of Los Angeles and who became the chief storm drain engineer for the city. I worked under him when I was first employed by the city. By the way, he also built the Third Street Tunnel in Los Angeles. But in any event, Mr. Tuttle was a fairly close friend of Mulholland's, and I recall that he held him in the highest respect.

The influence of Mulholland was very exceptional in the life of the city. Starting as a laborer, he became head of a small private water company before it was absorbed by the City of Los Angeles. Weymouth was a highly educated man to begin with--university training--a man who rose to be chief engineer of the Bureau of Reclamation and had been employed by J. G. White Company in Mexico. Weymouth's engineering activities were somewhat more diverse than Mulholland's and probably more directly associated with engineering as a profession. Mulholland came up through the ranks as an operator and an administrator and executive, and in his later years was looked upon with extreme respect as a professional engineer, even though he had not traveled the pathway usually followed by a professional engineer.

But anyway, when I started with the Metropolitan Water District, the District was beginning to give some thought to the water distribution system. The main aqueduct was

pretty well designed; the construction was beginning; and, strangely enough, or maybe naturally enough, in the engineering work that had been done prior to the bond election in 1931, the accentuation had been on the main aqueduct. The distribution system was a sort of postponed adjunct. Even when I came here, it was nothing more than a very generalized idea.

The terminal reservoir at Lake Mathews was designed shortly after I joined the District, and the problem then, so far as the distribution system was concerned, was that of transporting water from Lake Mathews to the then thirteen constituent cities of the District. There were certain general guidelines, of course, because by that time, the terminal elevation had been established. The original construction of Lake Mathews provided for a spillway elevation of 1,357 feet above sea level, but the aqueduct entering Lake Mathews had an elevation compatible with an ultimate normal water surface elevation of 1,405 feet above sea level. The design of the initial Lake Mathews Dam and Dike (then known as Cajalco Dam and Dike) was such that it was anticipated that these structures would be raised later, and this has actually come to pass.

The design of the entire distribution system, beginning at Lake Mathews and extending to the then thirteen cities, was accomplished after I became employed by the District, and I had a considerable part in that work,

particularly in the structural and hydraulic design of the pipelines and the accommodation of the lines to the various jurisdictions, also the preparation of specifications.

It's of some interest in a situation of this kind, where a special district is responsible for facilities that must cross county and city lines, that there arises a very conspicuous problem of jurisdiction. Under the MWD Act, the Metropolitan Water District is accorded the right to use public streets, with some limitations. There is a limitation that the District cannot totally usurp the use of a street so as to make it ineffective for other necessary uses or to exclude other underground facilities. The District is responsible for any injury it causes to the street improvements, and for their replacement. It is subject to the inspection of the jurisdiction having control over the street, which might be the State Division of Highways or a county or city. The District doesn't have to pay permit fees as such, but it is responsible for the restoration, including the cost of inspection by the city or county or state agency involved.

This became a large problem with the great number of jurisdictions involved, and the somewhat novel situation which developed through building these extremely large facilities for long distances. An example is the upper feeder beginning at Lake Mathews and extending generally north to Fontana, and then west through unincorporated

territory and the cities of Ontario, La Verne, Glendora, Monrovia, Sierra Madre, and Pasadena, to its terminus in Eagle Rock. The extremely large size of this facility, which is a series of pipelines and tunnels, is such that, in effect, it creates a submerged dam across the terrain. Some of the pipe is twelve feet, eight inches, in inside diameter--the outside diameter then being nearly fifteen feet. And when a facility of this type is buried in the ground, particularly if it is built in advance of other facilities, such as sewers, storm drains, telephone conduits, water mains and so on, they either have to cross over it in limited space or they have to be installed in extremely deep trenches to go under it. This is not an extreme problem in the case of water mains, telephone lines or gas mains, or a number of other utilities--oil lines and so on--but, in the case of sewers and storm drains, which do not admit of what we might call syphon-type construction or sags in their vertical alignment, it does mean a very serious problem.

We attempted to coordinate with all the jurisdictions, including federal and state authorities, the various flood control districts, sanitation districts, cities, counties, and so on, but it was not possible to predict the future requirements of all the various types of improvements, so there has been a constant recurrence of the necessity to relocate segments of the MWD system. This has become one

of the conspicuous activities, because if a trunk sewer, storm drain, flood control channel, or freeway is superimposed on all the other improvements, then something has to give way. And, of course, usually the freeways can't give way. They are dominant. Trunk sewers also have dominance, as well as storm drains and flood control channels, so the Metropolitan Water District must accommodate to these.

Of course, the expense is usually borne by the agency that requires the relocation, but not in all cases, because MWD uses streets subject to the jurisdiction of the authorities controlling them. So if MWD must relocate one of its facilities under conditions where the improvement is sponsored by the jurisdiction having control of the streets, then MWD generally must yield at its own expense. But under the Burns-Porter Act, if MWD is required to relocate on account of a freeway requiring the space, then MWD is reimbursed. Generally speaking, this applies also to an MWD relocation to accommodate a flood control channel, and if the MWD right-of-way is one of property right rather than a permit for use of a street, then, of course, the expense has to be borne by the agency that requires the relocation. But these are more or less incidental things.

The first large task that I was engaged in after beginning work with the District in 1933 was the design of

the facility we call the Upper Feeder. The word "feeder" is a rather peculiar term, but, in our parlance, the term is used to denote a very large water main; in other words, a transmission facility rather than one which might bring water to the ultimate consumer. This very large conveyance facility that we call the Upper Feeder diverts from Lake Mathews by means of a headworks in which the hydraulic energy derived from the water surface elevation in the reservoir, whatever it may be at a given time, is dissipated in a valve structure, which discharges into a forebay. This forebay provides a controlled water surface which affords suitable conditions for entrance into the Upper Feeder pipeline. The pipeline, as I mentioned before, goes north to Fontana; it crosses Arlington and the Pedley Hills and turns west in Fontana, ultimately terminating at a very large control tower in Eagle Rock. From that point on, under the designation Santa Monica Feeder, it extends through Glendale, Burbank, portions of Los Angeles, and Beverly Hills to Santa Monica to serve those cities, all of which are constituent municipalities of the Metropolitan Water District.

The initial system went into operation in June of 1941, although some of the member cities didn't have access to MWD water until about August of that year. The design and construction of the first development of the distribution system took place between 1933 and 1941.

PETERSON: What were the major obstacles you ran across in constructing this feeder line, either legal or technical?

SKINNER: If by the term obstacle, you mean problem, there were many fairly conspicuous problems. Structural design of pressure pipe of such large size was in a formative stage at that time. The jointing problem also was conspicuous. The so-called lead-and-steel lock joint had been developed and was coming into fairly wide use and most of the joints in the pressure pipe were made by this means. The steel rings, properly shaped to provide a groove for caulking with lead, are built into the ends of the reinforced concrete pipe. They are welded to the reinforcement steel, or if there is a steel membrane in the pipe, they are welded to the steel membrane. Then water tightness is achieved by caulking with lead in the annular space between the spigot ring and the bell ring. Subsequent to about 1941 the use of lead as a caulking material was discontinued, and rubber gaskets were used instead. They are made of synthesized rubber and not 100 percent natural rubber. The synthetic rubbers are more lasting than natural rubber, and the material is very carefully compounded to assure long life. From 1940 to the present time, the lock-joint pipe has been jointed exclusively with rubber gaskets rather than caulked lead. So I think the jointing problem could be called a conspicuous problem.

So far as obstacles are concerned, of course, acquisition



of right-of-way is always an obstacle. People don't want their land severed by large facilities of this kind, and it was necessary to acquire rights-of-way through urbanized areas (in some cases buying houses and removing them), as well as through many agricultural areas, citrus orchards particularly. Fortunately, it was possible to build a large portion of the Upper Feeder westerly from Glendora in tunnel, and this is optimum, because not only does it involve much less disturbance of the population, but also it is relatively immune (in our case so far, totally immune) to the necessity of relocation because of interferences. The tunnel is reasonably deep underground and doesn't present an interference to subsequent construction of the other types of improvement that I have mentioned.

PETERSON: The tunnel goes under mountains.

SKINNER: Beginning in Glendora, the tunnels go through the south flank of the San Gabriel Mountains (I'm not talking about the future system expansion for distribution of state project water which is an entirely different story). What we might call the rock tunnels of the mountainous areas traversed by the Upper Feeder terminate west of Monrovia. Then through Sierra Madre and through Pasadena we do have tunnels, but they are in alluvium. This also turned out to be a very fortunate selection, because, again, these tunnels have been immune to any need for relocation and they have been maintained with virtually no expense and have been

extremely satisfactory. But, as they are in alluvium, we had to reinforce them throughout with steel to withstand the internal pressure. We didn't think the constraint of the overlying material would be dependable as a medium to withstand internal pressure. So these tunnels in alluvium are fully reinforced with reinforcement steel sufficient to resist the entire effect of the internal water pressure. There are also other tunnels in the distribution system in addition to the Upper Feeder tunnels.

Initially, the distribution system consisted primarily of the Upper Feeder extending to Eagle Rock, with its continuation to Santa Monica, together with the Palos Verdes Feeder, which begins at the Eagle Rock control structure and runs south through Los Angeles and through other areas, some unincorporated, and other cities, and continues in a generally southerly and southwesterly direction to a terminal reservoir in the Palos Verdes Hills. This was also completed in 1941 and was part of the original system.

Then there was one other principal facility beginning at the Frank E. Weymouth Memorial Water Softening and Filtration Plant at La Verne. A pipeline extends in a generally southerly direction through portions of Los Angeles County, across the Puente Hills, into Orange County, near Brea, where a 200-acre-foot reservoir was constructed. From that point the pipeline continues southerly, terminating initially

in the city of Santa Ana, but in 1944, within two years after annexation to MWD of the Coastal Municipal Water District in Orange County, this pipeline was extended to the part of the city of Newport Beach known as Corona del Mar.

The beginning of the Metropolitan Water District is interesting. The City of Los Angeles had in 1923 undertaken a survey of a new supply of water from the Colorado River, and it made a filing for the quantity of 1,500 second-feet, or approximately 1.1 million acre-feet a year from the river. Mr. Mulholland had predicted that the Owens River supply would not suffice for very many years in the future, and it was perceived that another major supply would be required. When the city began these surveys in 1923, it was only ten years after the completion of the Owens River Aqueduct. The city presumably could have undertaken the new venture as a city project, but inasmuch as it appeared advisable for a number of reasons, including political factors and the desirability of having a wider support in negotiations with the federal government for an allocation for the Colorado River, the city combined forces with ten other cities in southern California to form the Metropolitan Water District. This was authorized under a general law of the state, the Metropolitan Water District Act, which was enacted in 1927 after an extended period of legislative activity in Sacramento. The initial

attempt in 1925 to enact this law failed, but it was enacted in the next succeeding legislative session.

PETERSON: Why did it fail?

SKINNER: The legislators at the moment were not convinced of its necessity. The inhabitants of a local area do not have plenary power to form a special district. They must convince the legislature of the desirability of a law and obtain its enactment. The first attempt failed, but the Metropolitan Water District Act was enacted in 1927.

The principal author, I believe I'm correct in saying, was W. B. Mathews, who was then special counsel for the Department of Water and Power of the City of Los Angeles. He was assisted very ably by James H. Howard who was then city attorney of Pasadena and who later became the general counsel of the Metropolitan Water District. This law was, I think, very conspicuously the product of the efforts of these two men. Whether elsewhere and under other circumstances this would be the optimum mechanism for importing a water supply, of course, is a debatable issue. However, it was an ideal arrangement for merging the efforts of a number of separate cities, because rather than creating a loose coalition of municipalities that might act cooperatively under some kind of federation agreement, it made a special district, under state law, which would have strong powers of direction. It would have a board of directors, with the power of administering the affairs of the district, and it

would have, very necessarily, the power of taxation and of eminent domain, together with the power to establish rates for the sale of water and to construct works, and the rights to use public streets and so on. All this is covered in the Metropolitan Water District Act.

Two of the original eleven cities withdrew, namely, the cities of San Bernardino and Colton, leaving nine. Then the nine were joined by four other cities, three in Los Angeles County and one in Orange County. The three in Los Angeles County that joined the District in 1931 were Long Beach, Torrance, and Compton; and the Orange County city was Fullerton. This made the roster thirteen, and they have been, almost invariably since that time, referred to as the "thirteen original cities" of the Metropolitan Water District. But more accurately speaking, there were eleven original cities, two of which detached themselves, which is possible under the law, and then four more cities joined the remaining nine. These thirteen were in the District when the original bond election was held in 1931, which was carried by about a five-to-one majority.

TAPE NUMBER: ONE, SIDE TWO

JUNE 6, 1966

SKINNER: During the previous conversation, we discussed location and design of the main aqueduct, and particularly the contribution, in a technological sense, made by the then assistant engineer, Julian Hinds. We also discussed Mr. Gaylord's participation and leadership in the formulation of plans and the design for the main aqueduct pumping plants. I would like to bring into the discussion the work performed by another one of the very capable engineers who were brought together for the purpose of the Colorado River Aqueduct Project, and that is Robert B. Diemer, whose early connection with the work was on the location of the main aqueduct, to which he made a conspicuous contribution.

In the latter part of 1934, Mr. Diemer was reassigned to take charge of the distribution system. Before discussing his work in that connection, it might be well to refer to one or two things relating to the inception of the distribution system for the Colorado River Aqueduct. I mentioned before that the aqueduct terminates at Lake Mathews, a terminal reservoir originally of 107,000 acre-feet capacity, but subsequently enlarged to 182,000. This is the focal point for distributing water to most of the member agencies of the District.

The policy fixed by the board of directors in 1931 in

respect to delivery of water to the member agencies was that the District would provide facilities for delivering water at or near the boundaries of each of the member cities. The member cities at that time were to a considerable extent separated, the District territory not having been coalesced into the virtually complete occupation of the southern California coastal plain, as it is now. This meant that long conveyance facilities would be required from Lake Mathews, the longest distance being all the way to the coast cities, such as Santa Monica, which was one of the so-called thirteen original cities.

The concept for the main trunk of a distribution system, as it was considered in the original investigations, had two main alternatives: one alternative was a direct line across the Santa Ana Valley, which would mean that a great deal of the line would be under rather high pressure. The hydraulic elevation for outflow from the headworks below Lake Matthews is 1,280 feet above sea level, and the service area extended essentially to sea level along the coastal areas. But the Santa Ana Valley is a region of fairly low elevation compared to some of the terrain that had to be crossed between Lake Mathews and the coast, and this meant that a rather high pressure would be involved in the pipeline across the valley.

Thus, a direct route to the coast from Lake Mathews would have involved a long length of rather high-pressure

line; whereas, by traversing the terrain northerly from Lake Mathews, the high-pressure distance could be shortened very materially. High elevation ground could be reached in the vicinity of Fontana and, from there westerly, the feeder line could be located either in the coastal plain area below the foothills or in tunnels through the south flank of the San Gabriel Mountains. In this manner the water could be conveyed at relatively low pressures, making the construction very much cheaper, because the cost of providing structural resistance to high pressures in large diameter pipelines is very great. This was the concept that was finally adopted. The main trunk line was routed northerly from Lake Mathews across the Santa Ana Valley to Fontana and thence westerly to a major control tower in Eagle Rock. From this point, a main feeder extends through the cities of Glendale, Burbank, Beverly Hills, and part of Los Angeles to Santa Monica. Another main trunk was routed southerly through portions of Los Angeles and other cities and unincorporated areas to a terminal reservoir in the Palos Verdes Hills.

This concept was developed by Mr. Diemer when he took charge of the distribution work in 1934, and he also brought about a change of viewpoint in regard to size. The original alternatives were mostly concerned with a conveyance capacity of less than 400 cubic feet per second, or about one-fourth of the District's then total allotment from the



Colorado River, the early need for service being, of course, comparatively small. Mr. Diemer felt that the growth in demand might take place fairly rapidly, and he advocated and obtained approval for the main trunk line, or so-called upper feeder, to have a delivery capability of about half of the main aqueduct capacity. The line as designed from Lake Mathews to La Verne, where the initial water treatment plant is located, has a conveyance capability of 750 cubic feet per second, which is nearly half of the capacity needed to distribute all of the water from Lake Mathews which the District has available at that point from its Colorado River supply.

There were quite a number of locations investigated for the terminal reservoir of the Colorado River Aqueduct. Interestingly enough, these included the Perris Reservoir site which now has become the site of the terminal reservoir for the east branch of the California Aqueduct of the State Water Project. Lake Mathews was well adapted topographically to the construction of large impoundment and was ideal in a geologic sense. The underlying rock complex consists principally of a massive granitic batholith. It is quite highly impermeable, thereby sharply limiting the seepage of water out of a reservoir, and it is extremely stable structurally so it makes a safe location for a dam.

Another location investigated was what has since become Puddingstone Reservoir in the Los Angeles Flood

Control District complex of facilities. This was closer in and had some advantages in that regard, at least so far as the cities that were in the Metropolitan Water District at that time were concerned, but after studying these and a number of other sites, Lake Mathews was chosen as being the most favorable considering all factors. This conclusion was concurred in by the consulting engineers that were retained to pass on the original design and location of the main aqueduct.

The District was formed in 1928 and subsequently had progressed to the point of obtaining approval of a \$220 million bond issue in 1931. It was then composed entirely of incorporated cities. As indicated before, there were thirteen member cities in 1931. The total population of these thirteen cities at that time was less than two million, and their total assessed valuation at the time of the bond issue was about \$2.4 billion. The valuation actually diminished for the next several years because of the deflationary effect of the Depression. The area of the District originally was a little over six hundred square miles.

Now, it happened that the seven-year period, preceding the beginning of service of water in August 1941, was a period of more than normal rainfall, and the demand for supplemental water was minimal at that time. Santa Monica was the only one of the member cities that was in any dire

need for immediate use of the imported supply. This had come about because the quantity and quality of Santa Monica's local supply from wells had become rather seriously impaired by that time. The other cities, although not having another imported supply except the City of Los Angeles, nevertheless had sufficient local resources, principally from the ground water basins and they continued to utilize these local supplies rather than use an appreciable supply of supplemental water from the District. The result was that, during the first decade, the use of the District's aqueduct was at a very minute percentage of its capacity, and the capacity at that time was limited to about 450,000 acre-feet a year as only three of the ultimate complement of nine pumps were installed initially in each of the five main aqueduct pumping plants.

The effect of this minimal use of water was to prevent appreciable revenue from being derived from water sale. The difficulty of establishing a realistic price of water was evident at the time. Had the price been advanced to a point where it was reasonably commensurate with the actual cost of importing the water, the use of District water would have virtually ceased altogether, again, except for Santa Monica which had a real need for the water at that time. So the initial price was artificially low. It was established at \$8 an acre-foot, exclusive of a surcharge for treatment. This low price prevailed for quite a number of years, but

even so, the increase in the use of water was very slow for the first ten years. This led to the major financial support of the District unavoidably being derived from taxation and, as Los Angeles was the principal source of the tax revenues, there was some urge on the part of the directors representing Los Angeles to increase the tax base of the District, thereby spreading the financial burden over a wider base.

This early attempt to obtain annexations to the District was rather unproductive. It was not until the necessity became pressing that annexations really began on a large scale. Disregarding the four cities which had annexed in 1931 and which really are in the category of "original" cities, the first annexation after this early period was in 1942 when Coastal Municipal Water District, comprising an area along the coastline in Orange County, annexed. And this was brought about because the wells supplying the area were in some instances becoming saline, due to the incursion of sea water into the aquifers into which the wells were drilled.

The annexation of Coastal Municipal Water District in 1942 was not followed immediately by other annexations but, in 1946, San Diego County Water Authority annexed to the District, again by the force of very great necessity. The military installation in the San Diego area was enlarged tremendously in World War II and this brought in a great

influx of population and more industries. It also, unfortunately, coincided with the beginning of an extended drought, and it was becoming apparent that the local water supply available to the San Diego area would be insufficient to sustain the civilian population and the indispensable military establishment. So by Presidential Order issued in November, 1944, the Navy started to build an aqueduct diverting water from the Colorado River Aqueduct at the west portal of the San Jacinto Tunnel and traversing southerly to a terminal reservoir known as San Vicente Reservoir which belonged to the City of San Diego. The government had not made arrangements with the Metropolitan Water District for a connection or for a supply of water, but was relying on its war powers to obtain the necessary service.

However, before the first San Diego Aqueduct went into service, it had become apparent that the end of the major part of the hostilities was in sight, and the Navy decided to cancel the construction contracts and to abandon the project. Inasmuch as the civilian needs for the water had increased with extreme rapidity, the San Diego County Water Authority, which had been formed in 1944 for the purpose of obtaining a supplemental water supply for the San Diego County area, negotiated with the federal government and succeeded in reinstituting the construction of the San Diego Aqueduct on the basis, however, that the

San Diego County Water Authority would pay the cost of the work. The contract which was negotiated freed the Authority from the necessity of paying interest on the government's investment, but it did require the Authority to make the payments for reimbursement over a period of thirty years.

The Authority then succeeded in annexing to the Metropolitan Water District in 1946 after a rather long negotiation on terms of annexation. These terms included a provision that Metropolitan would pay half of the true cost of the first San Diego Aqueduct, and the Metropolitan Water District, on the basis of this payment, acquired control of the northerly portion of the line representing the half cost. This portion extends to a point six miles south of the San Diego County line. The San Diego reservoirs were approaching a state of emptiness when the first San Diego Aqueduct went into service in November of 1947, so it turned out to be highly fortunate for that region that the Authority had the foresight to become organized and to contract with the government and subsequently also to annex to the Metropolitan Water District.

The continuation of the drought period then accentuated the need for supplemental supplies. Of course, it had been recognized from the beginning of service by MWD that the cities which were then members should, as a matter of ground water preservation, have begun by taking more of

their requirements from the MWD system rather than continuing to overdraw the ground water resources. But as is usual in a case of that kind, the compulsion of the immediate economic factors prevailed. In other words, the utilization of the cheapest available source and the protection of correlative rights to ground water were the controlling factors and these cities continued to overpump the ground water, even though a supplemental supply was available to them. However, as time went on and the drought in southern California continued, the situation becoming more acute in many areas, it did generate another wave of annexations. The West Basin Municipal Water District including the area generally between the coastline, from El Segundo to San Pedro, and what is known as the Inglewood-Newport uplift, or fault, joined the District. This was not a continuous area; for instance, the cities of Gardena, Inglewood, Hawthorne, and Culver City were not in the original West Basin District, but did join subsequently. Also, of course, territory in the west basin geographical area and already part of Metropolitan, such as in the cities of Los Angeles, Long Beach, and Torrance, was not included in the West Basin District.

The West Basin District annexed in 1948. This was followed in 1950 by the Pomona Valley Municipal Water District (this also is in Los Angeles County) and in 1951 by Eastern Municipal Water District in Riverside County and, again in

1951, by Chino Municipal Water District in San Bernardino County, and then by the Orange County Municipal Water District, which comprises most of the populated area of Orange County not already in the Coastal Municipal Water District.

It's of interest in connection with this particular series of annexations that, prior to the annexation of Pomona Valley Municipal Water District in 1950, the board of directors of Metropolitan, foreseeing that the continued territorial growth of the District was going to seriously dilute the availability of Colorado River water by greatly expanding the service area, became apprehensive about the continued viability of service to the original cities of the District. The effort of the early '40s was to actually encourage annexations to expand the tax base as an ameliorating measure on the economic side. Then in the late '40s, the opposite tendency was quite apparent in the board of directors to declare what you might call a moratorium on annexations, at least until the situation on the Colorado River might be clarified. Even at that time it was becoming apparent that the preservation of California's rights in the Colorado River would be a matter of considerable difficulty.

This apprehension in regard to annexation resulted in a delay in the annexation of these municipal water districts, beginning with Pomona Valley Municipal Water District. But



after considerable discussion and negotiation and, to some extent, indications of intervention by the legislature they were annexed. The legislature has the power to amend the MWD Act and, if it sees fit, to amend it in such a way that the rules controlling annexations would be changed, and possibly even so as to take it out of the hands of the board of directors of the District.

Facing this situation, the District's board of directors then decided to proceed with the approval of these annexations in spite of the apprehension that the available water supply from the Colorado River might be diluted to a point endangering the adequacy of service to the original cities.

We have, then, a series of annexations including West Basin and Pomona Valley Municipal Water Districts in Los Angeles County, Eastern Municipal in Riverside County, Chino Municipal in San Bernardino County, and Orange County Municipal in Orange County. Then a foothill area, again in Los Angeles County, known as Foothill Municipal Water District, annexed in 1953. This was followed in 1954 by Central Basin Municipal Water District, a large district of concentrated population and assessed valuation, generally occupying the lower part of the San Gabriel Valley, that is, the portion of the San Gabriel Valley downstream from Whittier Narrows, together with the southerly portion of the Los Angeles River basin. This was followed also in 1954 by Western Municipal Water District of Riverside County,

ending the series of annexations in the '50s.

There was a lull then for six years in the annexation of unit municipalities to the District. There was a continuing increase in territorial extent of the District, because each one of these municipal water districts, and also the San Diego Water Authority as well as the thirteen original cities, proceeded to annex territory, which had the effect of enlarging the Metropolitan Water District.

There is another factor of some interest here in that, by the effect of the Metropolitan Water District Act itself, the "unit cities," or incorporated cities which as separate units are members of the Metropolitan Water District, have the automatic right of increasing the territorial extent of the District by annexing areas to themselves. They do not need the approval of MWD's board of directors to do this, and the MWD board has no power to prevent the accession to the District of these territories which are annexed to the unit cities. This privilege also extends to the cities in the San Diego Water Authority which are unit members of the Authority. Here again it's a feature of the Water Authority Act which is, to a degree, patterned on the MWD Act.

On the other hand while the municipal water districts which, as separate units, are members of Metropolitan have the power, within the confines of applicable law, of annexing territory to themselves without the consent of MWD, they do not have the power to bring this territory into the

Metropolitan Water District without consent of the District. This enables the Metropolitan Water District to fix terms and conditions which always include payment of an annexation fee.

So the municipal water districts, upon their original annexation, paid a fee which at that time generally was computed on the basis of the hypothetical taxes that would have been levied upon the area for MWD purposes had the area been a part of MWD from its inception. They would pay this amount as an annexation fee, or so-called back taxes. This went through somewhat of a transformation in regard to the interest charges on time payments. At the present time, when the annexation fee is computed on the basis of back taxes, interest is included at 4 percent up to the time of annexation, and if the fee is then amortized over a period of years, interest at 4 percent is charged as a factor in the amortization. So we do have this rather interesting distinction between annexations to cities, which as separate units are members of MWD, and annexations to water districts.

This had been a source of considerable contention in the MWD board, namely that cities had the power of automatic enlargement of the District by annexation to themselves, without power of the District to levy an annexation fee, but it was generally agreed that there was no other practicable course of action. This conclusion comes about

in this way. A municipal corporation, that is, an incorporated city, has its being for a wide variety of purposes. Supply of water may be one of these purposes, but only one of very many. Therefore, the power of annexation vested in an incorporated city could not be impeded merely because that city happens to be a constituent agency of a metropolitan water district.

Now, the question still would remain that it might be possible to prevent the annexed territory, that is, the territory annexed to the city, from becoming a part of MWD without paying an annexation fee. However, if this resulted in member cities growing without bringing the territory into MWD (and recognizing the duty of each city to serve its inhabitants with water), it would be virtually impossible to prevent Colorado River water from being used outside of the territorial limits of MWD. This would be much worse for all concerned than permitting the free or non-free annexation of accretions to incorporated cities. So, on that basis, the Metropolitan Water District board receded from any effort to change this particular aspect of the law.

Beginning in 1960, there was an additional series of annexations. The Las Virgenes Municipal Water District became annexed late in that year. This district is in the west part of Los Angeles County, spanning the Santa Monica Mountains, of course, outside the confines of the City of Los Angeles. Calleguas Municipal Water District also

annexed late in 1960. This is in Ventura County and is the only agency in that county currently in the District. The Upper San Gabriel Valley Municipal Water District annexed in 1963. This brought in virtually the entire remainder of the San Gabriel Valley not already annexed, with the exception of four cities which had formed themselves separately into a municipal water district, ostensibly with the purpose of preventing annexation to Metropolitan. These are the cities of Alhambra, Monterey Park, Azusa, and Sierra Madre, and this situation remains at the present time. That is, these cities, although unavoidably closely associated with the upper San Gabriel Valley in regard to water resource developments, are not parts of Metropolitan. In the meantime, the City of West Covina, which up to recently had not been a part of Metropolitan, annexed concurrently to the Upper San Gabriel Valley Municipal Water District and to Metropolitan, thereby, with the exception of the four cities referred to, consolidating the annexed area in the San Gabriel River basin.

PETERSON: What were the reasons for the four San Gabriel cities not wanting to join the MWD?

SKINNER: Well, it isn't easy to explain attitudes, and possibly this comes about through the fortuitous circumstances involved with the particular people who happen to be in control of the political fortunes of cities at a particular time, that is, the people on the city council,

the water executives and so on within the city. But the situation in the upper San Gabriel Valley is unique. Here is an area which had a bountiful water supply for the population that existed up until quite recently. This area is below the mouth of the San Gabriel River and has a really magnificent water supply dating way back in history but also has an extremely complex situation as to water rights. The drainage area of the San Gabriel River upstream from Morris Dam, which was built by the City of Pasadena but subsequently acquired by the Metropolitan Water District, is about 210 square miles, which is quite an appreciable drainage area. And it includes the area of highest precipitation in this general area. Opid's Camp, for instance, which is on one boundary of this general area, even in this last year [1965-66] had a rainfall of about sixty inches, which is quite extraordinary compared with the general average for the same year in the southern California coastal plain drainage area. So here we had an area that looked upon itself as being very self-sufficient in water supply.

However, trouble began to arise when the lower basin, feeling the pinch of the drought prior to 1965 and also the effects of very rapidly increasing population and continuing overdraft on ground water, began to look to its rights to underground water. This could be made the subject of a special discourse all of itself. But generally, just to mention one aspect of the situation, just because

an area higher up on a watershed has the physical ability to preempt or capture the water before it can flow underground to lower-lying areas it doesn't have the legal right to do so, necessarily. So the lower San Gabriel River basin, that is, the Central Basin Municipal Water District and adjacent cities in the lower basin, became highly restive under this increasing upstream pumping, particularly as water demand in the lower basin was growing rapidly. Also it became apparent that the upper San Gabriel Valley was going to have to do something about supplemental water supply. Litigation ensued between the lower basin interests and those in the upper valley.

The result was the formation of the Upper San Gabriel Valley Municipal Water District. However, this had been preceded by the formation of the San Gabriel Valley Municipal Water District, consisting of these four cities that I mentioned--Alhambra, Monterey Park, Azusa, and Sierra Madre--and they did this as a defensive maneuver or tactic so that they could control their water supply destiny, so to speak, and would not be blanketed into the Upper San Gabriel Valley District, which was sympathetic toward annexing to MWD.

To try to answer the question why these four cities were dissident, that is, were contrary in their views to the rest of the area, it'd be very difficult without again going back to the attitudes of individuals who happened to

be in control. It's possible that the authorities in the four cities thought that financially or economically they could pursue a course of higher advantage by refraining from annexing to MWD, and attempting to exert the maximum autonomy in the local water supply. But anyway, this is the course of action that they have taken.

Subsequently, these four cities, or San Gabriel Valley Municipal Water District, have contracted separately with the state, so if they can survive until the beginning of the delivery of state project water, it's conceivable that they never would become members of MWD. There's probably a change of thinking among some of the controlling elements in these cities, but just how this might develop is not easily predicted at the present time.



TAPE NUMBER: TWO, SIDE ONE

JUNE 23, 1966

SKINNER: In the general course of the studies that led to the creation of the Colorado River Aqueduct Project, the predictions were that the supply made available to the Metropolitan Water District would suffice for the District's service area until about 1980. However, the growth of the District in annexations after 1942, as I believe has been mentioned previously, became very rapid and in the 1950s it became evident that full use of the Colorado River Aqueduct would come sooner than had been previously considered probable.

PETERSON: If the annexations hadn't taken place, would the 1980 prediction have held?

SKINNER: We must bear in mind here that the original territorial extent of the District was only six hundred and some square miles, but now it's over 4,500. So we could say without any question that if the original thirteen cities had remained the extent of the District, then the supply would have sufficed until at least 1980. [We must recognize, however, that if annexations to MWD had not developed in the form of municipal water districts, much greater territorial enlargement of some of the original MWD cities would have occurred than actually has been the case, brought on by the quest for supplemental water supply

as the need became more acute.] In the original thinking, there had been expected a considerable enlargement of the District, but possibly not as much as actually occurred. For instance, it was not thought totally probable that areas in San Diego County would annex. At that time, San Diego had under consideration its own transport of water from the Colorado River, and it was quite doubtful whether San Diego, or any area in San Diego County would annex. Also, the area in Riverside County, organized as Eastern Municipal Water District, which includes portions of the San Jacinto River and Temecula River drainage basins, which annexed in 1951, was not in the earliest concepts thought to be a potential annexation. So I think that the original estimates wouldn't have been too far out of line although, even so, the actual rate of growth in southern California has turned out to be greater than the predictions made at that time. So, it did become evident in the 1950s that the Colorado River Aqueduct was likely to come into full use within a relatively short time, and this brought about some activity on the part of the District's directors in taking steps for additional importations.

At this point, let me turn to the studies that were and had been in progress over a long period of time in the State of California itself. Going way back to the 1920s, we find that the Department of Public Works was conducting early studies of what we might call a California

water plan, involving, in general, the utilization of the available water of California for the possible areas of service, including those that could be identified as areas of deficiency so far as their local supplies were concerned. These studies in particular were consummated under the administration of State Engineer Edward Hyatt, whose report on the State Water Plan, 1930, after nine years of preparation, was submitted to the legislature in 1931. It could be said that these early studies were the genesis of what we now call the California Water Plan.

[In 1933 the legislature adopted the Central Valley Project Act, providing for implementing the initial features of the state water plan in the Central Valley, with financing by means of revenue bonds. These bonds proved to be unmarketable. Subsequently, however, the federal government authorized the project and provided financing under reclamation law. Thus was brought into being the great Central Valley Project of the Bureau of Reclamation, with its array of multipurpose reservoirs, power plants, and transport facilities, by which water now is delivered as far south as Kern County, principally for agricultural use.

Other than the federal CVP, little was accomplished for a number of years in implementing a comprehensive state water plan. In 1945 the legislature directed the State Water Resources Board to conduct a statewide water resources investigation], and the activity became quite a bit more conspicuous around 1951. At that time the then state

engineer, A. D. Edmondston, issued his very well-known report, a landmark report, we might say, on the Feather River and Delta Diversion Projects. The scope of this proposal, which was considered to be the first unit of the general California Water Plan, was more or less similar to the scope of the current State Water Project, but somewhat larger in capability and extent. That is, the aqueduct that was projected by Mr. Edmondston extended practically to the Mexican Border, and involved about 100 more miles than the present extent of the East Branch Aqueduct, which terminates at Perris Reservoir in Riverside County.

Now, between 1951 and 1959, the State Water Resources Board and its Division of Water Resources, followed by the Department of Water Resources (the form of organization was changed in 1956, and I'll explain that a little bit), made massive studies on the entire spectrum of water availability, water utilization, and water planning for California. In this period there were issued three additional landmark bulletins representing this wide-ranging study.

Bulletin No. 1 was issued in 1951 under the title Water Resources of California, and the scope of this bulletin included a recitation of the recorded precipitation, stream runoff, flood flows and their frequencies and water quality conditions throughout the entire state. In other words, this is a compendium of the water resources, the

water availability, in the State of California. Bulletin No. 2 of this very comprehensive series of studies was issued in 1955 under the title Water Utilization and Requirements of California. The scope of this bulletin included the current utilization of water throughout the state for all consumptive purposes and forecasts of the ultimate requirements. I use the word ultimate because it has been used, but I'm not sure that it can be defined in this context. But, in any event, Bulletin No. 2 purported to be a forecast of the ultimate requirements based on the capability of the land to support development. Then, finally, in 1957, Bulletin No. 3 was issued. Now, the first two bulletins had been issued by the State Water Resources Board through its Division of Water Resources. Bulletin No. 3, however, was issued by the Department of Water Resources which had been formed in 1956 by the legislature in a general reorganization of the water resources agencies of the state.

PETERSON: Why was the reorganization necessary?

SKINNER: Well, this goes back to a long series of legislative hearings and other activities. I think that it was to unify the direction of water resource development and to clarify its executive control and its relationship to the legislature. One of the legislators who was very active in this was Caspar W. Weinberger, and there is available a rather complete compendium of the various hearings and

reasons for the reorganization. But in any event, the Department of Water Resources as we now know it was formed. There is no office now known as the state engineer; we don't have an office like that under that titular designation at present. The functions of the previous office of state engineer are now mostly included in the office of the director of the Department of Water Resources who is, at present, Mr. William E. Warne.

Well, Bulletin No. 3 was issued in 1957 under the title The California Water Plan, and this then became the general guideline for future water planning in California. Bulletin No. 3 was in no sense an action report or an attempt to define and project the timing or sequence for construction of works. It was an attempt to identify possibilities, requirements, and a method of fulfilling them, but there was nothing in the report necessarily to distinguish between projects that might be carried through by the federal government, the state itself, or by lesser agencies. The purpose of the plan was to provide a guideline so that the projects which might be subsequently carried out by the various agencies would fit into an acceptable general plan. In other words, it's a planning effort in its own way similar to what we now conceive to be regional or city planning where we attempt to prevent inappropriate development for want of an overall coordinated plan. This was not an attempt to create an overall, appropriately integrated plan for

statewide resource development, that all planning could be accommodated to.

These three bulletins, then, represent a mammoth effort on the part of the state to provide a backdrop for water resource development in California. Now, at the same time that these investigative studies were going on, as exemplified by Bulletins No. 1, No. 2 and No. 3, parallel with that, the plans for the first unit of the California Water Plan were being carried forward. Now, this should be emphasized. When we talk about the present State Water Project or in its former more common term, Feather River Project or Feather River and Delta Diversion Projects, we are only talking about the first unit of the California Water Plan. As a general indication of relative magnitude, the Feather River and Delta Diversion Projects, or current State Water Project, amounts to an estimated total construction cost of something more than \$2.5 billion, nevertheless, this is only a small fraction of the possible ultimate cost of the California Water Plan as a whole. Even projects already identified would exceed say \$15 billion, so this current project should not be considered synonymous with the California Water Plan. It is only the first unit of the plan.

Now, in 1951, on the strength of Edmondston's report, the legislature authorized the Feather River Project and Delta Diversion Projects as the first unit of the California

Water Plan and authorized revenue bonds to finance it. [This legislation had the additional effect of lifting restrictions on the total amount of such bonds which otherwise would have been imposed by the provisions of the Water Code.] Obviously, there would be no market for revenue bonds for a project of this nature, because the initial investment would be extremely large and repayment on the basis of revenues only, without any other guarantee, would not make the bonds attractive for sale. It is possible to sell revenue bonds in a going concern, such as the Department of Water and Power of the City of Los Angeles, where the revenues are predictable, dependable, and the bond market is susceptible of being entered with a revenue bond issue. But a project where no revenues are initially available, where revenues are a future prospect only after the expenditure of vast sums of money to put the project into being and into use, doesn't afford a basis for sale. Of course, nothing happened. In other words, the legislature adopted this authorization and the revenue bond financing was approved, but nothing then happened.

PETERSON: Why were the revenue bonds decided upon as a means of financing?

SKINNER: Well, the legislature, I think, was persuaded to do this inasmuch as there would be no obligation on the taxpayers of the state with such bonds, so the legislature didn't have any great inhibition about doing it. It was



somewhat promotional, maybe, and possibly the administration had caused the legislation to be introduced. In other words, I suppose you could say the legislature would take the position: "This is a necessary project. It's desirable, and if they can sell revenue bonds, why fine." But it happened that they couldn't, and I don't think that most people who had thoroughly studied the subject would have considered that it would be possible to sell revenue bonds. But in any event, the planning was not interrupted. The state administration went ahead and proceeded to refine the plans.

In 1955, the Bechtel Corporation was engaged to make a review report on the project. The report indicated that it was feasible financially and economically, as well as from an engineering standpoint. The planning activity was accompanied by many presentations up and down the state by Bob Edmondston and his staff, and it became quite a well-known project. Presentations were made before the MWD board of directors, who, as I had mentioned previously, were then becoming aware that arrangements to amplify the Colorado River supply were becoming necessary.

Now, in 1959, another very famous landmark bulletin was issued by the Department of Water Resources. This was Bulletin No. 78, under the title Investigation of Alternative Aqueduct Systems to Serve Southern California. A preliminary summary report edition of Bulletin No. 78 was issued in

February, 1959, which in part was the basis for the legislative action which culminated later that year in the adoption by the legislature of the Burns-Porter Act, with the objective of providing funds to assist in the construction of the state water resources development system. Now, the system proposed in Bulletin No. 78, as had been the case with Bob Edmonston's proposed project, had a greater capability than the current State Water Project. The service to be provided was indicated to be adequate until about the year 2020, that is, the capacity of the system was predicated on a target date of 2020.

In the course of the legislative process leading to the enactment of the Burns-Porter Act, a series of estimates was made, and it finally became apparent that the sum of money necessary to create a project of this magnitude would not be tolerable, wouldn't be acceptable to the legislature, so it was necessary to scale it down. So the State Water Project, as described in the Burns-Porter Act, was considered to have a period of sufficiency until about 1990, and the amount of money for bond authorization under the act was \$1.75 billion.

This amount of money, of course, isn't sufficient for the entire cost of the project. There was a very substantial amount of money in what is known as the California Water Fund, derived principally from oil and gas revenues that accrue to the state from leases of state-owned oil-bearing

land. This had grown substantially with the discovery of very large additional quantities along the coast, particularly in the Long Beach-Wilmington area. The amount of such revenues to the state were found to be very much larger than had been estimated previously. So, in effect, a sort of windfall would have developed for the State Water Project had this oil and gas revenue been solely allocated for that use as had been indicated previously. But like any windfall, it becomes too attractive to the legislators to use the money for other purposes, so the amount finally made available for the water project was limited. It currently is limited, I believe, to \$16.5 million a year. It had been limited for several years past to about \$11 million, although there was considerably over \$100 million that had been in the fund and made available for the early part of the construction of the Feather River and Delta Diversion Projects. It was mostly used for such things as railroad relocations, for Oroville Dam, bridges that had to be rebuilt, and other expenses concerned with the Oroville complex.

It should be mentioned here that in all this period throughout the 1950s the District had been negotiating with the state administration, and these negotiations became much accentuated toward the end of the decade, particularly in 1959. The MWD board passed a number of resolutions directed toward expressing the position that the

District would take in contracting with the state for water supply, and as a result of many hearings before both the branches of the legislature, that is, the assembly and the senate, there were issued in January of 1960 what have come to be known as the Governor's Contracting Principles.

Now these were issued under the authorization of Governor Brown and they were intended to define the scope and the nature of the terms and conditions that the state would follow in contracting with water districts and other agencies for service of water from the project. These principles, of course, are in published form; they can be found in many documents, including a report issued in 1960 by the Fact Finding Committee on Water Resources of the California State Senate. This report bears the title of Contracts, Financing, Cost Allocations for State Water Development.

Possibly the most conspicuous of these contracting principles, or terms and conditions, go to the method of reimbursing the state for its expenditures in providing the facilities and constructing the project. The underlying principle was that the general taxpayers of the state were not to be burdened with the cost. The burden was to fall upon the users, the beneficiaries of the water development. This had led to statements that there would be no taxation to support the water project. Well, this is really

a misapplication of terms. The theory was that there should be no burden upon the general taxpayers of the state, and that the users of the water should bear the entire burden. But if a user of water happened to be identified as a water district, such as the Metropolitan Water District, there was nothing in these principles to indicate that the taxpayers in that particular district wouldn't be taxed to support the water project. In other words, the theory was that state taxpayers in areas not served by the water project would not be burdened on account of the project.

Now, in one sense this has not been totally carried out, because there are two types of general benefits that are not supposed to be allocated to the water users. They're supposed to be non-reimbursable by the water contractors. These are costs attributable to recreation and to the enhancement of fish and wildlife. These benefits are considered to be statewide and, under the policy implied in the Water Code and advocated by the legislature and the Department of Water Resources, but subject to necessary legislative appropriation, are to be borne by the state as a whole.

I think among the so-called contracting principles a very conspicuous requirement is that the rates for water and power would be established so as to return to the state all the reimbursable costs of the project--capital operation, maintenance, and replacement--including all principal and

interest on the project bonds, on expenditures from the California Water Fund, and any other moneys used in the construction of the project work. This would be for the repayment of the reimbursable costs. There's another contribution to the project that is not reimbursable by the water contractors, and that is the contribution of the federal government toward flood control, most of which would be identified with the Oroville Dam Project.

Now, the result of the application of these contracting principles is something that is unique in utility history. That is the water users, instead of paying a unit rate for water, like you pay for gas or electricity or as an ultimate consumer, you pay for water from whatever purveyor might serve you, under these state contracts the contracting agency must repay to the state the reimbursable capital costs as an absolute and irrevocable obligation, disassociated from the question of whether water is used in any particular quantity, or, theoretically, whether it is used at all. There's a total obligation on the part of the water contractors to reimburse the state for the capital costs of the project. In addition to that, the water contractors pay what is known as the minimum operation, maintenance and replacement costs, and these are costs which arise through the operation and maintenance of the system that are not dependent upon the amount of water being delivered at any particular time. In other words, the maintenance of the

system as a depreciable facility, irrespective of the extent to which its capabilities may be in immediate use.

The third category is what is known as the variable operation, maintenance, and replacement costs, and these go to expenses that are directly related to the amount of water flowing, such as the amount of power being used for pumping, and other operation and maintenance costs that are directly associated with the quantity of water being delivered at a particular time. So we have these three categories of costs that the water contractors are liable for--the capital costs; the minimum operation, maintenance, and replacement costs; and the variable operation, maintenance, and replacement costs.

In addition to these three categories of costs, there are two general subdivisions of the origin of cost. One is what is known as conservation charges, and these are concerned with the development and storage of water, that is, all costs associated with the Delta Project, the future storage and transport projects for augmenting the flow of the Delta, both as it must be augmented to supply the so-called dependable yield of the project and as projects must be developed to make up for the depletion in the areas of origin. That is because, in this whole process, there is nothing to limit the utilization of the water by the area in which the water originates, so as the depletions increase in the areas of origin, it is necessary to create more

projects in order to provide sufficient flow at the Delta to support the State Water Project. So we have this general category, the conservation charges, which supports the availability of water.

The other general category is the transportation charges. These have to do with all of the facilities for transporting the water from the Delta to the points of delivery to the water contractors, and this is mostly concerned with conveyance facilities, reservoirs, pumping plants, and drainage structures. In fact, ultimately it'll include, I suppose, the San Joaquin Valley Drain which will have to be constructed to dispose of irrigation return waters and other waste waters which otherwise would impair the quality of water available for use in the San Joaquin Valley.

As I mentioned, the District in 1959 had become very active in negotiating with the state, and toward the end of 1959, a number of meetings had been held with the governor and other state officials and committees of the legislature. And these meetings, you might say, culminated in the issuance in January 1960, of the Governor's Contracting Principles. This paved the way, then, for the negotiation of a contract. We must bear in mind here that in 1959 the legislature itself had adopted the Burns-Porter Act, which was an authorization for the project, but not the authorization for financing, which required an election



at which the voters of the entire state would have to pass on the bond issue. Now, this election actually was held on November 8, 1960, and the bond proposition was approved by a rather slender majority, supported mostly in the southern California areas. I think Butte County was the only county in northern California in which there was a favorable vote--Butte County being the county where Oroville Dam is being constructed, and there was some interest in the project in that county.

But going back to the negotiations between the District and the state, we find that after the Governor's Principles were announced, we had several very conspicuous meetings between the governor and the staff of the Department of Water Resources and directors and staff of the District. And the general counsel, Mr. Charles C. Cooper, Jr. and myself, with our respective staffs, were delegated to negotiate a contract in definitive form with the Department of Water Resources. So all through 1960 these staff meetings were continued. Mr. Harvey O. Banks at that time was the director of the Department of Water Resources. The negotiations were carried out directly with him and his legal and engineering staff and financial staff and so on, and these meetings were very numerous. I imagine that there were probably as many as forty meetings all through the year. We were up there almost every week, or they were down here--one or the other.

In April and June of that year, drafts of a proposed

contract were produced by the Metropolitan Water District and submitted to the Department. The June draft was considered in a two-day hearing by the Assembly Interim Committee on Water at Santa Monica on July 18 and 19, 1960. [The Department of Water Resources submitted a preliminary draft of contract at this hearing.] This was followed by issuance, in August, September, and October of 1960, of the Department's successively more definitive versions of the contract. The remainder of the negotiations after October were directed toward the reconciliation of the points of divergence between the Department and the District, some of which were quite conspicuous, that is, the differences of opinion on some points were quite marked.

One of the issues which has never been lost sight of since it had been very important in the minds of our board was the treatment of what is known as the East Branch Aqueduct. That's the branch of the aqueduct that extends from the south portal of the Tehachapi Tunnels easterly across the Antelope Valley, through the San Bernardino Mountains in tunnel, and south into Riverside County where it terminates at the Perris Reservoir. The position taken by the District was that there should be no compulsion about District participation in the cost of any facility unless the District elected to be served by means of the facility. The state took the position that MWD would have to be responsible for paying its share of a minimum size of East

Branch, the state's reason being that without MWD support for this branch, the funding available from other prospective contracts wouldn't be enough to carry it.

The reason that the District was opposed to being bound to participate to any particular extent was that the District studies had not been completely made at that time, and it was thought possible that it would be more economical for the District to confine its deliveries to the West Branch Aqueduct, which terminates at Castaic Reservoir and which is more directly in proximity to the District's central area.

PETERSON: The West Branch Aqueduct doesn't contribute water to District areas?

SKINNER: Physically, it would be possible for MWD to take delivery from the West Branch only. If this had been permitted by the state, the share of the capital cost of the East Branch chargeable to the District, which was on the general order of \$275 million, could have been either avoided or deferred. So the District had an economic interest at stake.

Now, the merits of the argument have never been fully settled. At least there has been no general accord among the various agencies and individuals involved. We certainly agree now, I think, that the East Branch is a necessary facility, even from the District's standpoint. Certainly our constituent agencies in San Diego County and Riverside County are very emphatic, and have good cause to be, on this particular point, because the East Branch is the most

direct avenue of service to these agencies. And with both the District's system, with its main backbone Foothill Feeder, and the service directly from the East Branch, of course, they are in a more secure position. But the state insisted that the District agree to participate in the construction of the East Branch to the extent of not less than a specified capacity which was defined as a maximum monthly delivery capability of 60,000 acre-feet for the District. Thus, the District was bound to pay its share of an East Branch Aqueduct having that much capacity in it for the District. Of course, at that time, it was not known how much capacity the East Branch would have for other contractors. This has all been worked out since. There are, I think, eleven other contracting agencies that take service from the East Branch Aqueduct. At that time, it wasn't known who they would be or how many there would be or what their total requirements, total contractual entitlements, would be.

But, in any event, to get back to the chronological sequence here, as the time converged on the date set for the election on the Burns-Porter bonds, the issue became hotter and hotter. There were meetings, telegrams flying back and forth, and charges of various kinds, and, at one point, the governor accused the board of lack of observance of the authority of the sovereign State of California, and so on. The board took considerable umbrage at some of the

things, but there were finally about six or seven points, as the date of the election approached, that had not been agreed upon, of which this East Branch issue was one. But, in addition to the capacity of the East Branch, the District did not want to be bound to any particular time for payment. In other words, if the choice of timing could have been left to the District, it could have enforced its own dictates as to when the East Branch would be built and, correspondingly, when its payment would become due for the capital cost.

This was finally worked out in this way. The contract provided that if all of the contracting agencies served by the East Branch agreed on a time for beginning service, that would be the time adopted by the state. Now, this provision was not specifically confined to the East Branch. It applied to both branches, but there was no particular controversy on the West Branch. So the adopted terms were that if the agencies by December 31, 1963 had not agreed on the time of construction, the state would then make the decision according to its own judgment as to what was best for all of the contractors. So, even though this was not acceptable to the District's board of directors, the state laid down in late October a final ultimatum that this was it or else, and that this was as far as the state would go in compromising the terms and conditions.

There were a number of other less conspicuous items in contention, but the controversy on the other items was

resolved more nearly to the mutual satisfaction of the parties as the time of the bond election approached. The board held a meeting just a week before the election and did approve entering into the contract. Now this wasn't unanimous by any means. As a matter of fact, the chairman of the board, Mr. Jensen, had opposed approving the contract and the authorization of the Burns-Porter Act bonds right up to the very last. But the board did authorize signing of the contract, and the contract was executed by the state and the District on November 4, 1960, just four days before the election on the Burns-Porter bonds. Whether the District's signing the contract was a significant factor in the approval of the bonds will never be known. I think that there are many people who believe it was, although how many of the voters knew that the District had entered into the contract might be a moot point.

PETERSON: Briefly, what were the other points of dispute between the state and the District?

SKINNER: [The two most highly controversial of the other issues related to (1) the time and manner in which the contract would become fully effective, or would become void in event of certain possible contingencies, and (2) a provision insisted on by the state imposing a surcharge on water used on "excess land," defined as land in excess of 160 acres held in single ownership, or in excess of 320 acres in joint ownership of husband and wife. As to (1)

above, the District sought to protect itself against impairment of the contract in the event legislation initiated during the 1961 session be enacted which would be inconsistent with the contract or require changes therein. The District objected strenuously to the surcharge referred to under (2), not only on equitable and legal grounds, but also because enforcement of the provision would be onerous and difficult, if not infeasible.

Another issue in dispute concerned the rights of the District to receive continued service on equitable terms after expiration of the contract, which remains in effect throughout the project repayment period, or for seventy-five years after the effective date, whichever period is longer. Also, there was extended debate regarding provisions for substantial uniformity of contracts executed by the state for a water supply from the project, to protect the District against discrimination which would result if subsequent contractors were accorded more favorable terms. Other items of last-minute negotiation involved technical and clarifying revisions.

The District was not wholly successful in achieving adoption of its views on the issues in controversy, but did obtain compromises which went part way toward meeting its objections. On the whole, the provisions for the District's involvement in the obligations concerned with the conveyance capacity and timing of construction of the branch aqueducts

were the most contentious part of the dispute, and in these aspects the final contract inclined substantially toward the position taken by the state.]

PETERSON: When Jensen opposed the ultimate reconciliation between the District and the state, did he have any alternatives?

SKINNER: His alternative was that if we held off approving the contract, we might get a better one, subsequently. However, if the bond authorization had been defeated, whether it could have been reinstituted as a possibility of legislation is anybody's guess. That'd probably never be known. But it was certainly very evident that the legislature was not disposed, you might say, to become any more favorable toward a water project which would include service to southern California.

As a matter of fact, it turned out that although the legislature had enacted the Burns-Porter Act, hearings in the subsequent years showed quite clearly that if the legislature had it to do over again, it would be rather dubious that the legislation could have been passed. It developed that members representing a considerable voting strength in the legislature were quite dissatisfied with some of the things that were in the act, even though some of them had supported it. The senate would have amended the act in a number of ways, but the assembly, in which southern California had a proportionately larger vote than in the



senate, successfully blocked the attempts by the senate to amend the act or do things that would have imposed limitations on the carrying out of the project by the state administration.

But, in any event, the contract was signed. The Burns-Porter Act bonds were voted, and the state project went ahead full steam. The state became very active immediately after that in negotiating water supply contracts with other contractors. The second contract entered into was with the San Bernardino Valley Municipal Water District. This was entered into in December of 1960, after the bond issue was voted. In 1961 a number of other agencies contracted. The period of contracting extended, I think, into 1963. The largest quantity of water which the state agrees to furnish to a contractor during any one year is called the maximum annual entitlement. The District's such entitlement was 1.5 million acre-feet a year, as originally provided under the contract. But by contract amendment this was increased to 2 million acre-feet.

The reasons for the District seeking more water from the project were the result, principally, of the outcome of the litigation between California and Arizona on rights to water from the Colorado River. The decree of the court finally handed down on March 9 of 1964 provided that California would be entitled to 4.4 million acre-feet when there is 7.5 million acre-feet of mainstream water available for

annual consumptive uses in the three states of Arizona, California, and Nevada, which are identified territorially with the lower basin. Arizona had a similarly-conditioned allotment of 2.8 million, and Nevada of 300,000 acre-feet, making 7.5 million in all. The availability of as much as 7.5 million acre-feet annually of mainstream water for consumptive uses in the lower basin is not going to be a long-continued situation. In fact, even at the present time, it's doubtful if there is a firm yield of as much as 7.5 million acre-feet annually of mainstream water for consumptive uses in the lower basin after the Mexican treaty allotment of 1.5 million acre-feet is fulfilled. And the release of water from the upper basin at Glen Canyon would have to be about 10 million acre-feet in order to satisfy this 7.5 million acre-feet of available water for consumptive uses in the three states of California, Arizona, and Nevada.

That comes about in this way. If you subtract 1.5 million from 10, that leaves 8.5, and there's at least 1 million acre-feet of losses in excess of accretions. In other words, between the upper basin and the points of diversion in the lower basin there are tributaries which do add water, but there are also transpiration losses through wild vegetation and a great deal of evaporation, including about 800,000 acre-feet a year of water from Lake Mead. So the losses exceed the accretions by at least 1 million acre-feet

below Glen Canyon or, in the terms of the Colorado River Compact, below Lee Ferry, which is near Glen Canyon. [Since the average annual mainstream flow at Lee Ferry is expected to fall considerably below 10 million acre-feet as consumptive uses continue to increase in the upper basin, the quantity available for uses in the three lower basin states in the foreseeable future will be less than 7.5 million acre-feet.] So as time goes on, the 4.4 million acre-feet provided for in the U.S. Supreme Court decree would not actually be available to California unless legislation is enacted to ensure it. The decree didn't say how shortages would be allocated. The decree left this to the Secretary of the Interior, and left it to Congress to direct him, if necessary, subject to existing statutes.

But, in any event, it was quite apparent that under this decree, as Arizona's uses increased, California would be hard-pressed to even obtain its decreed amount of 4.4 million annually. The total use in California now is much more than that. It's been running about 5.1 million acre-feet a year. In fact, possibly the maximum annual diversion has been as much as 5.3 million. But legislation now pending in Washington would protect California's 4.4 million against Arizona's new uses. It would protect California's uses against the Central Arizona Project to the extent of 4.4 million, but the sad fact here is that even with the 4.4 million, which is the amount decreed to California by the

U.S. Supreme Court, Metropolitan's allotment will be reduced by 55 percent. The current contractual allotment to MWD is 1,212,000 acre-feet a year. Of that, 622,000 is in what is known as the fifth priority and [is excluded from the 4.4 million acre-feet allocated to California by the U.S. Supreme Court. This comes about because the 4.4 million is only sufficient to encompass the 3,850,000 acre-feet in the first three priorities apportioned to water agencies and reclamation projects in Imperial and Riverside counties, plus 550,000 acre-feet in the fourth priority apportioned to Metropolitan.] So that, at such time as the available amount for California is cut down to 4.4 million acre-feet, the Metropolitan Water District would be reduced to 550,000 acre-feet a year.

Foreseeing the probability that, say, by 1990, Metropolitan might actually be reduced to about 550,000 acre-feet a year, even with the protection available to California under pending legislation, the Metropolitan Water District, finding itself able to increase its maximum annual entitlement to state project water, did so, and by contract amendment the allocation was increased from 1.5 to 2 million acre-feet a year.

# INDEX

Arizona, State of	67-69
<u>Arizona v. California</u>	67-68, 69, 70
<u>Assessment Limitation Act</u>	5
Banks, Harvey O.	59
Bechtel Corporation	51
<u>Bulletin No. 1, California</u>	
Department of Water Resources	46-47, 49
<u>Bulletin No. 2, California</u>	
Department of Water Resources	47, 49
<u>Bulletin No. 3, California</u>	
Department of Water Resources	47, 48, 49
<u>Bulletin No. 78, California</u>	
Department of Water Resources	51-52
Burns-Porter Act	16, 52, 58, 62, 64, 66-67
California, State of	67-69
California Aqueduct	27
California State Department of Public Works	44
California State Department of Water Resources	45, 46, 47-48, 55, 59-61
California State Water Resources Board	
<u>see, California State</u>	
Department of Water Resources	
California Water Fund	52, 56
California Water Plan	45, 49-50
<u>The California Water Plan</u>	
<u>see, Bulletin No. 3, California</u>	
Department of Water Resources	
Calleguas Municipal Water District	38
Central Arizona Project	69
Central Basin Municipal Water District	35, 41
Central Valley Project Act	45
Chino Municipal Water District	34, 35
Coastal Municipal Water District	21, 30
Colorado River Aqueduct	7, 24, 43, 44
Colorado River Compact	69
<u>Contracts, Financing, Cost</u>	
<u>Allocations for State Water</u>	
Development	
<u>see, Fact Finding Committee on</u>	
Water Resources, California	
State Senate	
Cooper, Charles C., Jr.	59

Delta Project	
<u>see</u> , State Water Project	
Diemer, Robert B.	24, 26-27
Division of Water Resources	
<u>see</u> , California State Department of Water Resources	
East Branch Aqueduct	46, 60-63
Eastern Municipal Water District	33, 35, 44
Edmondston, A. D.	46, 49
Edmondston, Robert M.	51, 52
Engineering Department, City of Los Angeles	
<u>see</u> , Los Angeles City Bureau of Engineering	
Fact Finding Committee on Water Resources, California State Senate	54
Feather River and Delta Diversion Projects	
<u>see</u> , State Water Project	
Foothill Municipal Water District	35
Frank E. Weymouth Memorial Water Softening and Filtration Plant	20
Gaylord, James M.	9
Governor's Contracting Principles	54-56, 58, 59
Hinds, Julian	8-9
Howard, James H.	22
Hyatt, Edward	45
<u>Investigation of Alternative     Aqueduct Systems to Serve     Southern California</u>	
<u>see</u> , Bulletin No. 78, California Department of Water Resources	
Jensen, Joseph	64, 66
Lake Mathews	13, 17, 27, 28
Las Virgenes Municipal Water District	38
Los Angeles City Bureau of Engineering	2-3
Los Angeles City Department of Water and Power	50
Los Angeles County Flood Control District	5, 6-7

Mathews, W. B.	22
Metropolitan Water District	7-8, 10, 12-13, 14, 15-16, 17, 21, 23, 24-25, 28-30, 32, 34, 35, 36-38, 39, 43-44, 51, 53-54, 55, 58, 59-65, 67, 70
Metropolitan Water District Act	14, 21-23, 35, 36
Morris Dam	7, 40
Mulholland, William	11-12, 21
Opid's Camp, Calif.	40
Orange County Municipal Water District	34, 35
Oroville Dam	53, 56, 59
Palos Verdes Feeder	20
Palos Verdes Reservoir	20
Perris Reservoir	27
Pomona Valley Municipal Water District	33, 34, 35
Puddingstone Reservoir	27-28
Sacatella storm drain system	3-4
San Bernardino Valley Municipal Water District	67
San Diego, Calif.	30-31, 44
San Diego Aqueduct	31-32
San Diego County Water Authority	30-32, 36
San Gabriel Number One (dam)	7
San Gabriel River	40
San Gabriel Valley	39-42
San Gabriel Valley Municipal Water District	41, 42
San Jacinto Tunnel	7
San Joaquin Valley Drain	58
Santa Ana Valley	25
Santa Monica, Calif.	28-29
Santa Monica Feeder	17
State Water Plan	45
State Water Project	27, 46, 49-51, 52, 53, 57, 58-59
Tuttle, E. A.	12
U.S. Army Corps of Engineers	5, 7
Upper Feeder	14-15, 17-20, 27
Upper San Gabriel Valley Municipal Water District	39, 41
Warne, William E.	48
Water Authority Act	36

Water Code	50, 55
Water Resources of California	
<u>see, Bulletin No. 1, California</u>	
Department of Water Resources	
Water Utilization and Requirements	
<u>of California</u>	
<u>see, Bulletin No. 2, California</u>	
Department of Water Resources	
Weinberger Caspar W.	47
West Basin Municipal Water	
District	33, 35
West Branch Aqueduct	61, 62
Western Municipal Water District	35
Weymouth, Frank E.	8, 9-10, 12