

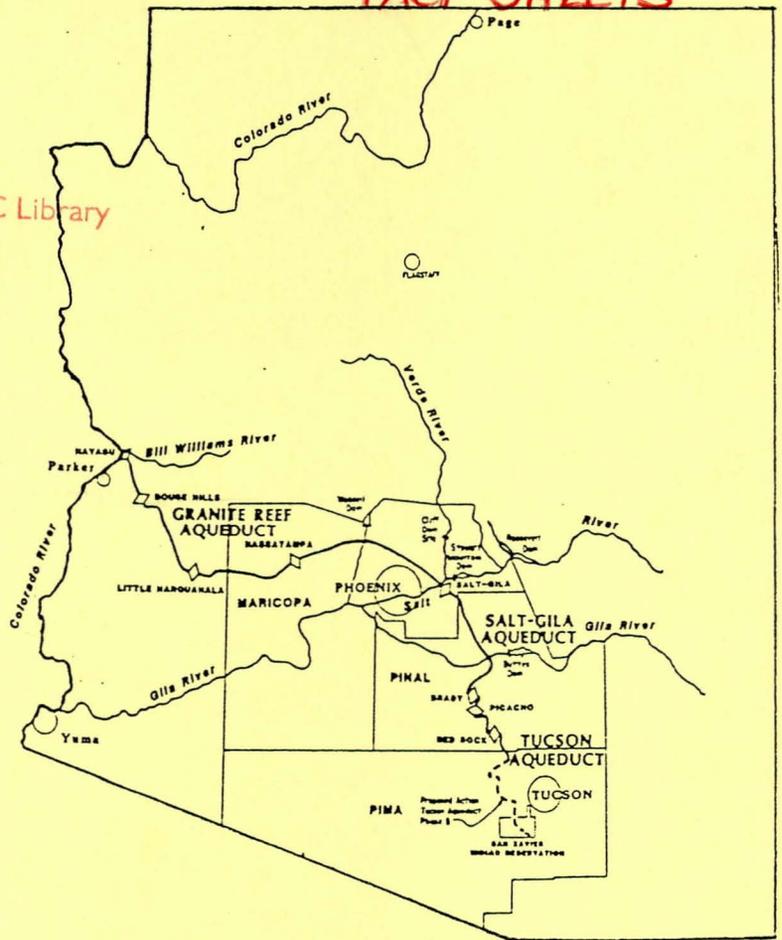
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
LOWER COLORADO REGION
ARIZONA PROJECTS OFFICE



November 1984

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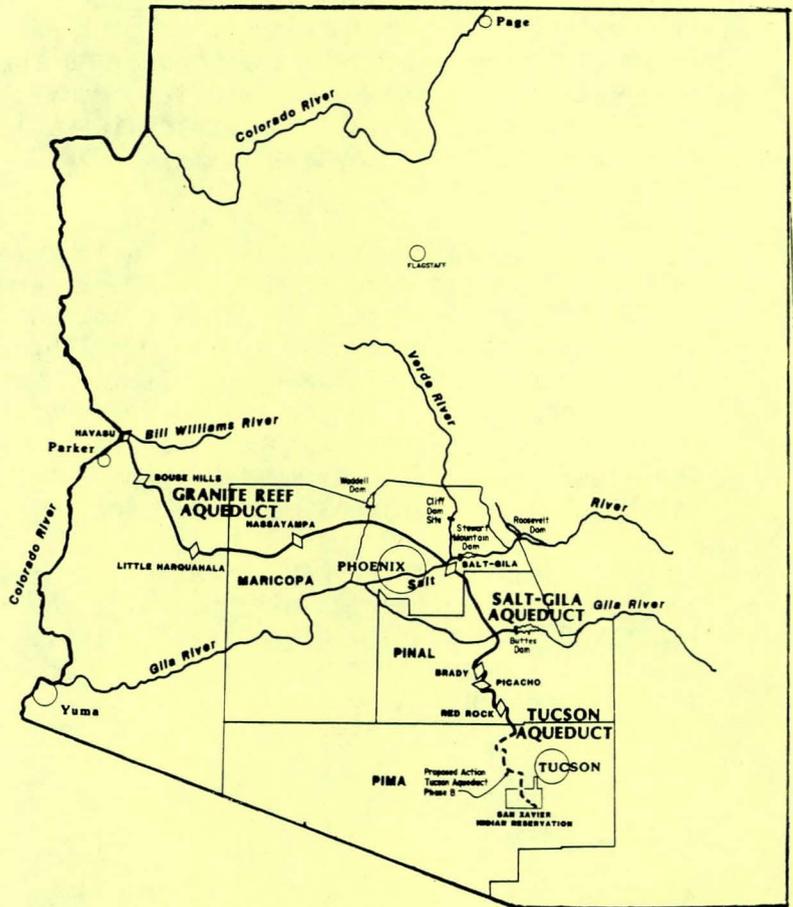
The Central Arizona Project (CAP) is a water resource development and management project under construction by the Bureau of Reclamation for the State of Arizona. Authorized in September, 1968, the project will bring an average 1.2 million acre-feet of the State's 2.8 million acre-foot Colorado River entitlement into Maricopa, Pinal and Pima Counties each year. Other water short areas of the State, as well as a portion of western New Mexico, will also benefit from the project through water exchanges.

Of the annual average 1.2 million acre-foot delivery, 640,000 acre-foot has been allocated to 71 cities and towns and 14 industries; 309,828 acre-foot has been allocated to 12 Indian communities; and the remaining amount has been allocated to 23 non-Indian agricultural entities on a percentage-of-available-supply basis.

An approximately 330-mile long water conveyance system of concrete-lined canal, inverted siphons, tunnels, and pumping plants, will carry the water from Lake Havasu near Parker, Arizona, to the southern boundary of the San Xavier Indian Reservation southwest of Tucson, Arizona. The aqueduct system will be operated with the aid of a computer system from the project headquarters complex in north Phoenix.

The water will be lifted nearly 2,900 feet in elevation between the Colorado River and its final destination. It will be lifted about 1,200 feet by the Granite Reef Aqueduct; 84 feet by the Salt-Gila Aqueduct; and approximately 1,600 feet by the Tucson Aqueduct. Electrical power for pumping the water will be supplied by the Navajo Generating Station near Page, Arizona. The Federal Government owns 24.3 percent of the power produced at this facility, expressly for CAP pumping purposes. The power will be transmitted over new and existing power lines, switchyards, and substations.

(more)



Also planned for construction as part of the project are new and modified dams for providing flood control, dam safety, recreation, regulatory storage for project water, and additional water conservation.

Estimated cost of constructing the CAP, if all authorized features are built, is about \$3.5 billion. Federal expenditures to date are about \$1.3 billion. Approximately 70 percent of the reimbursable costs of the project will be repaid to the Federal Government. Revenues will come from water and power sales, and from ad valorem taxes. The Central Arizona Water Conservation District (CAWCD) was established by the State of Arizona as the repayment entity. CAWCD will also operate and maintain the project.

Distribution systems will be built to deliver project water from the main conveyance system to users. The Federal Government will construct all distribution systems for Indian communities. Non-Indian distribution systems may be constructed by the user through private sources or municipal funds, or by Reclamation. If the distribution system is constructed by Reclamation, 20 percent of the system cost must be provided by non-Federal interests, with the Federal Government paying the remainder. The Federal expenditures must be repaid by the water user under terms established through repayment contracts.

Construction of the CAP conveyance system began in May, 1973. Initial project water deliveries will begin to the metropolitan Phoenix area in late 1985, and to the Tucson area in 1991. Deliveries between these two points will occur incrementally as the aqueduct and user distribution systems are completed.

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Attn: Public Affairs Office
P.O. Box 9980
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GRANITE REEF AQUEDUCT

November 1984

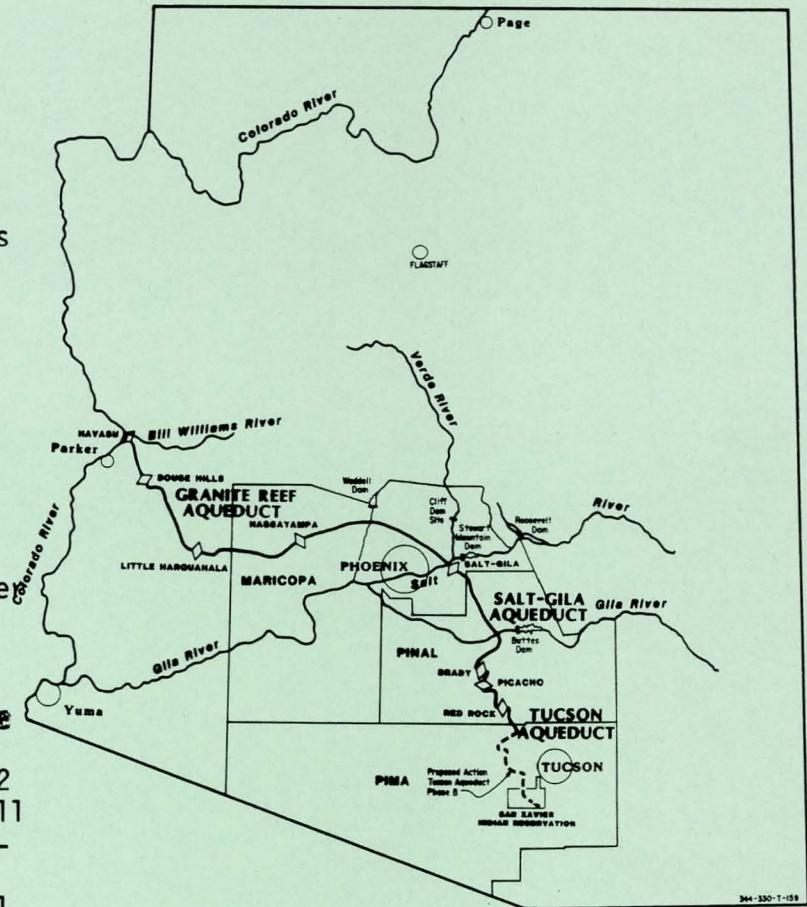
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Except for ongoing cleaning and repair work prior to water delivery, the aqueduct is complete. The four GRA pumping plants are structurally finished; pumps, motors and other internal equipment is currently being installed. Also, turnouts that will deliver project water to user distribution systems are being constructed.

Colorado River water will be lifted 824 feet vertically from Lake Havasu into the GRA. Two 12 foot diameter discharge lines will carry the water from Havasu pumping plant to the Buckskin Mountains Tunnel. The water will flow by gravity between pump stations. It will be relifted three additional times before reaching Phoenix. Total lift between the Colorado River and Phoenix is about 1,200 feet.

With the exception of the first 17 miles of the aqueduct, the GRA will carry 3,000 cubic feet of water per second. The first section of canal has been oversized to provide a small reservoir that will allow operation of Havasu Pumping Plant to be isolated from the rest of the system for operational flexibility.

(more)



Check structures located every 7 to 10 miles along the canal will help regulate water flow through the system. All check structures and pumping plants on the CAP will be operated and controlled by a computer system located at project headquarters in north Phoenix.

GRANITE REEF AQUEDUCT - PHYSICAL FEATURES

Length - 190 miles (174 miles canal, 8.2 miles of tunnel, 7.4 miles of inverted siphon)

<u>Canal</u> (Typical Cross-section)	<u>Reach 1</u>
Top Width - 80 feet	Top width - 132 feet
Bottom Width - 24 feet	Bottom Width - 80 feet
Side Slope - 1.5 to 1	Side Slope - 1.5 to 1
Normal Water Depth - 16.5 feet	Normal Water Depth - 16.5 feet

<u>Crossings</u>	Flume overchutes - 14	Road bridges - 33
	Pipe overchutes - 54	Wildlife crossings - 10

<u>Transmission Facilities</u>	Transmission Lines - 309 circuit miles
	Substations & Switchyards (New) - 6

<u>Pumping Plant</u>	<u>Pumps & Motors</u>	<u>Pump Capacity</u>	<u>Horsepower</u>	<u>Pump Lift</u>
Havasu	6	500 ft ³ /sec	60,000	824 feet
Bouse Hills	10	4 - 510 ft ³ /sec 2 - 260 ft ³ /sec 4 - 130 ft ³ /sec	9,000 4,500 2,250	118 feet
Little Harquahala	10	4 - 510 ft ³ /sec 2 - 260 ft ³ /sec 4 - 130 ft ³ /sec	8,000 4,500 2,250	113 feet
Hassayampa	10	4 - 510 ft ³ /sec 2 - 260 ft ³ /sec 4 - 130 ft ³ /sec	14,000 7,000 3,500	192 feet

<u>Tunnels</u>	<u>Length</u>	<u>Diameter</u>	<u>Shape</u>
Buckskin Mountains	6.8 miles	22 feet	Round
Burnt Mountain	0.6 miles	19.5 feet	Horseshoe
Agua Fria	0.7 miles	19.5 feet	Horseshoe

Siphons - 7 with a total length of 7.4 miles. Six of the siphons are constructed of preformed, prestressed concrete pipe sections. Each section is 22 feet in length, 21 feet in diameter, and weighs up to 225 tons. (Approximately the weight of a 747 jet.)

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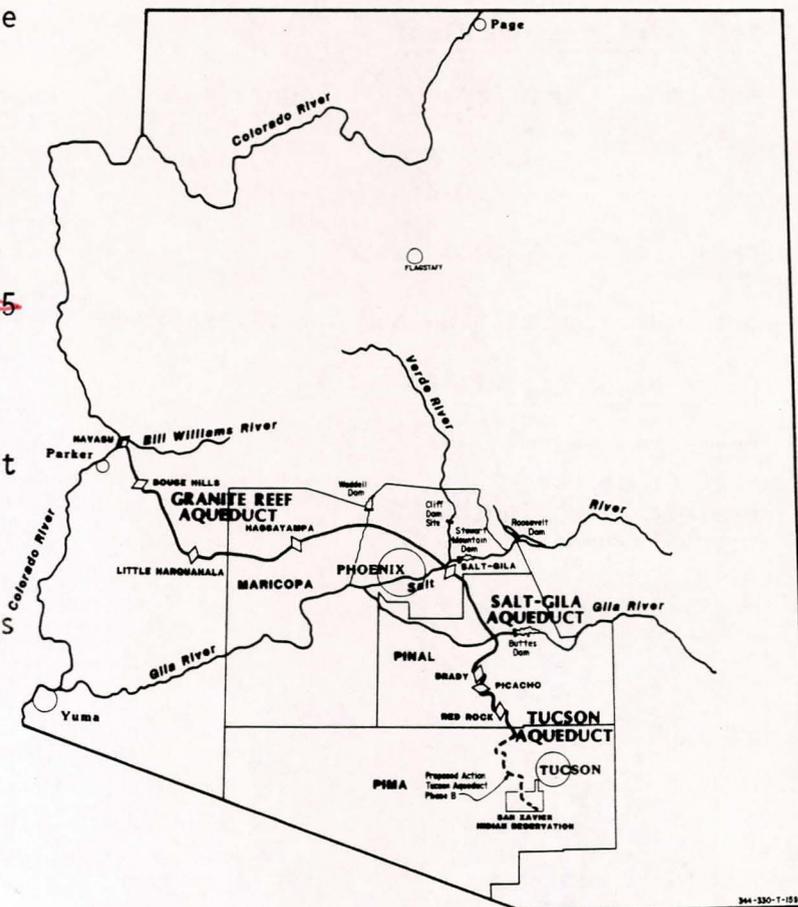
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SALT-GILA AQUEDUCT

NOVEMBER 1984

The Salt-Gila Aqueduct is the second major portion of the CAP water conveyance system, linking the Granite Reef Aqueduct to the west, and Tucson Aqueduct to the south. The aqueduct will provide water to eastern Maricopa, Pinal, and northern Pima County users.

~~With the exception of about 5 miles of canal near Apache Junction, Arizona,~~ The aqueduct is concrete-lined. Placement of control and communications cable, radial gates and control houses at check structures, canal cleaning and repair, and construction of turnout structures is the major work that remains to be accomplished. Initial water deliveries from the aqueduct are planned in late 1986.



SALT-GILA DIVISION - Physical Features

Canal (typical cross-section; canal decreases in size from its beginning to its terminus)

- Length - 58.1 miles
- Capacity - drops from 2,750 cfs to 2,250 cfs
- Top Width - 80 to 78 feet
- Bottom width - 24 to 22 feet
- Side Slopes 1.5 to 1
- Normal Water Depth - 15.75 feet at beginning; 14.5 feet at end.
- Lining: Concrete depth - 3.5 inches

(more)

Gila River Siphon

Length - 0.6 miles
Diameter - 19 feet
Capacity - 2,250 cfs

Salt-Gila Pumping Plant

<u>Motors</u>	<u>Pump Capacity</u>	<u>Horsepower</u>	<u>Pump Lift</u>
10	4 - 450 cfs	5,200	84 feet
	2 - 260 cfs	3,000	
	4 - 130 cfs	1,500	

Power

Spook Hill Substation and 6.5 miles of new 69-kV line.

Other Major Structures

Check Structures - 7
Road Crossings - 31
Drainage Crossings - 56
Wildlife Crossings - 1

Tucson Aqueduct- Phase A - Physical Features

Canal (Typical cross-section decreases in size from its beginning to its terminus)

Length - 42 miles (includes 1,000 feet of siphon under Interstate 10)

Capacity - 2,250 cfs at beginning; 750 cfs at end

Top width - 69 feet to 52 feet

Bottom width - 20 feet to 14 feet

Side slopes - 1.5 to 1

Water Depth - approximately 14 feet to 9.5 feet

Lining: Concrete - 3.5 inches

Tucson Aqueduct - Phase B - (Proposed)

Canal

Length - Approximately 45 miles (30 miles of open canal, and 15 miles of pipeline - including about 5 miles of pipeline for delivering water to the Tucson treatment plant)

Capacity - 650 cfs at beginning; 200 cfs at terminus

Top width - 49.5 feet to 30 feet

Bottom width - 12 feet to 7.5 feet

Side slopes - 1.5 to 1

Water Depth - 9 feet to 5 feet

Pumping Plants - Phase A

	<u>Pumps & Motors</u>	<u>Pump Capacity</u>	<u>Horsepower</u>	<u>Pump Lift</u>
Brady	8	155 cfs	3,500	125 feet
Picacho	6	155 cfs	5,500	198 feet
Red Rock	5	155 cfs	5,500	196 feet

Pumping Plants - Phase B (Proposed)

Six plants 2 with 7 pump units varies from 75 to 281 ft.
 2 with 5 pump units
 1 with 6 pump units
 1 with 4 pump units

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PLAN 6 (Regulatory Storage)

November 1984

"Plan 6" will be constructed as part of the Central Arizona Project to provide regulatory storage and an additional water supply for the project; to provide flood control along the Salt, Verde, Agua Fria, and Gila Rivers; and to resolve safety problems at existing Salt and Verde River dams.

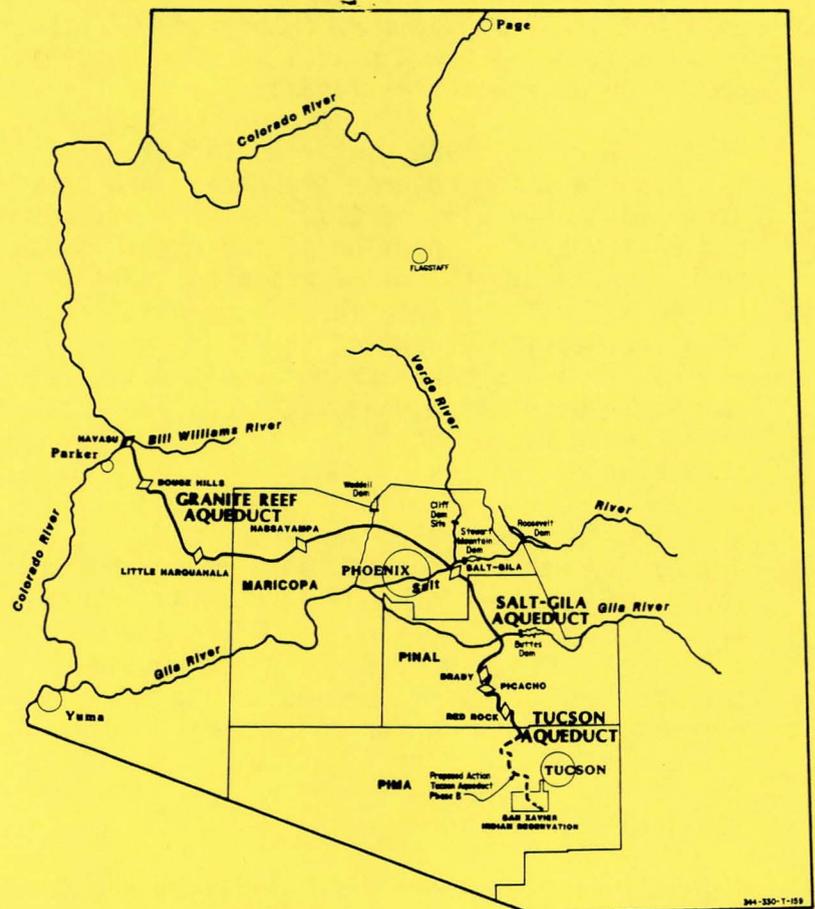
Background

In 1968, Congress authorized construction of Orme Dam, or a suitable alternative, as part of the CAP for regulatory storage and flood control purposes. Public response to a draft Environmental Impact Statement filed on Orme Dam in 1976 indicated substantial environmental, economic, and social concerns regarding the inundation of riparian habitat and a major portion of Fort McDowell Indian Reservation and impacts upon habitat of the endangered bald eagle and other species. These and other concerns, including flooding in the Phoenix metropolitan area, caused the Bureau of Reclamation to reassess Orme Dam, and in 1977 an Interagency Task Force was established to review alternative methods of achieving Orme's authorized purposes.

In 1978, Reclamation initiated the Central Arizona Water Control Study (CAWCS). The study's purpose was to develop plans to solve flood problems in the Phoenix metropolitan area, and provide regulatory storage for Colorado River water brought into Arizona by the CAP.

During the study, the importance of dam safety became increasingly significant. Based on the Reclamation Safety of Dams Act of 1978, Reclamation conducted a study to evaluate the condition of the six Federally-owned dams on the Salt and Verde Rivers. This study revealed that the dams did not meet current design standards for spillway capacity, and that certain modifications were necessary to allow them to safely withstand a major earthquake.

(more)



As solutions were developed to the dam safety problems, it became apparent that they were interrelated with, and, in some cases, identical to the solutions being developed by CAWCS for regulatory storage and flood control. To facilitate development of the most cost-effective solution and streamline the decisionmaking process, the two studies were combined.

In November 1981, the Secretary of the Interior selected Plan 6, one of 8 developed during the CAWCS, as the one preferred for further detailed study by Reclamation because of its strong local support, because it met project objectives, and because it did not have severe social or environmental impacts.

On April 3, 1984, Interior Secretary William Clark approved Plan 6. The Secretary included in the decision a provision to delay preconstruction activities on Cliff Dam for six months to allow further study and review of that portion of the plan. Subsequently, an active eagle's nest was discovered in the proposed Cliff Dam reservoir area, and Reclamation has entered into formal consultation with the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act. The F&WS will determine whether or not construction of Cliff Dam would jeopardize the eagle population, and what reasonable and prudent alternatives could be taken to avoid identified impacts. This may further delay preconstruction activities.

The Secretary also announced that, in accordance with Administration policy for water projects, agreements should be negotiated between the Bureau of Reclamation and CAP beneficiaries to share the added costs arising from the adoption of Plan 6 and to permit its timely completion. In August, 1984, the U.S. Congress passed an amendment to the 1978 Reclamation Safety of Dams Act. The amendment requires a minimum 15 percent cost-sharing for all safety of dams work, including that performed as part of Plan 6.

Physical Description

Constructed under Plan 6 will be New Waddell Dam on the Agua Fria River for regulatory storage, flood control, and recreation; and Cliff Dam on the Verde River for flood control, additional water conservation, recreation, and dam safety. The existing Theodore Roosevelt Dam, located on the Salt River, will be modified to solve dam safety problems and to provide flood control. Stewart Mountain Dam, also located on the Salt River, would be modified as part of the plan to ensure its safety. In addition to the features of Plan 6, the foundation and abutments of Horse Mesa and Mormon Flat Dams, located on the Salt River, and Bartlett Dam, located on the Verde River, would be treated to correct possible instability.

Plan 6 will increase the average annual CAP yield by 137,600 acre-feet. It would limit a 200-year flood event on the Salt River to 92,000 cubic feet per second (cfs) at Sky Harbor International Airport, and reduce the 100-year event to 55,000 cfs. Additional hydropower generation, recreation, and fish and wildlife enhancement will also result from this plan.

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DISTRIBUTION SYSTEMS

March 1984

The Colorado River Basin Project Act of 1968 (Act), which authorized the Central Arizona Project, also authorized the construction of water distribution and drainage facilities for Indian and non-Indian lands to obtain optimum water development and use through improved efficiencies.

NON-INDIAN SYSTEMS

Construction of non-Indian distribution systems was authorized by section 309(b) of the Act. Water service contractors may elect to use private or municipal funding sources to finance construction of their distribution systems, or construct them with the aid of Federal funds. Construction of the systems built with Federal aid will differ from the normal Reclamation process in that substantial participation and contributions from individual water user entities is required.

Construction of the non-Indian distribution facilities was originally envisioned through the Distribution Systems Loan Act. However, in June 1981, Reclamation announced that, in accordance with the President's economic program, no loan funds would be available in the near future. One suggested alternative was for Reclamation to construct the systems under a 9(d) repayment contract. In July 1982, this alternative was expanded to allow for substantial contributions from the water user entities. In December 1982, Public Law 97-373 was enacted, amending the original authorization to provide for price indexing and to require that non-Federal interests contribute a minimum of 20 percent of the cost of non-Indian distribution facilities constructed under this process. This contribution can be in the form of planning the system, providing designs and specifications for construction, providing needed rights-of-way, land appraisal services, and construction management services. Reclamation, however, must approve all plans, designs, and specifications prepared by the water user. Reclamation also issues the specifications, and awards the construction contracts.

The estimated cost of constructing distribution systems for those entities which have expressed an interest in doing so via this process is \$327 million in October 1984 price levels. This will require Federal appropriations of about \$261.6 million. To date, four agricultural districts and one municipal and industrial entity have signed repayment contracts with Reclamation for construction of distribution systems, and 10 additional agricultural districts and one municipal and industrial entity have indicated their plans to do so.

Non-Indian agricultural users of CAP water will pay \$2 an acre-foot for the water, plus a charge for operation, maintenance and replacement costs of the project. That cost, subject to change, is currently \$55 an acre-foot. Currently, the cost of pumping groundwater in the CAP service areas of Maricopa, Pinal and Pima Counties varies from about \$35 to \$70 per acre-foot.

INDIAN DISTRIBUTION SYSTEMS

Twelve Indian communities in the State of Arizona have been allocated CAP water. Construction of distribution systems for these communities was authorized under section 301(a) of the Act.

Reclamation is authorized to plan, design and construct the distribution systems for the Indian communities. However, it is likely that some of the communities will design and construct their own systems under Public Law 93-638, the Indian Self-Determination and Education Assistance Act. The entire cost of designing and constructing these systems will be from Federally appropriated funds for CAP.

On distribution systems built for Indian communities, only that part of the system used for delivering CAP water for municipal and industrial use is subject to repayment. For that portion of the system delivering agricultural water, repayment is deferred under the Leavitt Act in accordance with Section 402 of the Colorado River Basin Project Act. Indian communities are also expected to pay operation, maintenance, and replacement costs associated with the project.

June 24, 1985

CAP Status

- Entire Granite Reef Aqueduct, 190 miles from Colorado River to Salt River, is complete. All four pumping plants on the aqueduct are structurally complete. All but two of the 36 pump units in those four plants (see data sheet) are completely installed. Currently, we are pump testing in all four plants, moving Colorado River water through the Granite Reef Aqueduct as we do so. Colorado River water is being moved to the Salt-Gila Pumping Plant, 20 miles east of Phoenix, so initial pump testing can begin there later this summer.

- The Salt-Gila Aqueduct is essentially complete. Work remains on the installation of check structures (which control the flow of water through the aqueduct), and on turnout structures (which are the areas where water is released from the Salt-Gila to user distribution systems for eventual delivery). The canal must also be cleaned and any cracks in the concrete repaired before water can be pumped into the canal.

- Tucson Aqueduct. About 28 miles of canal and three pumping plants -- Brady, Picacho, Red Rock -- now under construction. Another 13 miles of canal south of Red Rock will be under construction later this fall.

On the last portion of the Tucson Aqueduct, the approximately 45 miles long, we will file the Final Environmental Impact Statement in August. We expect to have a final router for this section of canal approved by the Secretary of the Interior in late fall. Construction could then begin in 1986.

- Plan 6. Pre-construction activities (essentially data-gathering activities that allow us to prepare final designs and specifications for performing the identified work) are underway on New Waddell, Stewart Mountain, and Roosevelt Dams. No activity is currently underway on Cliff Dam pending resolution of questions concerning the dam's impact on the endangered desert bald eagle. An opinion of the dam's impact is expected from the U.S. Fish and Wildlife Service in August. Although no construction of any of the dams is expected to begin before 1987 at the earliest, we currently plan to award a contract for relocation of Lake Pleasant Road late this year.

- Distribution Systems. Three entities (Harquahala Valley Irrigation District, New Magma I. D., and Chapparal City Water Co./Fountain Hills) now have distribution systems underway. The Cities of Phoenix, Mesa and Peoria are also building water treatment plants adjacent to the CAP canal.

WATER DELIVERIES

- the first CAP water delivery was made to the Harquahala Valley Irrigation District, 65 miles west of Phoenix, on May 22, 1985. This delivery, still continuing, is considered to be on an "interruptible basis." That is, if the water is not available when the District wants it, we are under no obligation to deliver it. "Firm" water deliveries, or water deliveries that can be definitely scheduled by a user, are expected to begin this December from the Granite Reef Aqueduct, and in 1986 from the Salt-Gila Aqueduct. As construction of the project continues toward Tucson, water deliveries are expected to be made from a section of canal as soon as it is available. Water deliveries to Tucson are expected by 1991.

WATER SERVICE SUBCONTRACTING

- 34 of the 71 M&I allottees have signed contracts for CAP water. This represents about 410,000 acre-feet, or 64.1 percent of the total M&I allocation. Four M&I allottees, with a total of 19,500 acre-feet, have declined to sign contracts.

- 10 of the 23 agricultural allottees have signed water service subcontracts. This represents about 71 percent of the non-Indian agricultural allotment. Four allottees in this category have declined to sign contracts. Their total percent of the non-Indian agricultural allocation is about 3 percent.

- Eleven of the twelve Indian communities allocated CAP water have signed contracts.

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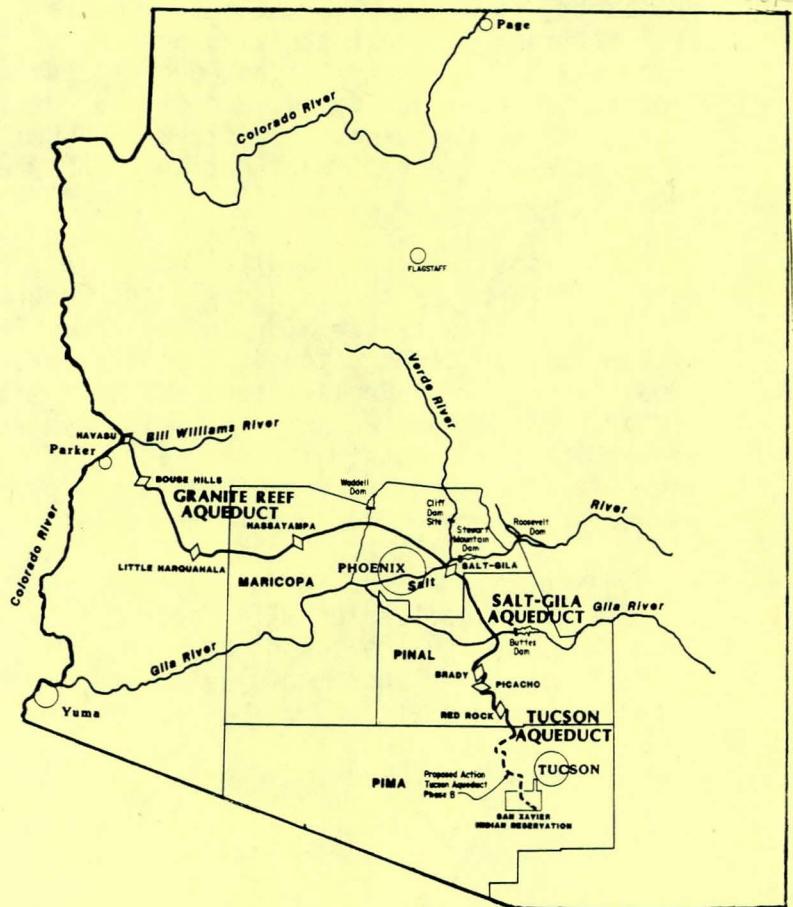
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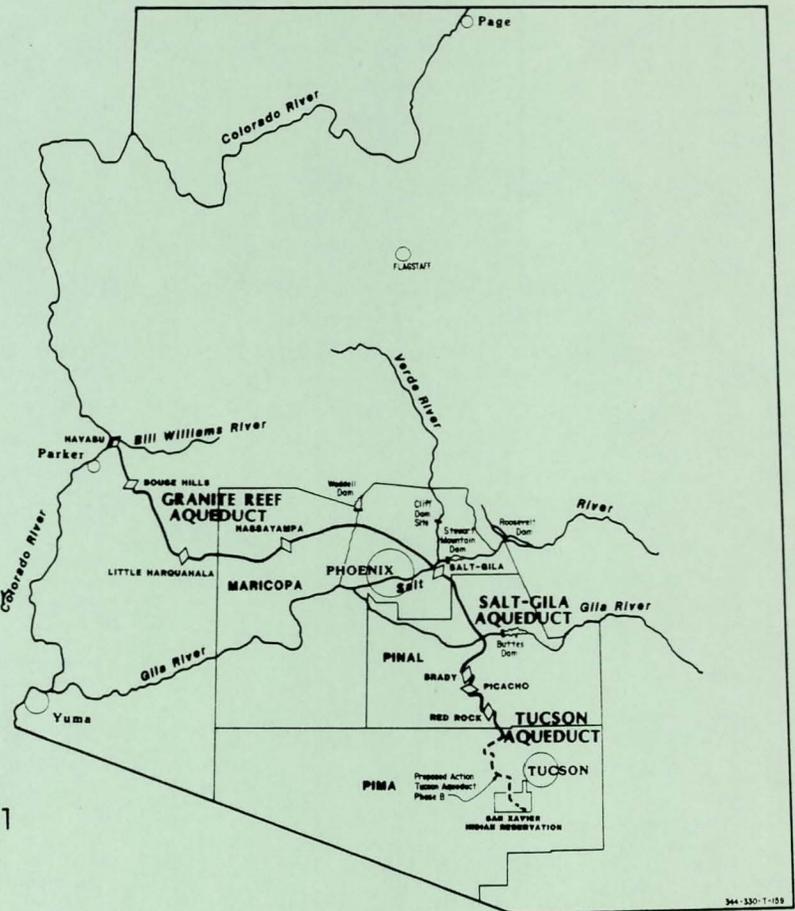
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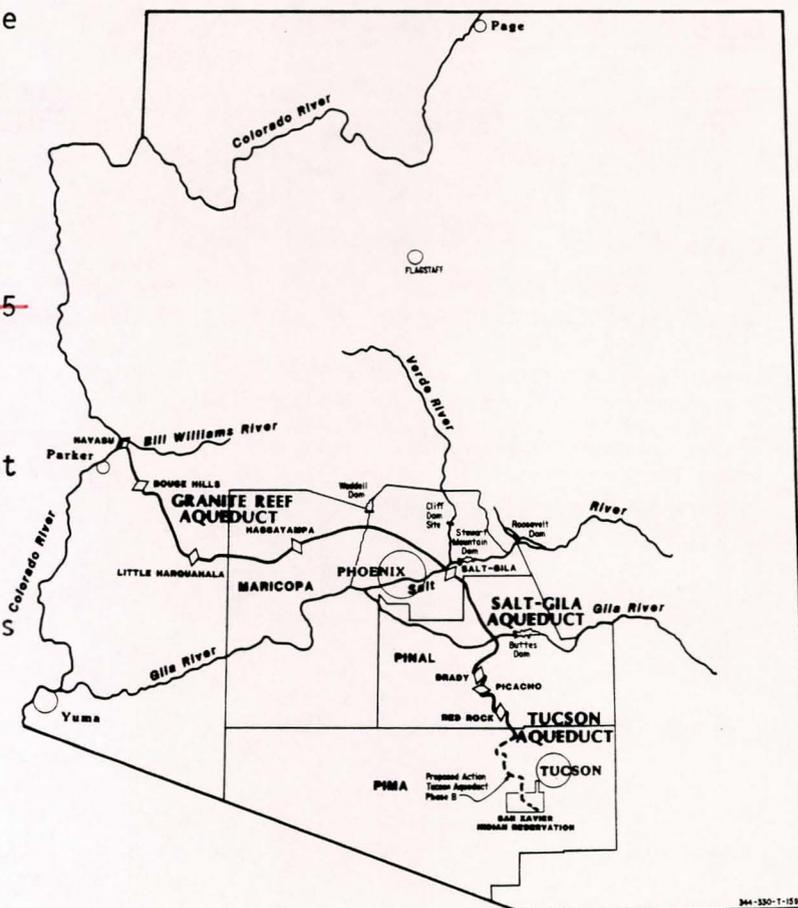
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The Salt-Gila Aqueduct is the second major portion of the CAP water conveyance system, linking the Granite Reef Aqueduct to the west, and Tucson Aqueduct to the south. The aqueduct will provide water to eastern Maricopa, Pinal, and northern Pima County users.

~~With the exception of about 5 miles of canal near Apache Junction, Arizona,~~ the aqueduct is concrete-lined. Placement of control and communications cable, radial gates and control houses at check structures, canal cleaning and repair, and construction of turnout structures is the major work that remains to be accomplished. Initial water deliveries from the aqueduct are planned in late 1986.



SALT-GILA DIVISION - Physical Features

Canal (typical cross-section; canal decreases in size from its beginning to its terminus)

- Length - 58.1 miles
- Capacity - drops from 2,750 cfs to 2,250 cfs
- Top Width - 80 to 78 feet
- Bottom width - 24 to 22 feet
- Side Slopes 1.5 to 1
- Normal Water Depth - 15.75 feet a beginning; 14.5 feet at end.
- Lining: Concrete depth - 3.5 inches

(more)

Gila River Siphon

Length - 0.6 miles
Diameter - 19 feet
Capacity - 2,250 cfs

Salt-Gila Pumping Plant

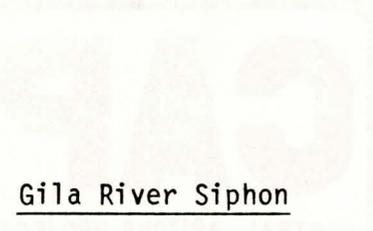
<u>Motors</u>	<u>Pump Capacity</u>	<u>Horsepower</u>	<u>Pump Lift</u>
10	4 - 450 cfs	5,200	84 feet
	2 - 260 cfs	3,000	
	4 - 130 cfs	1,500	

Power

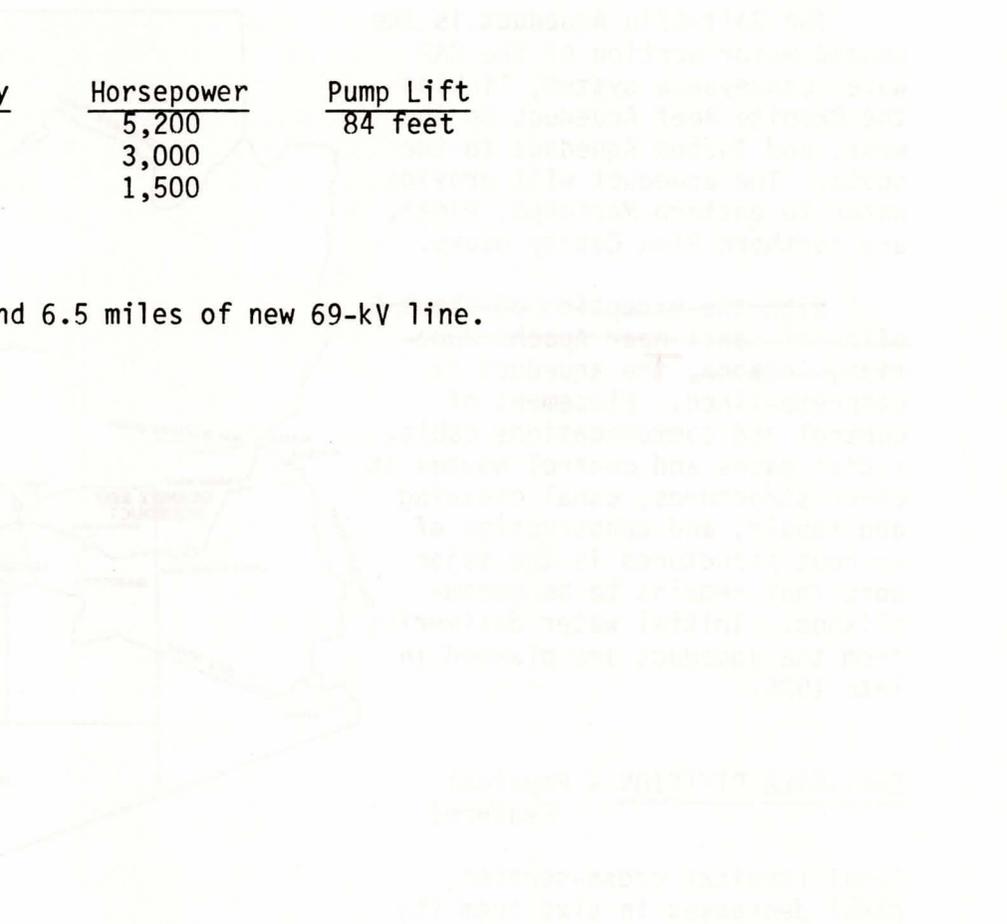
Spook Hill Substation and 6.5 miles of new 69-kV line.

Other Major Structures

Check Structures - 7
Road Crossings - 31
Drainage Crossings - 56
Wildlife Crossings - 1



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FACT SHEET

TUCSON AQUEDUCT

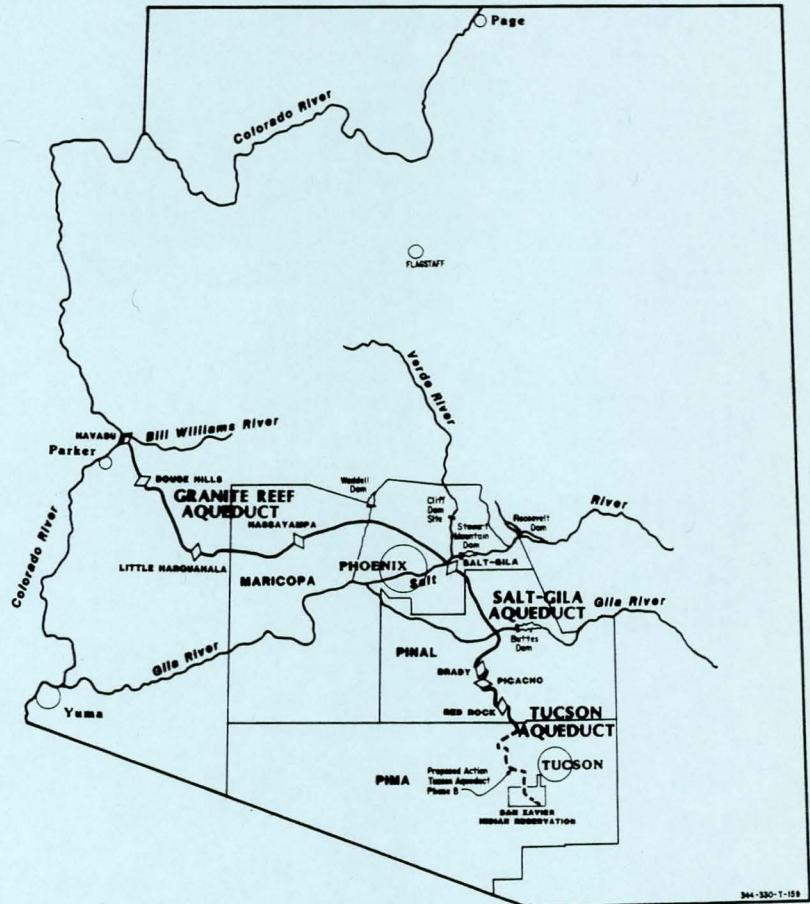
November 1984

The Tucson Aqueduct is the final leg of the Central Arizona Project's 330-mile long main conveyance system. It will receive project water from the Salt-Gila Aqueduct, which begins at the Salt River east of Phoenix 58 miles to the north. The first leg of the CAP, the 190-mile long Granite Reef Aqueduct, runs from the Colorado River at Lake Havasu to tie in with the Salt-Gila.

Routing of the first 42 miles of the Tucson Aqueduct, called Phase A, is complete. ~~Three~~ ^{FIVE} contracts have been awarded for construction of initial Phase A features: the first ~~4.9~~ ^{4.25} miles of the aqueduct, and Picacho, and Brady Pumping Plants. Remaining Phase A features--one pumping plant and about 35.5 miles of canal--will be awarded in Fiscal Year 1985.

and Red Rock

A route for Phase B, the final 45 miles of the Tucson Aqueduct, has not yet been selected. Reclamation has identified a route through Avra Valley and west of the Tucson Mountains as the proposed location of this part of the aqueduct. However, selection of a route will not be made until after the final Environmental Impact Statement on Phase B is filed in August 1985.



(more)

Tucson Aqueduct- Phase A - Physical Features

Canal (Typical cross-section decreases in size from its beginning to its terminus)

Length - 42 miles (includes 1,000 feet of siphon under Interstate 10)

Capacity - 2,250 cfs at beginning; 750 cfs at end

Top width - 69 feet to 52 feet

Bottom width - 20 feet to 14 feet

Side slopes - 1.5 to 1

Water Depth - approximately 14 feet to 9.5 feet

Lining: Concrete - 3.5 inches

Tucson Aqueduct - Phase B - (Proposed)

Canal

Length - Approximately 45 miles (30 miles of open canal, and 15 miles of pipeline - including about 5 miles of pipeline for delivering water to the Tucson treatment plant)

Capacity - 650 cfs at beginning; 200 cfs at terminus

Top width - 49.5 feet to 30 feet

Bottom width - 12 feet to 7.5 feet

Side slopes - 1.5 to 1

Water Depth - 9 feet to 5 feet

Pumping Plants - Phase A

	<u>Pumps & Motors</u>	<u>Pump Capacity</u>	<u>Horsepower</u>	<u>Pump Lift</u>
Brady	8	155 cfs	3,500	125 feet
Picacho	6	155 cfs	5,500	198 feet
Red Rock	5	155 cfs	5,500	196 feet

Pumping Plants - Phase B (Proposed)

Six plants 2 with 7 pump units varies from 75 to 281 ft.
 2 with 5 pump units
 1 with 6 pump units
 1 with 4 pump units

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ARIZONA PROJECTS OFFICE



FACT SHEET

PLAN 6 (Regulatory Storage)

November 1984

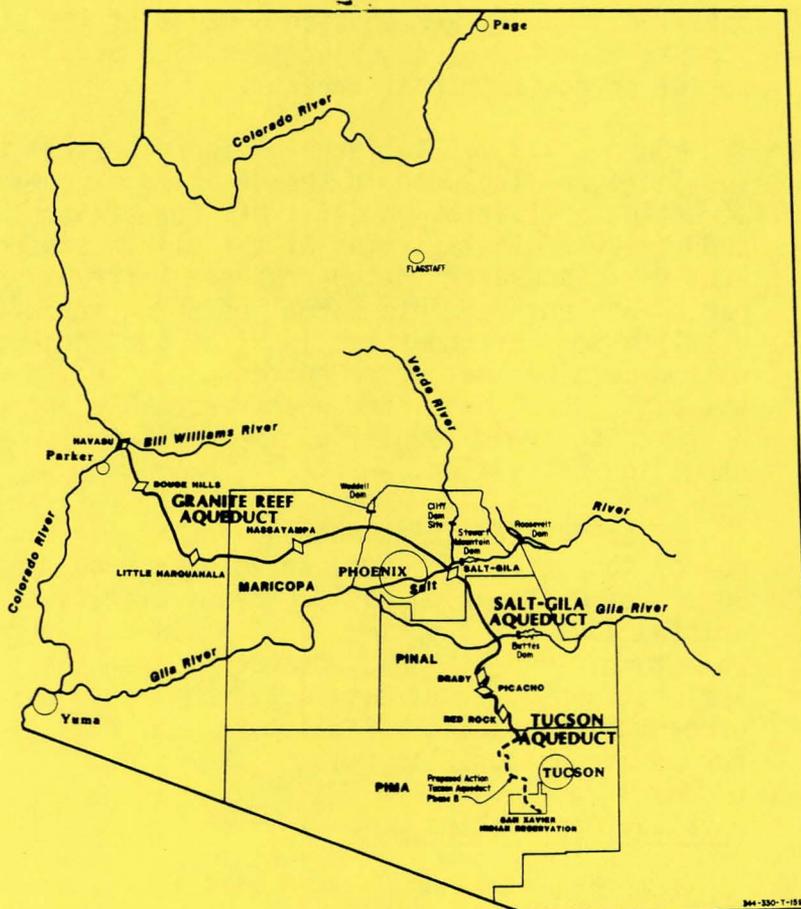
"Plan 6" will be constructed as part of the Central Arizona Project to provide regulatory storage and an additional water supply for the project; to provide flood control along the Salt, Verde, Agua Fria, and Gila Rivers; and to resolve safety problems at existing Salt and Verde River dams.

Background

In 1968, Congress authorized construction of Orme Dam, or a suitable alternative, as part of the CAP for regulatory storage and flood control purposes. Public response to a draft Environmental Impact Statement filed on Orme Dam in 1976 indicated substantial environmental, economic, and social concerns regarding the inundation of riparian habitat and a major portion of Fort McDowell Indian Reservation and impacts upon habitat of the endangered bald eagle and other species. These and other concerns, including flooding in the Phoenix metropolitan area, caused the Bureau of Reclamation to reassess Orme Dam, and in 1977 an Interagency Task Force was established to review alternative methods of achieving Orme's authorized purposes.

In 1978, Reclamation initiated the Central Arizona Water Control Study (CAWCS). The study's purpose was to develop plans to solve flood problems in the Phoenix metropolitan area, and provide regulatory storage for Colorado River water brought into Arizona by the CAP.

During the study, the importance of dam safety became increasingly significant. Based on the Reclamation Safety of Dams Act of 1978, Reclamation conducted a study to evaluate the condition of the six Federally-owned dams on the Salt and Verde Rivers. This study revealed that the dams did not meet current design standards for spillway capacity, and that certain modifications were necessary to allow them to safely withstand a major earthquake.



(more)

As solutions were developed to the dam safety problems, it became apparent that they were interrelated with, and, in some cases, identical to the solutions being developed by CAWCS for regulatory storage and flood control. To facilitate development of the most cost-effective solution and streamline the decisionmaking process, the two studies were combined.

In November 1981, the Secretary of the Interior selected Plan 6, one of 8 developed during the CAWCS, as the one preferred for further detailed study by Reclamation because of its strong local support, because it met project objectives, and because it did not have severe social or environmental impacts.

On April 3, 1984, Interior Secretary William Clark approved Plan 6. The Secretary included in the decision a provision to delay preconstruction activities on Cliff Dam for six months to allow further study and review of that portion of the plan. Subsequently, an active eagle's nest was discovered in the proposed Cliff Dam reservoir area, and Reclamation has entered into formal consultation with the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act. The F&WS will determine whether or not construction of Cliff Dam would jeopardize the eagle population, and what reasonable and prudent alternatives could be taken to avoid identified impacts. This may further delay preconstruction activities.

The Secretary also announced that, in accordance with Administration policy for water projects, agreements should be negotiated between the Bureau of Reclamation and CAP beneficiaries to share the added costs arising from the adoption of Plan 6 and to permit its timely completion. In August, 1984, the U.S. Congress passed an amendment to the 1978 Reclamation Safety of Dams Act. The amendment requires a minimum 15 percent cost-sharing for all safety of dams work, including that performed as part of Plan 6.

Physical Description

Constructed under Plan 6 will be New Waddell Dam on the Agua Fria River for regulatory storage, flood control, and recreation; and Cliff Dam on the Verde River for flood control, additional water conservation, recreation, and dam safety. The existing Theodore Roosevelt Dam, located on the Salt River, will be modified to solve dam safety problems and to provide flood control. Stewart Mountain Dam, also located on the Salt River, would be modified as part of the plan to ensure its safety. In addition to the features of Plan 6, the foundation and abutments of Horse Mesa and Mormon Flat Dams, located on the Salt River, and Bartlett Dam, located on the Verde River, would be treated to correct possible instability.

Plan 6 will increase the average annual CAP yield by 137,600 acre-feet. It would limit a 200-year flood event on the Salt River to 92,000 cubic feet per second (cfs) at Sky Harbor International Airport, and reduce the 100-year event to 55,000 cfs. Additional hydropower generation, recreation, and fish and wildlife enhancement will also result from this plan.

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DISTRIBUTION SYSTEMS

March 1984

The Colorado River Basin Project Act of 1968 (Act), which authorized the Central Arizona Project, also authorized the construction of water distribution and drainage facilities for Indian and non-Indian lands to obtain optimum water development and use through improved efficiencies.

NON-INDIAN SYSTEMS

Construction of non-Indian distribution systems was authorized by section 309(b) of the Act. Water service contractors may elect to use private or municipal funding sources to finance construction of their distribution systems, or construct them with the aid of Federal funds. Construction of the systems built with Federal aid will differ from the normal Reclamation process in that substantial participation and contributions from individual water user entities is required.

Construction of the non-Indian distribution facilities was originally envisioned through the Distribution Systems Loan Act. However, in June 1981, Reclamation announced that, in accordance with the President's economic program, no loan funds would be available in the near future. One suggested alternative was for Reclamation to construct the systems under a 9(d) repayment contract. In July 1982, this alternative was expanded to allow for substantial contributions from the water user entities. In December 1982, Public Law 97-373 was enacted, amending the original authorization to provide for price indexing and to require that non-Federal interests contribute a minimum of 20 percent of the cost of non-Indian distribution facilities constructed under this process. This contribution can be in the form of planning the system, providing designs and specifications for construction, providing needed rights-of-way, land appraisal services, and construction management services. Reclamation, however, must approve all plans, designs, and specifications prepared by the water user. Reclamation also issues the specifications, and awards the construction contracts.

The estimated cost of constructing distribution systems for those entities which have expressed an interest in doing so via this process is \$327 million in October 1984 price levels. This will require Federal appropriations of about \$261.6 million. To date, four agricultural districts and one municipal and industrial entity have signed repayment contracts with Reclamation for construction of distribution systems, and 10 additional agricultural districts and one municipal and industrial entity have indicated their plans to do so.

Non-Indian agricultural users of CAP water will pay \$2 an acre-foot for the water, plus a charge for operation, maintenance and replacement costs of the project. That cost, subject to change, is currently \$55 an acre-foot. Currently, the cost of pumping groundwater in the CAP service areas of Maricopa, Pinal and Pima Counties varies from about \$35 to \$70 per acre-foot.

INDIAN DISTRIBUTION SYSTEMS

Twelve Indian communities in the State of Arizona have been allocated CAP water. Construction of distribution systems for these communities was authorized under section 301(a) of the Act.

Reclamation is authorized to plan, design and construct the distribution systems for the Indian communities. However, it is likely that some of the communities will design and construct their own systems under Public Law 93-638, the Indian Self-Determination and Education Assistance Act. The entire cost of designing and constructing these systems will be from Federally appropriated funds for CAP.

On distribution systems built for Indian communities, only that part of the system used for delivering CAP water for municipal and industrial use is subject to repayment. For that portion of the system delivering agricultural water, repayment is deferred under the Leavitt Act in accordance with Section 402 of the Colorado River Basin Project Act. Indian communities are also expected to pay operation, maintenance, and replacement costs associated with the project.

June 24, 1985

CAP Status

- Entire Granite Reef Aqueduct, 190 miles from Colorado River to Salt River, is complete. All four pumping plants on the aqueduct are structurally complete. All but two of the 36 pump units in those four plants (see data sheet) are completely installed. Currently, we are pump testing in all four plants, moving Colorado River water through the Granite Reef Aqueduct as we do so. Colorado River water is being moved to the Salt-Gila Pumping Plant, 20 miles east of Phoenix, so initial pump testing can begin there later this summer.

- The Salt-Gila Aqueduct is essentially complete. Work remains on the installation of check structures (which control the flow of water through the aqueduct), and on turnout structures (which are the areas where water is released from the Salt-Gila to user distribution systems for eventual delivery). The canal must also be cleaned and any cracks in the concrete repaired before water can be pumped into the canal.

-- Tucson Aqueduct. About 28 miles of canal and three pumping plants -- Brady, Picacho, Red Rock -- now under construction. Another 13 miles of canal south of Red Rock will be under construction later this fall.

On the last portion of the Tucson Aqueduct, the approximately 45 miles long, we will file the Final Environmental Impact Statement in August. We expect to have a final route for this section of canal approved by the Secretary of the Interior in late fall. Construction could then begin in 1986.

- Plan 6. Pre-construction activities (essentially data-gathering activities that allow us to prepare final designs and specifications for performing the identified work) are underway on New Waddell, Stewart Mountain, and Roosevelt Dams. No activity is currently underway on Cliff Dam pending resolution of questions concerning the dam's impact on the endangered desert bald eagle. An opinion of the dam's impact is expected from the U.S. Fish and Wildlife Service in August. Although no construction of any of the dams is expected to begin before 1987 at the earliest, we currently plan to award a contract for relocation of Lake Pleasant Road late this year.

- Distribution Systems. Three entities (Harquahala Valley Irrigation District, New Magma I. D., and Chapparal City Water Co./Fountain Hills) now have distribution systems underway. The Cities of Phoenix, Mesa and Peoria are also building water treatment plants adjacent to the CAP canal.

WATER DELIVERIES

- the first CAP water delivery was made to the Harquahala Valley Irrigation District, 65 miles west of Phoenix, on May 22, 1985. This delivery, still continuing, is considered to be on an "interruptible basis." That is, if the water is not available when the District wants it, we are under no obligation to deliver it. "Firm" water deliveries, or water deliveries that can be definitely scheduled by a user, are expected to begin this December from the Granite Reef Aqueduct, and in 1986 from the Salt-Gila Aqueduct. As construction of the project continues toward Tucson, water deliveries are expected to be made from a section of canal as soon as it is available. Water deliveries to Tucson are expected by 1991.

WATER SERVICE SUBCONTRACTING

- 34 of the 71 M&I allottees have signed contracts for CAP water. This represents about 410,000 acre-feet, or 64.1 percent of the total M&I allocation. Four M&I allottees, with a total of 19,500 acre-feet, have declined to sign contracts.

- 10 of the 23 agricultural allottees have signed water service subcontracts. This represents about 71 percent of the non-Indian agricultural allotment. Four allottees in this category have declined to sign contracts. Their total percent of the non-Indian agricultural allocation is about 3 percent.

- Eleven of the twelve Indian communities allocated CAP water have signed contracts.