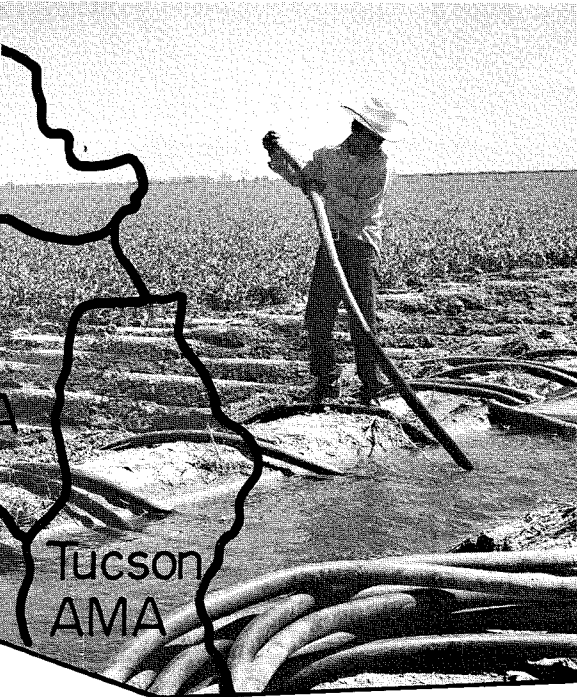
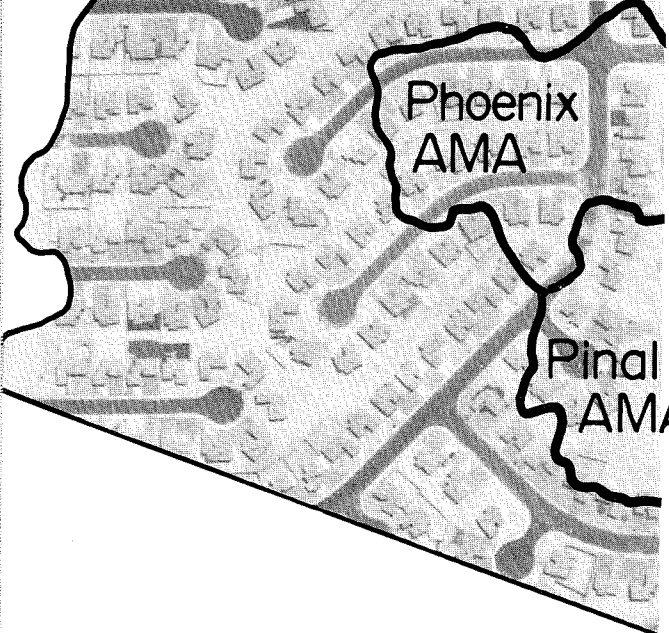
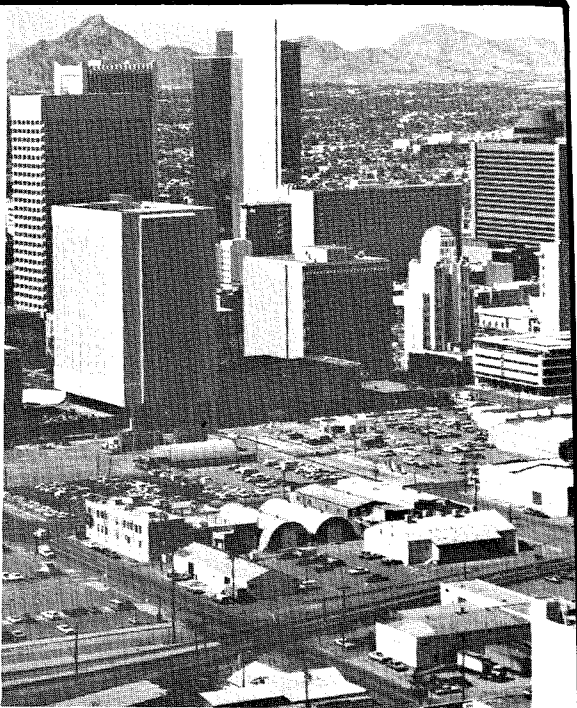
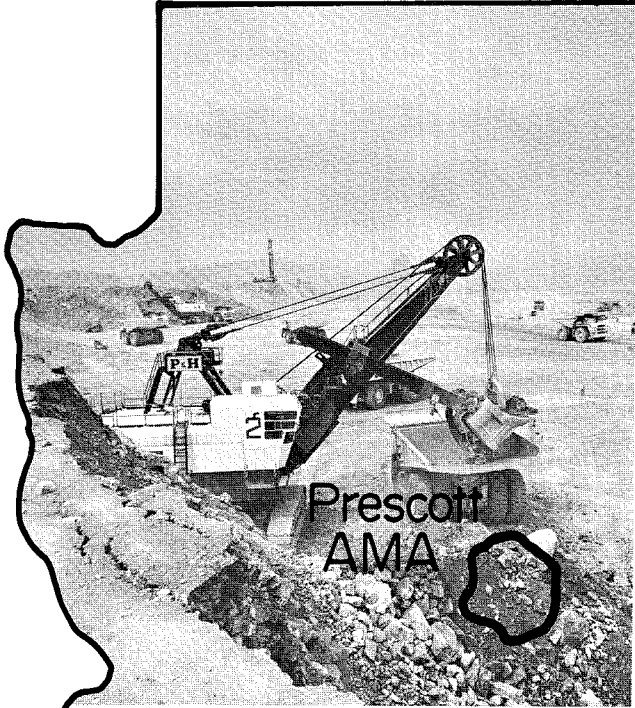
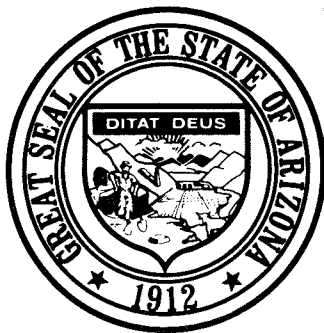


Arizona Department of Water Resources 1980-1981 Annual Report



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cover:
Municipalities, mines, agriculture and new development are all affected by Arizona's 1980 Groundwater Management Act, which established the Prescott, Phoenix, Pinal and Tucson Active Management Areas.

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State of Arizona

DEPARTMENT OF WATER RESOURCES

99 E. Virginia Avenue, Phoenix, Arizona 85004



BRUCE BABBITT, Governor
WESLEY E. STEINER, Director

The Honorable Bruce Babbitt
Governor, State of Arizona
and
Honorable Members of the Legislature
State Capitol
Phoenix, Arizona

Gentlemen:

The Arizona Department of Water Resources submits its annual report for the fiscal year July 1, 1980 through June 30, 1981.

In the spring of 1980, a landmark piece of legislation was enacted by our state lawmakers: the Groundwater Management Act. I say landmark because, as far as I know, it is the most advanced, comprehensive piece of water legislation on the books in the country today.

The Groundwater Act seeks to correct Arizona's principal water problem: the imbalance between renewable water supply and consumption. The law is designed to balance the groundwater basins in the Phoenix, Prescott, Tucson and Pinal Active Management Areas over a 45-year period through a succession of conservation management plans.

The constitutionality of the groundwater code is being tested in several major lawsuits in state and federal courts, and I suspect this is only the beginning of a long series of legal challenges. Nevertheless, I remain confident that Arizona will continue to be a forerunner in the field of water management, because we must manage our groundwater effectively if our citizens are to be assured a continuing vibrant economy and an adequate standard of living. It is the over-mining of our groundwater reserves, not the new law, that threatens central Arizona's economy and livelihood.

The new groundwater code has added vast, new responsibilities to this agency. We have had to assimilate the tasks of establishing grandfathered groundwater rights, developing the management plans and hearing and enforcing violations of the groundwater code, while still maintaining responsibility for statewide water planning, flood control, dam safety, hydrologic data collection and other important functions.

We are suffering growing pains, but we are making progress. The staff knows our mission is extremely important; Arizona's future depends upon the quantity and quality of our water supplies. We also realize we cannot do the job alone. We must educate all Arizonans to instill in them an understanding and appreciation of the need to conserve water in this arid state.

This year's report reflects the organizational changes that have been made to assimilate our new responsibilities. The report follows our new organizational chart; all functions fall within three major divisions: Administration, Water Management, and Engineering. We have highlighted our most important activities and have added useful information for the general public.

Sincerely,

Wesley E. Steiner
Director



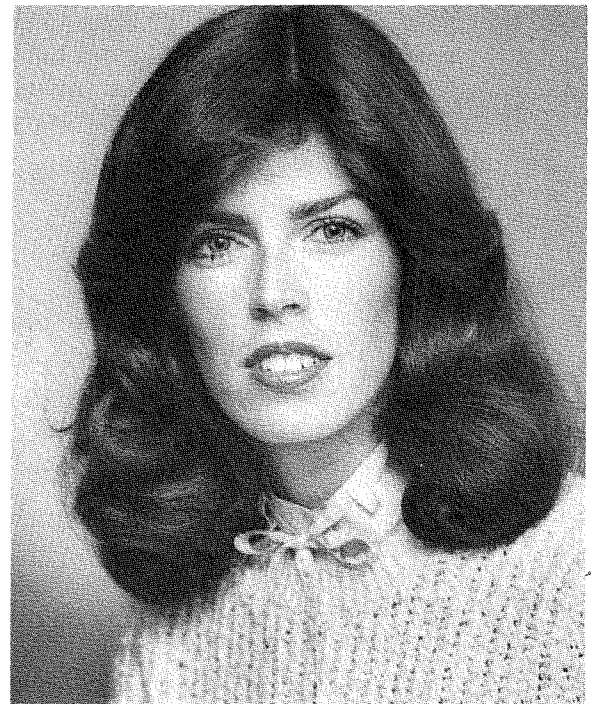
Wesley E. Steiner
Director



Don Maughan
Deputy Director
Water Management



Phil Briggs
Deputy Director
Engineering



Kathy Ferris
Chief Legal Counsel

Introduction

We'd like to introduce ourselves. With the passage of the Groundwater Management Act June 12, 1980, the Arizona Water Commission became the Arizona Department of Water Resources. Governor Babbitt appointed Wesley Steiner Director of the agency, and the seven member Water Commission became an advisory board to the Department. But, let's back up a bit and take a brief look at our predecessor agencies and administration of water law in Arizona.

History

In 1948, the Arizona Legislature established the Arizona Interstate Stream Commission and gave it authority to plan for and protect the use of interstate waters. The Commission's primary task was to prepare Arizona's case before the U.S. Supreme Court in the battle with California over the waters of the Colorado River. Arizona's victory in *Arizona v. California*, a lawsuit still going on today, led to the Congressional authorization of the Central Arizona Project. The administration of water rights and the Critical Groundwater Code were functions of the State Land Department.

The Arizona Water Commission came into being in 1971 during Governor Williams' term, and was granted all state water responsibilities, except the administration of water rights and the regulation of water quality. It was also held responsible for overseeing the safety of all non-federal dams. The Commission was headed by Wesley Steiner who also served as State Water Engineer.

In 1979, the Legislature adopted a recommendation of the Groundwater Management Study Commission and transferred the responsibilities of water rights and groundwater administration to the Water Commission. This change meant the Water Commission had jurisdiction over all matters of water planning and regulation except in the area of water quality. That function has historically been a responsibility of the State Health Department.

Organization

The Department of Water Resources is composed of three divisions: Administration, Engineering and Water Management. The organizational chart on the adjacent page illustrates these three divisions, their subdivisions and the functions performed by each. For your convenience, the chart also provides the names of our deputy directors and subdivision chiefs and their telephone numbers.

Responsibilities

The annual report summarizes the major responsibilities of this agency; however, it is impossible to tell our whole story in this concise report. Therefore, the following is a brief description of some other important programs in which we are involved.

Technical Advisory Committee for Population Projections

The DWR is a member of the Technical Advisory Committee on Population Projections, which reviews and approves population projections and estimates prepared by the Arizona Department of Economic Security. Once approved by this Committee, these projections become the official state data used for all planning purposes.

Power Plant and Transmission Line Siting Committee

The DWR is one of 11 state agencies that participate in the 18-member Power Plant and Transmission Line Siting Committee. The Committee grants Certificates of Environmental Compatibility to public utilities to construct transmission lines and substations.

Arizona Mapping Advisory Committee

The DWR is a member of the Arizona State Mapping Advisory Committee (AzMAC). Established by Governor Babbitt in 1979 as part of the State Data Coordination Network, the AzMAC annually submits Arizona's mapping priorities to the U.S. Geological Survey to include in their program, and makes recommendations to the USGS concerning their mapping policies and projects.

Lower Colorado River Management Program Coordinating Committee

The U.S. Bureau of Reclamation administers the Lower Colorado River Management Program, which includes water salvage, salinity control, protection of the environment, preservation and enhancement of fish and wildlife and recreational development from the Colorado River at Davis Dam to the Mexican border. The Arizona Department of Water Resources is one of several state and federal agencies that participate in the Coordinating Committee to help monitor river activities and make recommendations to the Bureau.

Licensing of Weather Modification Activities

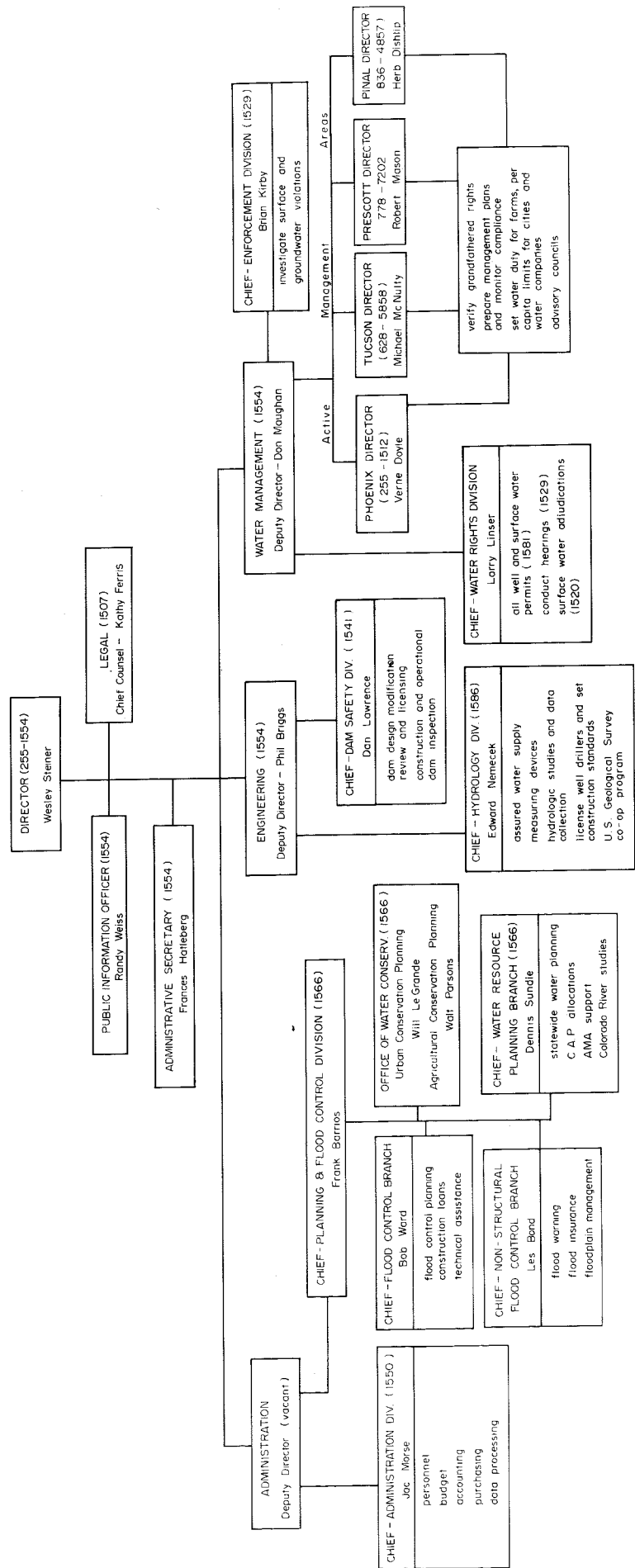
The DWR licenses weather modification activities, although we have no jurisdiction over federal agencies which are exempt from the state requirements. Since 1951 only seven licenses have been issued.

Western States Water Council

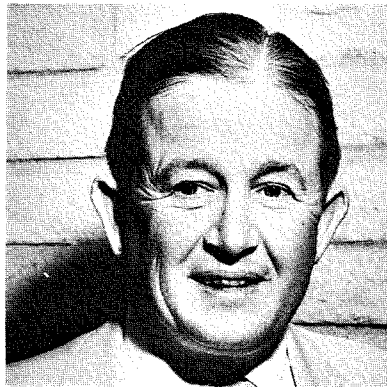
The Western States Water Council was established in 1965 by the Western States Governors' Conference to promote regional understanding and cooperation on water matters. The governors of the eleven contiguous western states and the State of Texas appoint three representatives each to the Council. Arizona's members are attorneys Tom Choules of Yuma, Robert Lundquist of Tucson and Water Resources Director Wesley Steiner. Recently, the Council has strongly advocated the dominant role of the states in water rights administration to the federal government.

We hope this introduction helps clarify who we are and what we do. We invite you to get to know us better in the hope that you will share our enthusiasm for the vital role water plays in our lives. We are always available to answer questions about water issues that concern you.

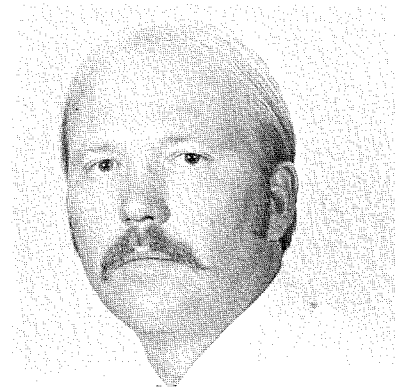
Arizona Department of Water Resources Organizational Chart



Arizona Water Commissioners



Kel M. Fox, Chairman
Coconino County (1/18/82)



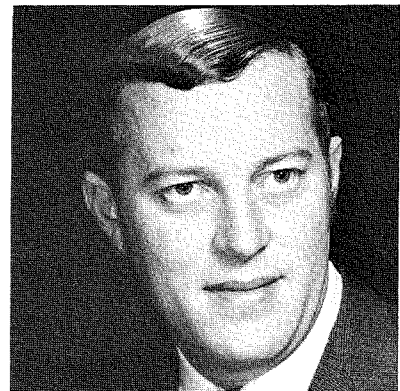
John L. Leiber, Vice Chairman
Pima County (1/18/82)



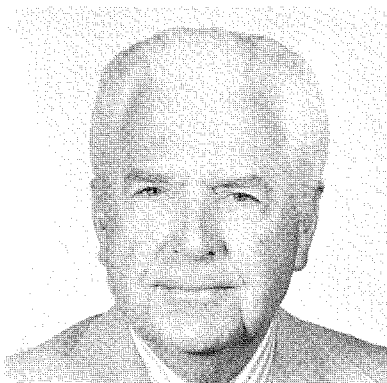
Peter F. Bianco
Pinal County (1/16/84)



Marybeth Carlile
Pima County (1/16/84)



Brian H. Babiars
Yuma County (1/18/86)



W.N. "Jack" Shawver
Maricopa County (1/18/86)



R.J. Pursley
Maricopa County (1/18/86)

Ex officio members Joe Fallini, State Land Commissioner, and Marshall Humphrey, Chairman of the Arizona Power Authority, are not shown. The date in parenthesis after each name indicates when the member's term expires.

Water Management

1980 Groundwater Management Act

On June 12, 1980, Governor Bruce Babbitt signed into law the Arizona Groundwater Management Act. This Act, the product of two and one-half years of work by the Arizona Groundwater Management Study Commission, is the first comprehensive groundwater management code in the state's history. It is unique in its ambitious approach to groundwater management.

Arizona's major water problem is the imbalance between the water consumed and the dependable supply. A state with less than ten inches of average rainfall, Arizona relies on the water it gets from underground aquifers for over sixty percent of its water supply. Since 1977, Arizonans have been annually consuming approximately 2.5 million acre-feet more groundwater than is replenished by nature. For example, in some areas surrounding Phoenix, groundwater is used thirty times faster than it is replaced. Tucson is using its supply five times as fast as the replenishment rate. To put it another way, Arizona is overdrawing its groundwater bank account to meet the demands of a continually expanding population and economy.

Arizona's groundwater overdraft is not a new problem. Since the early 1930's, state officials knew something needed to be done to regulate groundwater pumping; however, legislators were unable to agree on the method of regulation. As a result, Arizona groundwater law evolved through State Supreme Court decisions on individual disputes. The Court adopted the "rule of reasonable use" to govern withdrawals. Under this rule property owners had the right to use the groundwater beneath their land for reasonable, beneficial purposes on the land, but the water could not be transported off the land from which it was pumped if the transportation adversely affected a neighbor's property.

In 1948, after receiving a warning from the Secretary of the Interior that a groundwater law in Arizona was a prerequisite to Congress authorizing the Central Arizona Project, State Legislators enacted the Critical Groundwater Code during the sixth consecutive special session called for that purpose by Governor Sidney P. Osborn. The code empowered the State Land Department to declare

critical groundwater areas where there was insufficient groundwater to irrigate lands then in cultivation. Although the law prohibited the cultivation of new irrigated acreage in these areas and placed restrictions on new agricultural wells, it did not limit the amount of groundwater that could be pumped by other users.

The Critical Groundwater Code and the rule of reasonable use did not reduce the groundwater overdraft problem. It took another 32 years, a renewed threat to the CAP by Interior Secretary Cecil Andrus and the realization by political forces of the state that the problem was growing more severe, before legislators passed another groundwater law in 1980.

The 1980 Groundwater Management Act established the Arizona Department of Water Resources and made its predecessor, the Arizona Water Commission, an advisory board to the new director. The Department has jurisdiction over groundwater and surface water rights and water management.

The Act established four active management areas (AMA's). These are geographical areas of the state in which intensive groundwater management is needed to bring water consumption and replenishment into balance. The four initial AMA's — Phoenix, Tucson, Pinal and Prescott — include most of the critical areas under the old code. Each AMA has a director appointed by the Water Resources Director, and a five-member citizens' advisory board appointed by the Governor. The first advisory board members are listed below.

Groundwater Users Advisory Councils

Pinal AMA

Harold Arp, Acting Chairman, Casa Grande (Jan., 1984)
Dalton Cole, Jr., Coolidge (Jan., 1982)
Porfirio Pantoja, Eloy (Jan., 1984)
Dewey Powell, Casa Grande (Jan., 1982)

Tucson AMA

Samuel S. Sneller, Chairman, Tucson (Jan., 1982)
John A. Frankovich, Sahuarita (Jan., 1984)
Brad De Spain, Marana (Jan., 1984)
William G. Ealy, Tucson (Jan., 1982)
George Rosenberg, Tucson (Jan., 1986)

Phoenix AMA

Sue Lofgren, Chairwoman, Tempe (Jan., 1986)
John R. Lassen, Phoenix (Jan., 1982)

J. S. Francis, Jr., Peoria (Jan., 1984)
Stanley F. Van de Putte, Glendale (Jan., 1982)
Marvin A. Andrews, Phoenix (Jan., 1984)

Prescott AMA

Jerri Wagner, Chairwoman, Prescott (Jan., 1982)
Jim Lewis, Prescott (Jan., 1982)
Donald R. Head, Prescott (Jan., 1986)
Rink Goswick, Humboldt (Jan., 1984)
Marshall Hartman, Prescott (Jan., 1984)

The date in parenthesis after each name indicates when the member's term expires.

Within these AMA's, the law requires a 45 year water conservation and management program, and it establishes several ways of obtaining the right to use groundwater. Those who pumped or received groundwater prior to June 12, 1980, and who wanted to continue, were required to obtain a grandfathered right. There are three categories of grandfathered rights: (1) Irrigation, (2) Type 1 Non-Irrigation and (3) Type 2 Non-Irrigation. The amount of groundwater which may be used under each right is calculated according to criteria set forth in the law. The statutory deadline to apply for grandfathered rights expires September 14, 1981.*

Another way to obtain the right to use groundwater under the Act is to apply for a groundwater withdrawal permit. Permits may be issued for new uses of groundwater or uses in excess of a person's grandfathered right. There are six types of groundwater withdrawal permits:

- 1) dewatering — for dewatering ore bodies prior to mining activities
- 2) mineral extraction and metallurgical processing
- 3) general industrial use — for all non-irrigation uses, including dairies, feedlots and industries (subdivisions are excluded)
- 4) poor quality groundwater withdrawal — for withdrawing groundwater which has no other beneficial use
- 5) temporary permits
 - a. electrical energy generation — for emergencies which require additional pumping
 - b. dewatering — for temporary uses such as construction projects
- 6) drainage water withdrawal — for draining agricultural land where necessary to allow cultivation

*See Groundwater Management section for more information on grandfathered rights.

Cities, towns, private water companies and irrigation districts may acquire the right to use groundwater. These entities, while still subject to conservation measures, may withdraw as much water as they need to serve customers within their service areas. However, limitations have been placed on extending a service area and providing certain types of service.

The groundwater management program established by the Act relies on mandatory water conservation in the early years to reduce the total annual amount of groundwater withdrawn in the active management areas. Each AMA has a statutory management goal. Prior to each management period, the DWR will develop a management plan for each AMA which will include conservation requirements for all types of water users — agricultural, municipal and industrial. The plans may also include proposals to augment the AMA's water supply. After the year 2006, the state may incorporate a program to purchase and retire grandfathered rights, if such a program is necessary to meet the long-term management goal.

Other management methods set forth in the law are:

- 1) a ban on new irrigated acreage in AMA's. Only land irrigated between January 1, 1975 and January 1, 1980 may be irrigated in the future.*
- 2) curtailing new urban development in areas where there is no assured water supply
- 3) well regulations
- 4) statewide well registration
- 5) the requirement that water measuring devices be installed on all wells with a pump capacity exceeding 35 gallons per minute, which are located inside AMA's and INA's (irrigation non-expansion areas).

With the exception of well registration, domestic wells with a maximum pump capacity of not more than 35 gallons per minute are exempt from most of the requirements of the code.

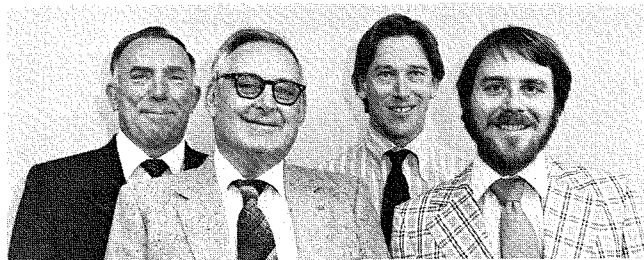
The Act includes provisions regulating the transportation of groundwater from the point of withdrawal to another location. A person who has the right to withdraw groundwater may transport it within a sub-basin without payment of damages.

The law authorizes the DWR to assess a groundwater withdrawal fee for non-exempt wells located in AMA's and INA's to help finance the cost of administering the management program and

*See section on Amendments to the 1980 Groundwater Management Act

enforcing the law. The statutory ceiling is \$5.00 per acre-foot per year.

The enforcement portion of the act requires that groundwater users keep records and submit annual reports to the Department. It also gives the DWR the power to issue cease and desist orders and seek civil and criminal penalties against violators of the code.



The Active Management Area Directors from left to right are: Verne Doyle, Phoenix; Bob Mason, Prescott; Michael McNulty, Tucson; Herb Dishlip, Pinal.

Amendments To The 1980 Groundwater Management Act

In April, 1981, the Arizona Legislature enacted nine amendments to the 1980 Groundwater Management Act. They are summarized below. Eight of these were part of Senate Bill 1409. The last amendment was House Bill 2465.

1. Existing animal industries (dairies, feedlots, etc.) are exempt from the ban on purchasing irrigation rights for non-irrigation use within service areas. These industries may purchase grandfathered, groundwater rights for additional water supply. Any irrigation associated with animal industries is subject to irrigation grandfathered rights requirements.

2. "Irrigation" is defined as any application of water to two or more acres of land to grow plants or parts of plants for sale or human consumption, or for use as animal feed. Only these uses of water are subject to irrigation grandfathered rights requirements.

3. An irrigation grandfathered right may be obtained for any land located inside an active management area, even though that land was not irrigated between January 1, 1975 and January 1, 1980, if it can be demonstrated there was substantial capital investment made to prepare the land for irrigation prior to enactment of the code.* Prior to

*The deadline to file for grandfathered rights expires September 14, 1981.

this amendment, the law prohibited one from seeking the right if the land in question was located in one of the old critical groundwater areas.

4. A state university located inside an active management area may irrigate new agricultural land for research and experimentation, although it is limited in the acreage it may cultivate and the amount of water it may use.

5. Certain irrigation districts may, under specific circumstances, add acres of land that have irrigation grandfathered rights to their service area to replace other acres.

6. Existing animal industries located within three miles of a service area of a city or private water company are exempt from having to obtain denial of service from the city or water company before seeking a general industrial use permit to expand their water use.

7. The Director of Water Resources may designate a service area of a private water company as having an assured water supply before Central Arizona Project water is allocated, if it is probable the company will receive a CAP allocation and if the company agrees to contract for CAP water. This presumes the company is able to satisfy other criteria for the assured supply designation.

8. An individual may drill or modify one exempt well (pump capacity less than 35 gallons per minute) on his own property after obtaining a one-time well license from the Water Resources Department. There is no fee for this temporary license.

9. The Department of Water Resources and the Real Estate Department may exempt some subdivision developments from the assured water supply requirements effective in active management areas if a substantial capital investment was made prior to enactment of the groundwater code. This was a temporary exemption clause which expired June 30, 1981.

Town of Chino Valley v. City of Prescott

In June, 1981, the Arizona Supreme Court agreed to hear the first case challenging the constitutionality of the 1980 Groundwater Management Act. In *Town of Chino Valley, et al. v. The City of Prescott*, the plaintiffs, several landowners in Chino Valley, sought to prohibit the City of Prescott from withdrawing and transporting groundwater from city-owned wells near Chino Valley. The Yavapai County Superior Court dismissed the

plaintiffs' lawsuit which sought an injunction, and they appealed.

The plaintiffs are challenging the constitutionality of provisions of the Groundwater Act which allow Prescott to withdraw and transport groundwater within a groundwater sub-basin without being liable for damages. The plaintiffs claim the Act permits the City of Prescott to take their property without compensation, thus denying them due process of law.

The City of Prescott has argued that the Groundwater Act is a reasonable exercise of the state's police power and is not a taking of plaintiff's property. Numerous parties, including the Department of Water Resources, have filed amicus curiae briefs in support of the constitutionality of the Act. Other amici curiae filed briefs arguing against the constitutionality of the Act. It is hoped the Supreme Court will rule on the case by the end of the year.

Water Management

One of the first provisions of the new groundwater code users in the Phoenix, Prescott, Tucson and Pinal Active Management Areas must comply with is the requirement to file for grandfathered rights to protect past uses of groundwater. September 14, 1981 is the statutory deadline to apply for a Certificate of Grandfathered Right.

The law required the Department to mail approximately 1.2 million notices to registered property owners in the AMAs informing them of their right to apply for a grandfathered right. The notices contained a postcard, which recipients could mail back to the DWR to request application forms. The Department's public information office conducted an intensive publicity campaign, which utilized advertisements, radio and TV public service announcements, brochure distribution and news articles to inform the general public of their rights.

To assist persons filing for grandfathered rights, the Department set up an operations center equipped with toll-free telephone lines and personnel trained to answer questions. Approximately 26,000 telephone calls were recorded. By June 30, 1981, the staff had mailed 63,000 application forms to individuals requesting them.

The groundwater law requires the Department to issue permits for new and replacement wells drilled by cities, towns or private water companies in active management areas. Additionally, individuals must obtain a groundwater withdrawal

permit prior to drilling a well with a pump capacity exceeding 35 gallons per minute. Forty-seven permits were issued during the 1980-81 fiscal year.

All well owners statewide must register their wells, regardless of size, by June 14, 1982. Well registration forms are available at the DWR and the AMA offices. Well owners who filed notices of intent to drill since June 12, 1980, or who received permits for replacement wells or groundwater withdrawal, are not required to register. This fiscal year, 2,539 notices of intention to drill were filed with the Department. The requirement to file a notice of intention to drill, which existed prior to the 1980 code, was strengthened by the new law.

Surface Water

Arizona law defines surface water as that which naturally occurs on the surface — washes, lakes, springs — and underground water that flows in definite channels with beds and banks. The doctrine of prior appropriation or "first in time, first in right" governs the use of surface water, and the Department of Water Resources administers the law by issuing permits and certificates of water use.

During the fiscal year, the Department received 222 applications to appropriate (i.e. put to use) surface water. One hundred and two permits and 31 certificates were issued.

This year the Department developed a water rights claim registry which contains the 19,683 statement-of-claims that were filed under the 1974 Water Rights Registration Act. The Act sought to record historic rights to surface water which were established prior to the June 12, 1919 Public Water Code.

The Department received 16,309 applications for stockpond certificates which were submitted pursuant to the 1977 Stockpond Registration Act. These stockponds, used for livestock watering and wildlife, were constructed between June 12, 1919 and August 27, 1977, and had no prior permit or certificate. After many instances in which both the federal agency which owned the land and the stockpond user filed for a certificate, the Department issued a preliminary order that all stockponds would be registered in the name of the federal agency, except those constructed on Bureau of Land Management land with a range improvement permit. The Arizona Cattle Growers Association requested a rehearing, and the matter is still pending.

Adjudications

An adjudication of water rights is a court determination of the status of all rights to use water from a river system or watershed. Under Arizona law, one or more water users in a river system may petition the court for a general adjudication to determine the extent and priority of all appropriable water rights in the system. The adjudication is conducted in the superior court of the county in which the largest number of claimants reside.

The Department of Water Resources assists the court by notifying all property owners in the watershed, and tabulating, mapping, investigating and verifying the statement-of-claimant forms once they are submitted. The Department also investigates the water supplies and compares them to the amounts claimed. Once the DWR submits its report to the superior court, a special master is appointed to take testimony and submit his findings to a judge who has been appointed by the State Supreme Court.

The Arizona Public Water Code of 1919 authorized the State Land Department to hear and administer adjudications of water rights. When the State Legislature transferred this responsibility to the courts in 1979, petitions had already been filed requesting general adjudications of water rights for the San Pedro River, the Salt River above Granite Reef Dam, the Verde River, the Upper Gila River and the Little Colorado River. In March of 1980, the Pinal County Superior Court accepted a petition to include the remaining portion of the Gila River drainage system in the Upper Gila River adjudication. The addition of this area means the entire Gila River drainage system, from the New Mexico state line to the Colorado River, will be adjudicated. The exception is that portion of the Upper Santa Cruz River which is being adjudicated in Federal District Court in Tucson.

Senate Bill 1393, enacted in 1981, amended adjudication laws to allow water users of different watersheds to consolidate into a single adjudication proceeding where appropriate. As a result, petitioners of individual watersheds in the Gila River system have filed a motion requesting the Supreme

Court to consolidate all the petitioned areas into one Gila River Basin adjudication. The court is considering the petition.

In January, 1980, Federal District Court judges in Tucson and Phoenix issued separate decisions, which determined that Arizona rules of procedure regarding the adjudication of water rights are sufficiently comprehensive to determine federal and Indian water rights, including reserved rights and claims to groundwater. The decision by Phoenix District Court Judge Cordova was appealed to the 9th Circuit Court of Appeals by the four Indian tribes who initiated the lawsuit.

The deadline for filing statement of claimant forms in the Salt River and San Pedro River watersheds was June 30, 1980; approximately 8,000 claimants filed in these basins. Notices to all property owners in the Little Colorado River Basin will be sent by certified mail in August, 1981.

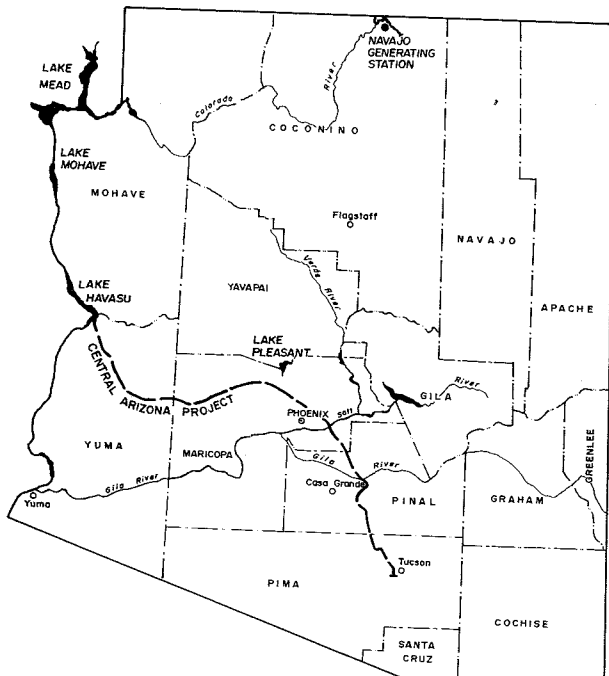


River Basins Petitioned for Adjudication

Statewide Water Planning

Central Arizona Project Allocation Studies

In October, 1980, the Department of Water Resources presented its revised CAP water allocations for municipal and industrial users to Interior Secretary Cecil Andrus. The recommended allocations are based on a 725,000 acre-feet supply of CAP water in the year 2034, which is the last year of project repayment. This proposal deviates from the 1977 allocation which divided 500,000 acre-feet of water among the applicants. The earlier allocation was based on the premise that contract amounts would be limited to the firm supply available from the Colorado River and would not be subject to shortages during drought periods. The 725,000 acre-feet allocation reflects the new assumption that M&I users will probably be subject to periodic shortages in the future. In calculating the allocations, the DWR assumed the Secretary of the Interior's final decision on the Indian allocation will permit exchanging effluent for Indian agricultural water.



The Central Arizona Project is scheduled to begin delivering Colorado River water to Phoenix in 1985 and to Tucson in 1989.

In December, 1980, Governor Babbitt and Wesley Steiner, on behalf of the State of Arizona, sued Interior Secretary Cecil Andrus to prevent him from contracting with twelve Arizona Indian tribes for Central Arizona Project water until the environmental impact statement was prepared. The State of Arizona also asked the court to require that Andrus recognize the priority of municipal and industrial water uses in the Colorado River Basin Project Act. The Federal District Court granted the State's request for a preliminary injunction until an EIS is prepared. The Department of Interior filed an appeal with the Ninth Circuit Court which is still pending.

On December 10, 1980, Secretary Andrus' allocation to the twelve Arizona Indian tribes was published in the *Federal Register*; it contained the following provisions:

1. Twelve Arizona Indian tribes will share an allocation of 309,828 acre-feet of CAP water.
2. Seven tribes, (Camp Verde, Tonto Apache, Yavapai Prescott, Pascua Yaqui, San Carlos, Shuk Toak and San Xavier) which did not receive allocations under Secretary of Interior Kleppe's 1976 allocation, will receive 52,810 acre-feet of the total Indian share of CAP water. The allocations are to help maintain the permanent tribal homelands, and to provide the minimum water resources needed for development and growth.
3. In times of shortage, Indian and M&I users have priority over other users.

Central Arizona Water Conservation District

The Department of Water Resources provides technical assistance to the Central Arizona Water Conservation District, the organization established to repay the federal government for costs of the project which benefit non-Indian users of CAP water. The Department billed the CAWCD \$24,505 for repayment and water-supply studies done this fiscal year.

The CAWCD will subcontract with the eventual users of CAP water. An ad valorem tax of .03 per \$100 of assessed value will be assessed all real

property owners in Maricopa, Pima and Pinal Counties to help repay project costs.

Tom Clark, formerly DWR's Deputy Director for Planning and Administration, was hired as General Manager of the CAWCD. He assumed his new duties on April 1, 1981.

Construction Status

According to figures compiled by the U.S. Bureau of Reclamation, the agency constructing the CAP, the Project is 35% complete. Total expenditures so far equal \$752 million, which includes \$214 million for the Navajo Generating Plant near St. Johns. The total costs projected through September of this year are slightly over two billion.

Office Of Water Conservation

The cornerstone of the 1980 Groundwater Act is conservation. The law calls for effective water conservation practices by all groundwater users — mines, farmers, industry and city dwellers. During the fiscal year, the Department of Water Resources established the Office of Water Conservation and hired two conservation specialists to provide technical expertise in developing specific conservation goals. Will LeGrande is the urban water conservationist, and Walter Parsons is the agricultural water conservation expert.

The goal of the urban conservation program is to gradually reduce the amount of groundwater withdrawn by all non-irrigation users. Over a 45-year period divided into five management plans, the DWR will establish increasingly stringent conservation requirements to meet the long-term goal of balancing the annual amount of water consumption with the renewable supply.

Part of the agricultural conservation program is establishing the per-acre amount of groundwater farmers will be able to use. In calculating the "irrigation water duty," the Department will consider the crops historically grown, soil conditions and conservation methods currently available which would be reasonable for the farmer to use.

Both men are highly qualified for their jobs. Will LeGrande has a master's degree in urban planning and spent two and one-half years as the wastewater flow reduction and water conservation coordinator for the Maricopa Association of Government's 208 Water Quality Management Program. Walter Parsons has 23 years' experience with the U.S. Soil Conservation Service in Arizona. For the past three years he specialized in farm irrigation

programs in southern and southeastern Arizona. He is on loan to the DWR through an intergovernmental agreement with the Soil Conservation Service.

The staff has begun working on a water conservation "state-of-the-art" document to be completed by mid-1982. This document will serve as a guide to the active management area directors in formulating their management plans.

Flood Control

Flood Control Assistance Program

The Department of Water Resources administers the Flood Control Assistance Program, which provides state funds to reimburse local sponsors 50 percent of their costs in acquiring rights-of-way and relocating utilities to accommodate the installation of an authorized federal flood control project.

Since the program's inception in 1973, funds have been appropriated as follows:

FY 1973-74	\$2,450,000
FY 1974-75	895,000
FY 1975-76	176,000
FY 1976-77	600,000
FY 1977-78	5,000,000
FY 1978-79	8,000,000
FY 1979-80	4,000,000
FY 1980-81	4,000,000
FY 1981-82	4,000,000
Total	<u>\$29,121,000</u>

From FY 1973 through FY 1981, the Department disbursed approximately \$25,000,000 to local sponsors. Projects completed with funds from this program include Sunset and Sunnycove Dams in Wickenburg, the Foote Wash Project in Graham County, the Spook Hill and Cave Buttes Dams in Maricopa County and the inlet, outlet and interceptor channels for the Indian Bend Wash Project in Scottsdale. Numerous other projects funded through this program are under construction or in the advanced stages of planning. Some of these are Adobe Dam, New River Dam, Arizona Canal Diversion Channel and the Roosevelt Water Conservation District floodway.

Disbursements for FY 1980-81 included \$4,524,000 to the Flood Control District of Maricopa County and \$437,000 to the City of Scottsdale.

Flood Control Planning Program

Through this technical assistance program, the DWR conducts and pays for economic and engineering studies requested by county flood control districts to investigate flood problems and seek the most cost effective solutions.

Since the program's inception in 1978, 33 requests have been received for planning assistance. The Department has completed eleven reconnaissance studies and three feasibility studies.* An additional seven reconnaissance studies are being evaluated at the reconnaissance level.

If a flood control project is found to be economically feasible, the county flood control district is eligible to receive 50 percent of the installation costs through the Alternative Assistance Program.

Alternative Assistance Program

The Alternative Assistance Program, established by the State Legislature in 1978, provides financial assistance to county and special flood control districts for the installation of flood control projects developed pursuant to A.R.S. Sec. 45-2309 and A.R.S. Sec. 45-2360(8). For a county flood district to qualify for up to 50 percent of the installation costs, the proposed flood control project must first be studied by the Arizona Department of Water Resources. Special flood control districts (i.e. Flood Control District of Maricopa County) may conduct their own studies after receiving advanced approval from the department. [A.R.S. Sec. 45-2360(8)]. This program was established to help communities solve flood problems that do not meet the criteria for federal flood control assistance.

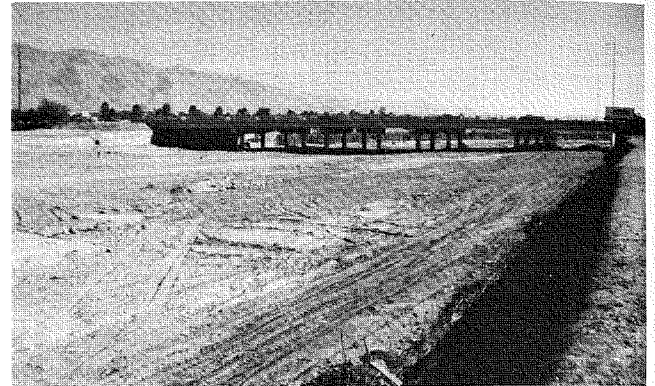
Since the program's inception, appropriations were made as follows:

FY 1978-79	\$3,000,000
FY 1979-80	3,000,000
FY 1980-81	-2,900,000*
FY 1981-82	2,647,000
Total	\$5,747,000

*Reallocated to Arizona Highway Department for bridge construction

*A reconnaissance study is a preliminary evaluation of several solutions to a flood control problem, which is based on minimum field data. A feasibility study is a detailed engineering and economic study of the recommended flood control plan that serves as preparatory work for the final design.

At the end of FY 1980-81, the Department had encumbered \$580,000 for the Rillito River Project in Tucson. Two million dollars has also been encumbered for a levee system along the Little Colorado River in Winslow, and \$236,000 was set aside for a small channelization project in Nogales. The Department is studying other projects for possible participation in the program.



The Rillito River Project, located in Tucson at the junction of Oracle Rd. and Rillito, channelizes a ¼ mile section of the river to protect local businesses and homes.

Flood Control Loan Program

Once a county or special flood control district qualifies for funding under the Alternative Assistance Program, the Flood Control Loan Program offers the district an optional financial plan that often expedites installation of an approved project.

The capital required to initiate construction of a flood control project often exceeds the balance of tax revenues available to a district during the construction period. In some cases, the total outlay of the district's portion of the project cost creates a cash flow problem. The loan program affords the districts the funds to proceed with project construction while providing a loan repayment schedule that won't jeopardize their cash flow.

Since the program was established in 1970, appropriations were made as follows:

FY 1979-80	\$5,000,000
FY 1980-81	-3,450,000*
FY 1981-82	354,000
Total	\$1,904,000

*Reallocated to Arizona Highway Department for bridge construction

In FY 1980-81, the Department disbursed \$290,075 to the Pima County Flood Control District for the Rillito River Project from Flowing

Wells to Oracle Road. The DWR expects to receive additional loan requests totalling \$1,200,000 during FY 1981-82 for five projects the Department is currently studying.

Special Flood Control Legislation

In response to the devastating floods of 1978, 1979 and 1980, the State Legislature appropriated funds for badly needed flood control projects. The following is a summary of projects which received funds through the Department of Water Resources:

1. *Salt/Gila River Clearing Projects*: House Bill 2457, 1979 — \$455,000 to Flood Control District of Maricopa County to conduct environmental assessments, clear vegetation from portions of Gila River, repair Gillespie Dam and clear silt and vegetation from its reservoir. Senate Bill 1163, FY 1980-81 — \$1,100,000 for engineering studies and channeling, clearing, stabilizing, diking reaches of Salt and Gila Rivers. The Flood Control District of Maricopa County has received \$210,000 of the original \$455,000.
2. *City of Phoenix Projects*: 1979—\$4,000,000 to City of Phoenix for half the cost of rechanneling Salt River by Sky Harbor International Airport. (City of Phoenix pays other half.) Senate Bill 1163, 1980 — \$1,000,000 supplement to construct channel or to offset portion of cost to construct bridge over Salt River at 24th Street. The City of Phoenix has received \$1,250,000 of these appropriations.
3. *Agua Fria River at Black Canyon City*: After the 1980 flood, the Soil Conservation Service provided funds, (Federal Emergency 403 Program), to channelize a part of the Agua Fria River near Black Canyon City. The Legislature appropriated \$120,000 to Yavapai County to meet their 20 percent funding requirement. The project was completed in early 1981. \$80,000 was returned to the state's general fund since construction costs were less than anticipated.
4. *City of Tucson Projects*: Senate Bill 1163, 1980 — \$2,400,000 to City of Tucson for half the cost of engineering, channelization and stabilization needed to mitigate potential damage of flooding along Santa Cruz River from 22nd Street to St. Mary's Road. (City of Tucson pays other half). The engineering study will be completed by September, 1981.

Statewide Flood Warning Office

The Flood Warning Office (FWO) is operated by the National Weather Service and the Arizona Department of Water Resources. A small staff monitors and interprets data collected from stream and precipitation gauges located around the state before feeding the information to federal, state and local agencies. During a flood, data is collected every fifteen minutes and transmitted via satellite to a ground station in Salt Lake City which relays the information to our FWO.

The State Legislature appropriated \$100,000 for FY 1980-81 to complete the installation of 47 streamgauges and 40 raingauges. The U.S. Geological Survey matches these funds and does the installation. At the close of the fiscal year, 27 streamgauges and 23 raingauges were operational.

The FWO assisted Maricopa and Pima Counties in planning and developing their radio telemetry systems. This system is designed to monitor flash floods, which usually have very short lead times and cannot be forecast by the satellite telemetric system. When implemented, the counties will be able to prepare initial flood forecasts and monitor and verify stream flows. Maricopa County has installed a computer and is installing the precipitation gauges. Pima County's flood warning program is still in the planning stage.

The FWO has greatly improved the warning preparedness of the state. For the first time, accurate flood warning information is available for local and state emergency coordinators to utilize.

Interstate Water Planning

Arizona vs. California

The Arizona vs. California lawsuit continues as five Lower Colorado River Indian tribes seek rights to Colorado River water beyond those granted to them in the 1964 Supreme Court decree. Claims are being asserted for reservation boundary adjustments and for lands claimed to have been omitted in the original decree. These additional claims total nearly 400,000 acre-feet of annual water diversions. About 210,000 acre-feet of this amount would be used in Arizona. The consumptive use, or actual water depletion, is estimated to be about 132,000 acre-feet.

The U.S. Supreme Court appointed Special Master Elbert B. Tuttle to hear the case. The trial began September 2, 1980 and concluded in April, 1981. Much of the testimony centered on whether

the land claimed by the tribes is practicably irrigable. The Indians want to raise figs, nuts and grapes. Judge Tuttle is expected to issue a preliminary report this fall.

Colorado River Basin Salinity Control Forum

The Colorado River Basin Salinity Control Forum was established in 1973 by water resource and water quality representatives of each of the seven Colorado River Basin states. The Forum works with the Environmental Protection Agency in developing the salinity standards for the Colorado River required by the Federal Water Pollution Control Act.

In a recent report on saline water prepared by the Bureau of Reclamation, Commissioner Robert Broadbent stated that without a salinity control program, damages to agricultural, municipal and industrial users in the lower Colorado Basin states could be as much as \$250 million annually.

In November, 1980, the Forum hired its first Executive Director, Jack Barnett. He will coordinate and promote salinity control activities with the objective of maintaining water quality standards for salinity.

The Department of Water Resources is an active member of the Forum and its permanent work group. During the year, the group completely reviewed the existing salinity standards and a plan

for implementing salinity control in the Colorado River system above Imperial Dam. This review, required by the Clean Water Act of 1977, is the second review since standards were first developed in 1975. Department staff provided considerable assistance and reviewed reports prepared by the Bureau of Reclamation and Soil Conservation Service for individual salinity control projects. The report recommended no changes in numeric salinity at the three lower mainstream locations.

These standards are based on maintaining salinity in the Lower Colorado River at or below 1972 levels while the basin states continue to develop their compact-apportioned waters. The salinity standards for the three locations are as follows:

	Salinity in mg/l
below Hoover Dam	723
below Parker Dam	747
at Imperial Dam	879

In 1977, the Environmental Defense Fund filed suit against the Environmental Protection Agency on the grounds that EPA's standards for salinity control were not rigorous enough. The seven basin states intervened on behalf of EPA, and in October, 1979, the Federal District Court for the District of Columbia dismissed all six claims brought by EDF. EDF later appealed the case, but the District Court's decision was upheld by the Appeals Court in April, 1981.

Hydrology and Engineering

Adequacy of Water Supply For Subdivisions Outside Active Management Areas

The Department of Water Resources reviews the adequacy of subdivision water supply outside groundwater active management areas. The 1980 Groundwater Management Act requires the developer of a subdivision located outside an active management area to submit plans for the development's water supply to the DWR prior to recording the plat. The developer attempts to demonstrate that the water supply is adequate to meet development's projected needs.

After reviewing the plans, the DWR issues a report on the adequacy of the development's water

supply. If the supply is inadequate, or if no water is available, the State Real Estate Commissioner requires the developer to include a summary of the Department's report in all promotional material and contracts. [A.R.S. Sec. 32-2181(F)]

Assured Water Supply For Developments Inside Active Management Areas

The Groundwater Act states that if a new development is located inside an active management area, but outside the service area of a city or private water company, the developer must prove he has a 100-year supply of adequate quality water before he can record the plat or obtain the Real

Estate Commissioner's public report. The law also requires the DWR to publish notice of the application for a "Certificate of Assured Supply" and allow a ten-day public comment period for local residents.

The DWR designates service areas in which there is an adequate or assured water supply. A developer need not submit water supply plans to the Department if his development is within a service area that has this designation. [A.R.S. Sec. 45-108 & 45-576]

The following is a list of service areas designated as having an adequate water supply. Within the active management areas the term is "assured" supply; outside those areas it is referred to as "adequate" supply.

SERVICE AREAS DESIGNATED AS HAVING ASSURED OR ADEQUATE WATER SUPPLY

Municipalities	
COUNTY	CITY
Apache	Springerville, St. Johns
Cochise	Douglas, Willcox
Coconino	Flagstaff, Page
Gila	Globe
Graham	Safford
Greenlee	none
Maricopa	Avondale, Buckeye, Chandler, El Mirage, Glendale, Gilbert, Goodyear, Mesa, Peoria, Phoenix, Scottsdale, Tempe, Wickenburg, Youngtown
Mohave	Kingman, Lake Havasu City
Navajo	Holbrook, Winslow
Pima	Tucson
Pinal	Florence, Eloy
Santa Cruz	Nogales
Yavapai	Prescott
Yuma	Parker, Yuma
Water Companies	
COUNTY	COMPANY
Maricopa	Consolidated Water Utilities, Inc. Desert Sands Water Co. Litchfield Park Service Co. Pima Utilities Co. Rio Vista Water Co. Sun City Water Co. Turner Ranches Water & Sanitation Co. White Tanks Water Co. Sun City West Utilities Co.
Navajo	Arizona Water Company (Lakeside and Pinetop)
Pinal	Arizona Water Company (Casa Grande, Coolidge, Florence)

The DWR staff works closely with developers to help them understand the adequate or assured water supply requirements. We strongly urge developers to contact the Department as early as possible in their development plans. Chief Hydrologist Edward A. Nemecek supervises the program.

When the new groundwater law was passed, many developers were caught short by the assured water supply provision. In order not to penalize those who, in good faith, made substantial investments while unaware of the law, the State Legislature, in April, 1981, passed an amendment to exempt developers from the assured supply requirement if they met three criteria. They had to demonstrate they invested substantial capital before June 12, 1980, beyond the cost of acquiring the property. They also had to show they were ignorant of the groundwater law at the time they made the investment. And finally, they had to demonstrate that the project complied in all other respects with the law existing prior to the new Act.

The Legislature gave the DWR until June 30, 1981 to consider any applications for this exemption. Nineteen developers sought the exemption; nine were granted the exemption and six were denied. Those six sought hearings before the Department which are still pending.

Private water companies which did not have a Central Arizona Project allocation also found it difficult to meet the assured supply requirement. Since CAP allocations have not yet been finalized, these companies were unable to prove the assured supply for some of their service areas. The Legislature, therefore, amended the groundwater law to allow the DWR director to grant a private water company the "conditional presumption of an assured water supply" if the company made an unconditional offer to contract for CAP water and could finance and construct the necessary delivery system. As of June 30th, no one has applied for this designation.

Regulations For Well Construction And Well Drillers

The Groundwater Management Act requires the Department of Water Resources to license all well drillers and adopt well construction standards. [A.R.S. Sec. 45-594, 595]

The Department has written temporary well construction regulations which are primarily concerned with protecting groundwater from contamination. The regulations were drafted by a

committee representing the water well industry, municipalities, irrigation districts and technical consulting fields. The DWR also welcomes comments on these temporary regulations from any interested person. Temporary well drilling licenses are issued to any drilling firm that files an application and demonstrates its qualifications.

The groundwater law also requires the installation of approved measuring devices on all non-exempt wells located in the active management areas and irrigation non-expansion areas. An exempt well is one with a pump capacity of 35 gallons per minute or less used for any purpose, including the non-commercial irrigation of not more than one acre of land. A non-exempt well has a pump capacity exceeding 35 gallons per minute. The Department has not yet adopted standards for approved measuring devices. Therefore, anyone who wishes to construct or install a well measuring device should submit plans to the Director for approval. Questions regarding these regulations may be directed to Edward Nemecek: 255-1586.

The Act calls for the statewide registration of all wells — exempt and non-exempt — by June 14, 1982. The filing fee is \$10 for non-exempt wells; there is no charge for exempt wells. Registration forms and information are available at the Department and the Tucson, Prescott and Pinal Active Management Area offices.

Water Quality Planning

The Department of Water Resources has participated in water quality planning since 1967 when the State Legislature created the Arizona Water Quality Control Council to formulate water quality standards in accordance with the National Water Quality Act of 1965. Philip C. Briggs, Deputy Director of Engineering, is a member of the Council.

In 1973, the Governor made the Council the official agency responsible for developing Arizona's water quality management plans in compliance with the Federal Water Pollution Control Act as amended in 1972.

Water quality management planning studies which began in 1973 under Section 208 of Public Law 92-500 were completed last fiscal year by six local councils of government.

Currently, the Department of Health Services and three local government councils are conducting studies to develop a Groundwater Pollution Management Program, which will be submitted to the Water Quality Control Council for adoption. The

DWR is participating in these studies to provide technical assistance, and to assure the program's compatibility with the active management area management plans.

Watershed Management Program

The Groundwater Management Act directs the Department of Water Resources to develop ways of augmenting water supplies in active management areas. Watershed management, a proven means of increasing watershed runoff, has been studied in Arizona for many years. The current program outlines data needs, encourages the federal government to conduct research in Arizona and supports such research once it is undertaken.

A citizen's advisory group, the Arizona Water Resources Committee, advises the DWR and federal agencies on watershed management and helps publicize the results of their research. Such diverse industries and groups as ranching, mining, agriculture, forestry, utilities, banking, water user groups and environmentalists are represented on the Committee. The Committee and the Water Resources Department annually cosponsor a watershed symposium which is open to the public. The proceedings are published and are available from the Department upon request.

Cooperative Investigation Of Water Resources

The Department of Water Resources funds half of the U.S. Geological Survey's (USGS) annual water resources investigations in Arizona.

Part of the funds is used for the USGS stream-gage program which monitors the quantity and quality of our surface-water resources. The state pays half the cost of operating 65 of the more than 100 stream-gage stations around Arizona. The USGS gathers streamflow and water-quality data from these stations for annual publication in their report series, *Water Resources Data for Arizona*.

The USGS/DWR cooperative groundwater program has two elements: (1) the statewide collection and analysis of basic groundwater data and comprehensive investigation of selected groundwater basins; (2) research of specific hydrologic problems. The DWR publishes the groundwater data gathered in this program. *Annual Report on Groundwater in Arizona* and *Water Resources in the Sedona Area* are two examples of reports

prepared by the USGS and published by either agency under this program.

The Department also publishes a hydrologic map series of information collected in basic data studies. Over 40 map sets have been published; one of the most recent is entitled *Maps Showing Groundwater Conditions in the Harquahala Plains Area, Maricopa and Yuma Counties, Arizona - 1980*. Department hydrologists are currently investigating the following groundwater basins for the map series: Little Chino, Waterman Wash, Avra and Altar Valleys, McMullen Valley and the Upper Santa Cruz area.

Division of Safety of Dams

The Department of Water Resources monitors the safety of all non-federal dams which are higher than 25 feet or have a water storage capacity exceeding 50 acre-feet.

The Department's engineers review plans and specifications for dams being newly constructed or repaired. They analyze and check the adequacy of the spillway, foundation, materials, seismicity and structural stability of the dam. They must grant approval in writing before the owner may build a new dam or modify an existing one. The engineers make inspections during construction to insure compliance with the approved plans and specifications and to identify conditions which may require design changes.

Before constructing or modifying a dam, the owner must file an application with the Department. There is a \$50 filing fee, and an application fee which is based on a percentage of the total project cost. This fiscal year the Department received \$47,535 from seven applicants. The money is returned to the state general fund.

This year the staff reviewed three applications for construction of new dams and four for repair of existing dams. Twelve dams were under construction during the report period. Of these, six were being newly constructed and six were being repaired.

Our engineers periodically inspect all operating dams to detect any weaknesses or maintenance problems before they become serious. Each year the Department visits about two-thirds of the 173 dams under its jurisdiction. One hundred fifty-one of these dams are made of earth or earth and rock, 22 are concrete or masonry and one is steel. Fifty-eight of the dams have storage capacities exceeding 1,000 acre-feet.

This year, due to an exceptionally heavy workload, only 70 operational dams were inspected. Three projects in particular occupied much of the staff's time: the breaching of Golder Dam, the modification to Lake Patagonia Dam and the investigation of the failure of Clear Creek Dam #2.

The breaching of Golder Dam, located about twenty miles north of Tucson, was completed in July. The cost was \$370,000, which came from a special legislative appropriation made in 1979. The Department of Water Resources placed a lien on property to recover the cost of breaching the dam and return the money to the general fund.

In 1979 the Legislature appropriated \$1.6 million to increase the spillway capacity and the outlet works of Lake Patagonia Dam. Woodward-Clyde Consultants designed the improvements and supervised construction by Granite Construction Company of Tucson. The spillway was widened from 140 to 400 feet, the dam was raised eight feet, a new, larger valve was installed in the outlet works and instrumentation was installed to monitor the dam's performance. Construction was completed in June at a cost of \$1,624,490.

On June 11, 1981, Clear Creek Dam #2 failed during the completion of the final section of the embankment. This small earthfill dam near Winslow was being built to enlarge the reservoir behind Clear Creek Dam.

The Department's investigation found the failure was caused by progressive internal erosion of the dam embankment in the right abutment area; the structure was not able to withstand the action of the water. The report concluded the main problem was the inability of the underdrain system to control the flow of artesian springs, which forced the groundwater to find another exit. The report was mailed to the owner in October, and he submitted revised construction plans and specifications which the Department is still reviewing. In addition, the owner, contractor and engineer are discussing plans to share the cost of completing construction.

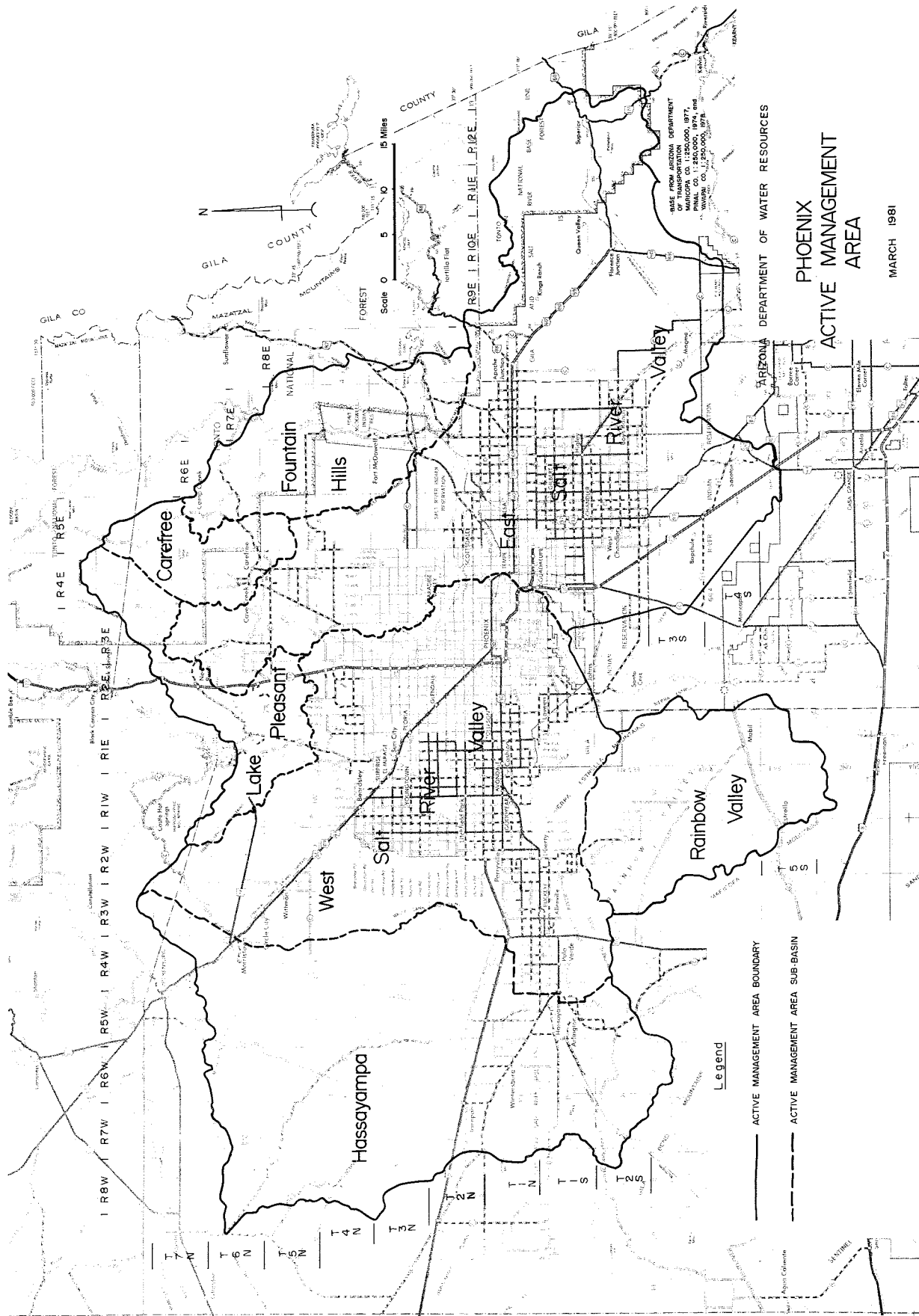
The National Dam Safety Inspection Program was implemented in 1977 in response to several severe dam failures around the country. The U.S. Army Corps of Engineers contracted with the Department of Water Resources to prepare Phase I Reports on 62 dams under Arizona jurisdiction.

This year the Department completed 24 reports to finish the Phase I study. Twenty-nine dams were designated "non-emergency unsafe." In most cases this designation means the existing spillway is incapable of safely passing a flood outlined in the

Corps of Engineers guidelines. The "non-emergency" designation indicates there is no imminent danger to the structure. Nevertheless, the owner is expected to examine the dam and take the appropriate remedial action. By the end of the year, four of the unsafe dams were repaired.

The Dam Safety Coordinating Committee was

established this year to improve communication among the three agencies that have jurisdiction over dams in Arizona: The Salt River Project, the Bureau of Reclamation and the Department of Water Resources. Meetings were held regularly to discuss effects of the Corps' new "spillway design flood" on Salt River Project dams.

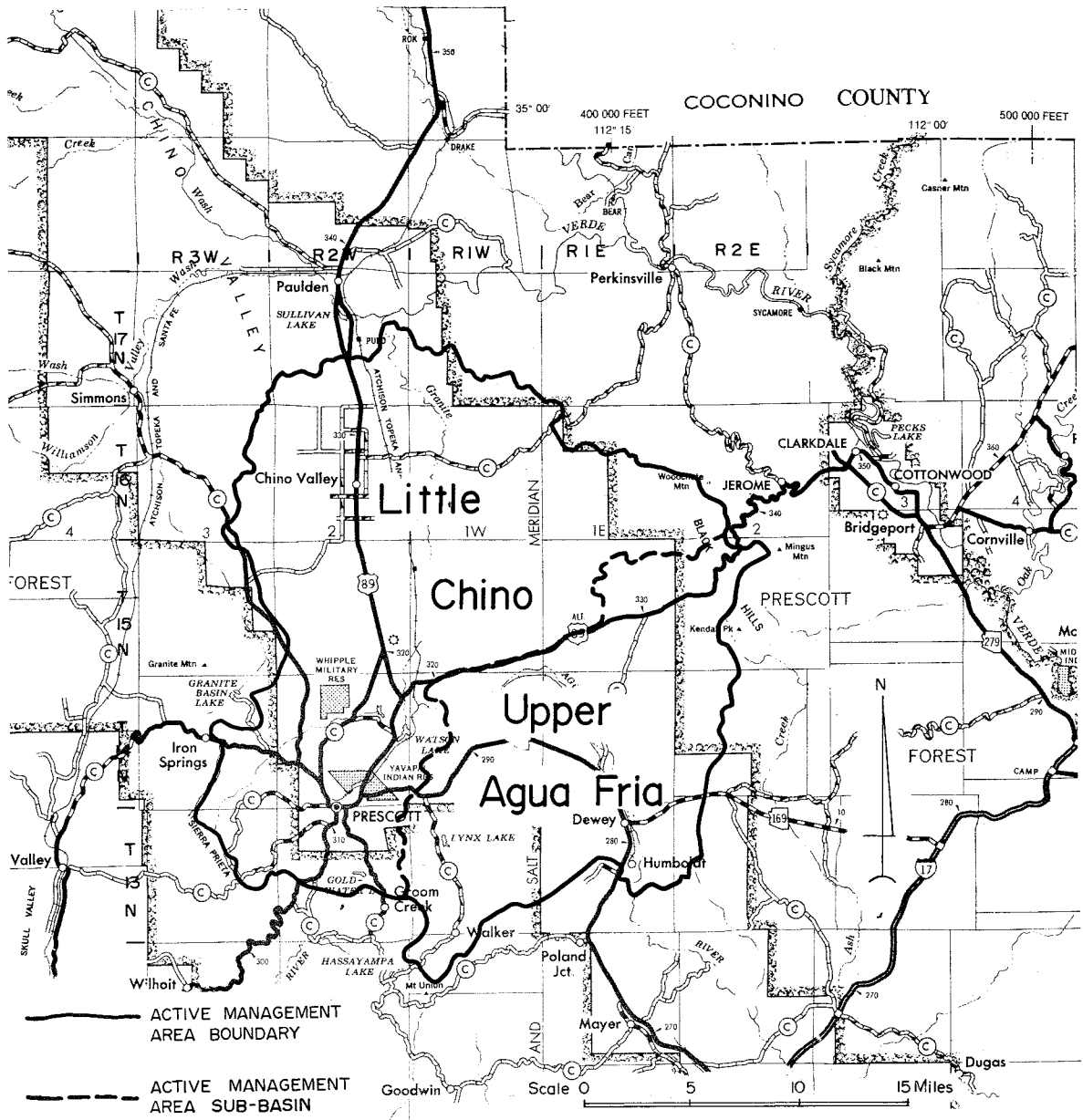


ARIZONA DEPARTMENT OF WATER RESOURCES
PHOENIX ACTIVE MANAGEMENT AREA

MARCH 1981

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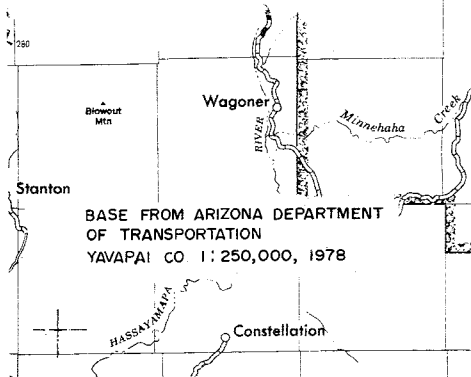
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- - - ACTIVE MANAGEMENT AREA SUB-BASIN

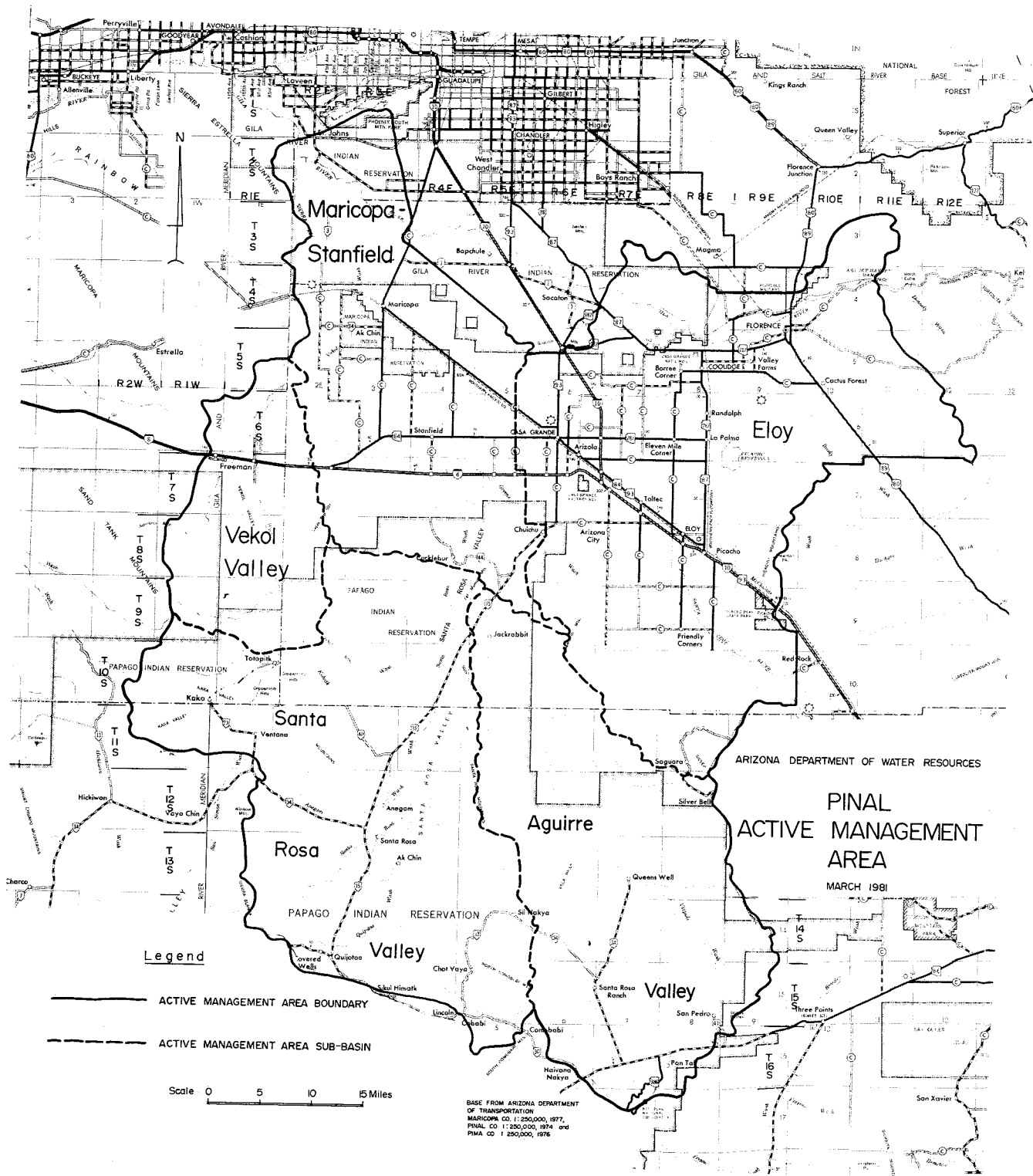


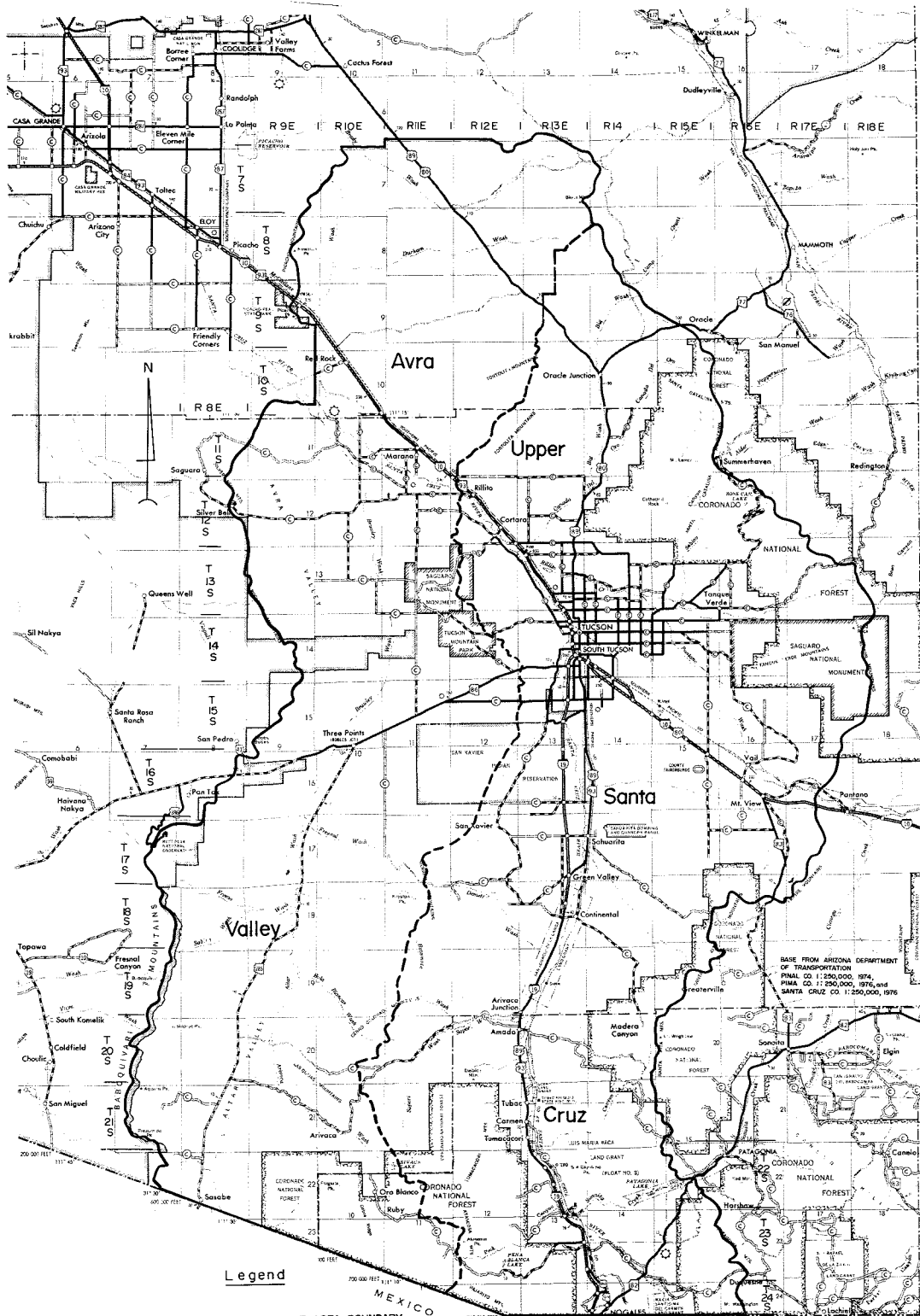
ARIZONA DEPARTMENT OF WATER RESOURCES

PRESCOTT ACTIVE MANAGEMENT AREA

MARCH 1981



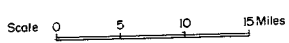




BASE FROM ARIZONA DEPARTMENT OF TRANSPORTATION
 PINAL CO. 1:250,000, 1974,
 PIMA CO. 1:250,000, 1976, and
 SANTA CRUZ CO. 1:250,000, 1976

Legend

- ACTIVE MANAGEMENT AREA BOUNDARY
- - - ACTIVE MANAGEMENT AREA SUB-BASIN



ARIZONA DEPARTMENT OF WATER RESOURCES

**TUCSON
 ACTIVE MANAGEMENT
 AREA**

MARCH 1981