I am delighted to be in Phoenix for a visit with old friends of the Reclamation program, and to discuss current water resource development activities and issues here in Arizona.

Your invitation also gives me the opportunity to pay special tribute to our Arizona Projects Manager, Cliff Pugh. As most of you know, Cliff was in Washington last week to receive the Department of the Interior's highest honor--the Distinguished Service Award--for his leadership in developing solutions to water problems in the Southwest.

I congratulate Cliff on this recognition.
Today I want to discuss with you a number of aspects of the Reclamation program—both of general and specific interest to your association.

Overall, our budget for the current fiscal year is expected to exceed $600 million. This is an increase of about $95 million over the previous fiscal year. The budget for the current year is based on the philosophy that construction of on-going projects should be conducted in an orderly and efficient manner.

We hope that philosophy will continue to prevail; however, the effect of the current effort to reduce the Federal appropriation by $25 billion remains to be seen.

An orderly construction program is highly important to water resource development in the West. Stretchouts and undue delays greatly increase administrative and overhead costs, and delay
beneficial returns in terms both of repayment to the U.S. Treasury and of economic growth so essential to the welfare of the direct beneficiaries and the Nation.

In fact, I believe the Bureau of Reclamation creates a greater variety of tangible long-range benefits for people than any other agency within the Interior Department, and perhaps within government.

Our projected program over the years ahead will continue to build on this record, provided we are given the funds and adequate personnel. The Congress controls the funds, and OMB controls the personnel ceiling.

Now I would like to turn to some of the specific Reclamation activities currently underway here in Arizona, including the status of the CAP, the salinity control program, and the Yuma pipeline.

Since my talk with you two years ago, I am
pleased to report that construction on the Central Arizona Project has gained considerable momentum.

The $10 million contract awarded to the Kirst Construction Company of Altadena, California, in April 1974, for Reach II of the Granite Reef Aqueduct, will near completion this month. Reach II extends a distance of 12.4 miles from Cave Creek Road to 108th Street, crossing Paradise Valley. A feature of this work now in place is the Paradise Valley Flood Detention Dike. While providing protection of the aqueduct from flash floods, the dike also affords major flood control along Indian Bend Wash through Paradise Valley.

To our West, near Parker, we are underway with the Buckskin Mountains Tunnel. The J. F. Shea Company, Incorporated, of Walnut, California, was awarded the contract to construct this 6.9 mile tunnel in February of this year with a low bid of
$58.2 million. As of November 1, the contractor had earned nearly $13 million for work accomplished. In addition to the tunnel itself, the work includes transition features at both ends of the tunnel as well as a 17 mile access road from near Parker to the east tunnel portal. The access road has been completed and the staging area to support the tunnel boring operation, including the first 500 feet of the aqueduct is nearing completion.

The tunnel will be machine bored and have a reinforced concrete segment lining 22 feet in diameter. The machine to perform this work, aptly referred to as the "mole", is being constructed by the Robbins Company of Seattle, Washington—a subcontractor to the Shea Company. The "mole" provides two rather unique construction and safety features. Not only will it bore the tunnel, but, in addition, it will erect the precast concrete segment lining for the finished tunnel. All "mole" operating personnel
will work under a shield which is an integral part of the machine and thus will not be directly exposed to falling rock. Those working behind the "mole" will be protected by the completed tunnel lining.

The construction schedule calls for the "mole" operation to begin at the east face of the tunnel next spring. The tunnel should be completed 3 years from then.

Last June a contract was awarded to Peter Kiewit Sons' Company of Omaha for the construction of three siphons to be placed under the Agua Fria River, New River, and Salt River portions of the Granite Reef Aqueduct. The low bid was over $34.2 million. The siphons, to be constructed from precast concrete pipe manufactured by AMERON, Incorporated, will have an inside diameter of 21 feet—the largest concrete pipe ever produced for water conveyance purposes. AMERON is now constructing the equipment necessary
to manufacture and handle this large pipe.

New work planned in connection with the Granite Reef Aqueduct and Transmission System, scheduled to begin this fiscal year, includes the awarding of contracts for the construction of Reach 10, the western portion of Reach 5, the Davis-Parker 230-kV transmission line No. 2 extending from Davis Dam to Parker Dam, and switchyard modifications at the Davis and Parker switchyards. Reach 10 will run north and west of Phoenix for 14.4 miles from New River to Cave Creek Road. On Reach 10, the aqueduct will pass under Interstate 17, the Black Canyon Highway, approximately seven miles north of Bell Road. The western portion of Reach 5 begins less than one mile north of Interstate 10 at the east boundary of Centennial Wash and extends eastward 7.1 miles. A flood detention dike will be a feature of this portion of Reach 5.

I want to insert at this point some remarks on
the role being played by local communities in CAP construction decisions. This is an ongoing record of which I am proud and which I believe bodes well for the future.

Operating as an ad hoc recreation planning team, a group led by the Arizona Projects Office and including representatives of the parks and recreation agencies from Maricopa County, Scottsdale and Phoenix, and the State Land Department, have been meeting informally twice a month to develop a master plan to take advantage of the recreation potential of Reach 11 and immediately adjacent areas. While the plan has not yet been formally adopted by the respective local government organizations, the spirit and enthusiasm of their representatives in its development has been an inspiration. Significant modifications to our construction plans have come from the inputs of this committee.
Aquarius Sprinklers, Incorporated, of Scottsdale, currently responsible for a contract to develop a 7-1/2 acre test plot on the dike to evaluate revegetation possibilities, is incorporating in its work the recommendations of this committee to test seven different types of desert shrubs other than cactus, three types of drip irrigation and three different plant densities.

The sinuous pattern of the line of the dike is the result of the committee considering drawings prepared by Talieson West for the city of Scottsdale. The drawings were intended to facilitate development of the areas adjacent to the dike into park facilities. Making the aqueduct esthetically appealing and having it serve as the basing point to develop an area with a wide range of recreational activities for our citizens demonstrates local community responsibility in the best sense.
One additional feature of this planning for park and recreation opportunities along or adjacent to the aqueduct and dike right-of-way has been a recognition of the need to provide for public safety. The Arizona Projects Office is mindful of the need to incorporate reasonable precautions in how the aqueduct is completed, and to see that present and future uses will be properly administered.

The preparation of environmental impact statements is one of our major pre-construction tasks.

The CAP overall final environmental statement was filed in September 1972. Since that date final environmental statements have been filed on the Granite Reef Aqueduct and the Havasu Intake Channel, Havasu Pumping Plant and Buckskin Mountains Tunnel. In August of this year, the final environmental statement was filed on the Granite Reef Aqueduct.
Transmission System.

Currently, the Arizona Projects Office has a multi-disciplinary team preparing the draft of the environmental statement on Orme Dam and Reservoir with January as its completion goal. We are hopeful of being in a position to submit the final environmental statement for this CAP feature by January 1977. Our calendar for 1976 includes submitting the draft environmental statement for the Salt-Gila Aqueduct in April and a similar draft statement for Buttes Dam and Reservoir in August.

We begin to impact the environment as we buy land necessary for the Project. For the past three years, the Bureau of Reclamation, through the Arizona Projects Office, has pursued an aggressive land and right-of-way acquisition program. A major share of this program has been conducted in the rapidly developing Phoenix metropolitan area.
To date, we have acquired approximately 360 parcels of land for a total cost of approximately $11.6 million. Insofar as the metropolitan area is concerned, we have acquired approximately ninety-three percent of the right-of-way required for Central Arizona Project facilities from New River through the Deer Valley, Paradise Valley, Scottsdale, Mesa areas to the Pinal County line, excluding the Fort McDowell and Salt River Indian Reservations. Only seven of these parcels had to be acquired through condemnation proceedings.

We are continuing to discuss and cooperate with the two Indian Communities concerning the possible land requirements from their respective reservations for Orme Dam and Reservoir and Reach 12 of the Granite Reef Aqueduct. We are coordinating several ongoing studies with both Communities to help clarify the relationship between these reservations.
and the Central Arizona Project.

Last April, the proposed allocation of Central Arizona Project water to the Central Arizona tribes was published in the Federal Register.

The public was given 60 days to comment on the proposal and about 90 written comments were received. A careful review of the comments will be made in the Department.

Moving on to an entirely different topic, I believe many of you are aware of the suit filed in June by two environmental groups and three individuals seeking an injunction to stop the construction of three siphons on the Granite Reef Aqueduct. The plaintiffs contend that if the siphons were constructed, the opportunity to select an alternative to Orme Dam and Reservoir would be foreclosed. The Government believes that such a direct relationship does not exist, and hopes therefore, the request for an injunction will be dismissed. A date for the
hearing has not been set. The Central Arizona Water Conservation District has filed a motion to intervene as a defendant in the case.

Arizona boasts a number of "firsts" throughout its water history. The Hohokams who farmed the river valleys in central Arizona as early as 200 years B.C. were probably America's first irrigators. The Salt River Project, built early this century, was Reclamation's first multipurpose development. Its Theodore Roosevelt Dam generated the first Reclamation hydroelectric energy. And now, Arizona, within a few years, will be the home of the world's first large water desalting plant.

The Yuma Desalting Plant will be capable of producing 104 million gallons-per-day or nearly 100,000 acre-feet of good quality water per year. It will be the United States' main facility for meeting the requirements of Minute 242, the
agreement with Mexico for improving Colorado River water deliveries to our neighbor across the border. The plant, scheduled to begin operation in 1981, will treat drainage water from the Gila Project's Wellton-Mohawk Division of southwestern Arizona and put most of it back into the Colorado River for diversion to Mexican farmlands at Morelos Dam.

In designing and building this unprecedented facility, Reclamation has entered a new phase of total water management. Water now flowing unused through the Wellton-Mohawk drainage channel and bypassed to the Colorado below Morelos Dam will be diverted to the plant. About 70 percent of the feedwater will emerge from the plant as high quality water to be blended with untreated water to meet the requirements of Mexican irrigators. The Yuma plant, when completed and in operation, will provide the ultimate in water management.
Reclamation engineers at present are developing design criteria for the Yuma Desalting Plant. The plant presents a unique and different challenge, for our engineers are called upon to design a plant to operate six years from now under conditions which are not precisely known today. They are required to hit a moving target.

The Yuma Desalting Test Facility is providing valuable data for design of the Desalting Plant. Located on the Wellton-Mohawk drain at the confluence of the Gila Gravity Main and Wellton-Mohawk Canals southeast of Imperial Dam, the test facility provides a laboratory for nine manufacturers of reverse osmosis and electrodialysis membrane modules. Actually it is a prototype of the Yuma Desalting Plant. Large membrane modules like those to be used in the 104-million-gallons-per-day plant will be tested in the facility.
The Yuma Desalting Plant is only one of several features of the Colorado River Basin Salinity Control Project's Title I. Construction is underway on the first contract for replacement of the metal flume on the main outlet drain extension at Yuma with a concrete siphon.

Mexico has opened bids on the first of two sections of the bypass drain from the International Boundary to Santa Clara Slough, near the Gulf of California. And next June, the Bureau of Reclamation expects to begin construction on the extension of the main outlet drain from Morelos Dam to the boundary.

The extension will carry reject brine from the Yuma Desalting Plant and be capable of carrying the entire Wellton-Mohawk drainage flow if an emergency shuts down the plant. The bypass drain will be 50 miles long—16 miles in the United States and 34 miles
in Mexico. The entire drain--extending from the upper end of the Wellton-Mohawk Valley to the Santa Clara Slough--will be 142 miles long.

Is it worth all of the effort? The answer is definitely "yes". First, it will permanently and definitively solve a water quality problem between the United States and Mexico which has held international attention for the past 15 years. Second, it will make useable a large part of the water currently bypassing Morelos Dam without credit to the U.S. And third, it will provide the entire world with technology in large-scale water desalting. This could be the breakthrough in mankind's efforts to aid the many world areas with saline water problems.

And it is possible the plant could someday benefit one of Arizona's fine and prosperous cities--Yuma. The Colorado River Basin Salinity Control Act
gives the City of Yuma priority on the use of any surplus water from the Yuma Desalting Plant. The plant's treated water would do much to improve the quality of Yuma's municipal and industrial supply from the Colorado River.

Due to irrigation return flows below Imperial Dam, the quality of water presently arriving in the River at Yuma is too saline for municipal use.

Arizona Congressman Steiger has introduced a bill which would authorize the Secretary of the Interior to construct, operate, and maintain facilities to deliver to Yuma the water supply to which it is entitled. The bill would authorize the Secretary to acquire capacity rights in the All-American Canal and construct a conveyance pipeline from the All-American Canal to the City's treatment facilities. Acquiring capacity rights in the All-American Canal will involve negotiations
and contract revisions with the All-American Canal water users.

The City is also studying a proposal for continued use of Yuma Project irrigation facilities for conveyance of its Colorado River entitlement.

Studies now completed indicate there is a high probability that surplus water will be available from the desalting plant, during the later years of operation. Regardless of this possibility, Yuma will need permanent facilities or other arrangements with the All-American Canal water users for delivery of Colorado River water, and the Bureau of Reclamation will provide assistance in this area.

This has been a rather lengthy discussion, and we have covered a lot of ground. In closing, I want to express my appreciation to your association for your continued support of sound water resources development and management in Arizona. Reclamation—to
Hon. Gilbert G. Stamm  
Commissioner of Reclamation  
Department of the Interior  
7654 Interior Building  
Washington, D. C. 20240

Dear Gil:

The officers, directors, members of the Central Arizona Project Association, and I thank you for attending and addressing our annual meeting in Phoenix on December 9.

A record number attended the meeting to hear you, and were pleased to hear your first-hand report of progress on our project.

Your speech on December 11 at the Colorado River Water Users Association was also of great interest. Since I am a member of that organization's education and publicity committee I particularly appreciated your kind remarks about our brochure. We will soon be preparing a new one titled The Colorado River and Energy. If you have any suggestions along that line I will surely be pleased to receive them.

With best personal regards.

Sincerely,

Rich Johnson

RJC
Man’s Quest For Water

Colorado River water will someday flow to the fertile valleys of central Arizona where, before the time of Christ, the Hohokam Indians established an extensive irrigation civilization. Had these primitive people known how to build storage dams and drainage systems as does man today, they might not be called Hohokam — “the people who are gone.” Although Central Arizona Project water will lessen the impact of continued ground water overdraft to maintain the existing economy, by the end of this century, or before, additional water will be needed to stave off water bankruptcy.

What CAP Will Do

The Central Arizona Project was authorized by the Colorado River Basin Project Act (Public Law 90-537) of September 30, 1968.

Constant vigilance in the development and management of water resources has been essential in sustaining a strong economy in central and southern Arizona. For over three decades, central Arizona’s natural water supply has been out of balance with total water demands, and the agricultural economy in particular has flourished and declined in direct relationship to the adequacy of water resources. Massive overpumping of ground water reserves has been necessary to balance the yearly supply-demand relationship. The current annual overdraft of the underground basins is over two million acre-feet. The importation of Colorado River water through construction of the Central Arizona Project will be a giant step toward reducing this annual overdraft, which is causing ground water levels to decline at an average rate of 8 to 10 feet per year with serious land subsidence occurring in many areas.

The Central Arizona Project will provide supplemental water for established agricultural areas in Maricopa, Pinal and Pima Counties, as well as municipal and industrial water for the rapidly expanding Phoenix and Tucson metropolitan areas. Other water-deficient areas of Arizona and western New Mexico will also benefit from the Project under the water exchange principle. In addition, the Project will provide substantial benefits from power generation, flood control, outdoor recreation, fish and wildlife conservation, and sediment retention.
The CAP Plan

The basic plan calls for construction of a series of pumping plants and aqueducts, which will lift Colorado River water hundreds of feet from Lake Havasu and carry it to the Project service areas in Maricopa, Pinal and Pima Counties. Construction of dams and reservoirs on the Salt, Gila, and San Pedro Rivers will provide needed regulatory, conservation and flood control storage capacity, as well as additional recreational and water exchange opportunities. Federal participation in the Navajo thermal generation powerplant near Page, Ariz., will provide pumping power requirements for the Project.

Havasu Diversion - Granite Reef Aqueduct

An intake channel and high-lift pumping plant located on the south shoreline of the Bill Williams River arm of Lake Havasu, some 2 1/2 miles upstream from Parker Dam, will divert Colorado River water for Project uses. The pumping plant will lift water over 800 feet from the lake to the inlet portal of the 6 1/2-mile-long Buckskin Mountains Tunnel. The Granite Reef Aqueduct will carry water from the tunnel about 190 miles to Orme Dam. The concrete-lined aqueduct will have a maximum capacity of 3,000 cubic feet per second. In addition to the initial pumping plant at Lake Havasu, the Aqueduct will require relift pumping stations located at the Bouse Hills, Little Harquahala Mountains, and near the Hassayampa River. To deliver water from the Colorado River to Orme Dam will require a total pump lift of about 1,200 feet.

Orme Dam And Reservoir

Orme Dam, an earthfill structure, will be located about 25 miles northeast of Phoenix, near the confluence of the Salt and Verde Rivers. The multipurpose storage reservoir will be operated with the present Salt River Project storage system, and will provide terminal regulatory capacity for the Granite Reef Aqueduct, flood control capacity to meet the requirements of the Phoenix metropolitan area, sediment control, and additional conservation capacity. Orme Reservoir will also provide an excellent outdoor recreational facility for Phoenix metropolitan area residents. Recreational development of the entire reservoir, including Indian lands and Federally-owned lands adjacent to the reservoir, will be in accordance with the coordinated master plan approved by the Secretary of the Interior.
**Salt-Gila Aqueduct**

When constructed, the Salt-Gila Aqueduct will be nearly 97 miles in length, with a capacity of 2,500 cubic feet per second over its first 63 miles and a capacity of 750 cubic feet per second over the last 34 miles. It will be fed either directly from the Granite Reef Aqueduct or by pumping from Orme Reservoir. A pumping plant will be required to lift Project water into the Aqueduct from either source, and two additional pumping plants will lift the water about 460 feet for passage through the Picacho Mountains. Colorado River water will be carried by this Aqueduct into the agricultural areas of southeastern Maricopa County and the lower Gila and Santa Cruz agricultural areas of Pinal County. The system will also provide the means to convey municipal and industrial water to the rapidly growing metropolitan area of Tucson.

**Buttes Dam and Reservoir**

Buttes Dam will be constructed on the Gila River within Pinal County about 4 miles upstream from the existing Ashurst-Hayden Diversion Dam. This multipurpose storage facility will provide conservation and flood and sediment control capacity. Realization of important outdoor recreation and fish and wildlife benefits will also be afforded by creation of this multipurpose Project facility.

**Tucson Aqueduct**

The Tucson Aqueduct, originating at the terminus of the Salt-Gila Aqueduct, near Marana, Ariz., will convey municipal and industrial water to the city of Tucson. The 20-mile-long concrete pipe aqueduct will have a capacity of 150 cubic feet per second. Two pumping plants located near Marana will be required to lift the water over 450 feet from the Salt-Gila Aqueduct to the city of Tucson.

**Charleston Dam and Reservoir**

Charleston Dam, a multipurpose storage facility to provide conservation and flood control capacity, will be constructed on the San Pedro River in Cochise County about 65 miles southeast of Tucson. The water supplied from the reservoir will be used primarily for municipal and industrial purposes in Tucson; however, improved regulation of San Pedro River flows will benefit downstream water users as well. Important water-oriented outdoor recreation, as well as sediment retention, will be realized by this segment of the Project.

**San Pedro Aqueduct**

This 70-mile concrete pipeline will carry about 12,000 acre-feet of water annually from the Charleston Reservoir to the Tucson area. The total pumplift for this Aqueduct will be nearly 330 feet.

**Hooker Dam and Reservoir**

Hooker Dam or a suitable alternative will be located on the Gila River in Grant County, New Mexico. The structure, a multipurpose storage facility, will allow water users in New Mexico to increase their consumptive use from the Gila River and its tributaries. This increased water use in New Mexico will be implemented through Project water exchange agreements with downstream water users in Arizona. Primary uses of the water will be for domestic and mining-oriented industrial purposes. The storage facility will also optimize flood and sediment control, as well as regulate river flows, for the benefit of developed agricultural lands downstream from the dam. Extensive outdoor recreation and fish and wildlife benefits will also be provided by the reservoir.
Distribution System

Congress has authorized an additional $100 million to be appropriated for construction of distribution and drainage systems necessary to convey water to non-Indian lands. These funds could be made available in three ways. First, the distribution systems may be constructed under the provisions of the Distribution Systems Loan Act of 1955, Public Law 84-130. This allows an irrigation district or similar water user entity to hire a consulting engineer to plan, design, and supervise the construction of the district's distribution system under designs approved by the Bureau of Reclamation. Second, for smaller districts or those which can be broken into small integral units, Public Law 84-984, the Small Reclamation Projects Act, may be most appropriate. Again, the district obtains a loan and hires consultant services. Third, the district may prefer to have the Bureau of Reclamation plan, design, and supervise the construction of the system.

Cost of constructing distribution systems for Indian lands is included in the estimated cost for the Project.

Electrical Power Requirement

Approximately 547 megawatts of capacity will be required in the operation of the Central Arizona Project. To meet this requirement, arrangements have been made for the United States to acquire an entitlement to a portion of the capacity of the Navajo Generating Station and its associated transmission system. These facilities are being constructed by non-Federal interests. The Generating Station located near Page, Ariz., is fueled by coal from nearby Black Mesa and other deposits on the Hopi and Navajo Indian Reservations.

Construction

Initial water is scheduled for delivery in 1985 if funds are appropriated according to schedule. Construction of the entire Project will require about 3.5 million cubic yards of concrete, 5 million barrels of cement, and 240 million pounds of reinforcing and miscellaneous steels. Earth movement for dam and canal construction will be about 140 million cubic yards.

Cost and Repayment

The estimated construction cost of the Central Arizona Project as of January 1974 is $1.4 billion. Construction costs are allocated to the purposes of municipal and industrial water, irrigation water, power, outdoor recreation, flood control, and fish and wildlife. Costs of the water salvage, Indian land distribution systems, and fish hatcheries and wildlife refuge programs are also included. No interest will be charged on costs allocated to irrigation; however, irrigation water charges will repay all operation and maintenance costs and a share of the construction costs. Financial assistance in excess of irrigators' ability to repay construction costs will be obtained from Arizona's portion of the Lower Colorado River Basin Development Fund. This fund is derived from Central Arizona Project revenues and surplus revenues acquired from the Boulder Canyon Project, Parker-Davis Project, and the Pacific Northwest-Pacific Southwest Intertie power operations, after completion of their respective repayment contracts.

About 75 percent of the construction costs will be returned to the Government by the people who benefit directly from the Project. Since the direct beneficiaries of flood protection and water salvage expenditures cannot be identified, these costs will be nonreimbursable. A portion of the recreation and fish and wildlife costs will be repaid in accordance with Public Law 89-72, where applicable. Costs for the Indian distribution systems, in excess of the repayment capability of Indian lands, will be nonreimbursable.

In June 1971, the Central Arizona Water Conservation District was formed for the express purpose of contracting with the United States Government to repay the reimbursable costs of the Central Arizona Project. On December 15, 1972, a repayment contract with a maximum obligation of 1.2 billion dollars was signed by the Central Arizona Water Conservation District and the Secretary of the Interior.

U.S. Department of the Interior
Rogers C. B. Morton, Secretary

Bureau of Reclamation
Gilbert G. Stamm, Commissioner
As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.