

# APPENDIX D

## APPENDIX D Colorado River Management

The “Law of the River” as described briefly below, is a collection of federal and state laws, interstate compacts, Supreme Court decisions and international treaties that govern the operation and use of the Colorado River. In the Lower Colorado River Basin, the United States Secretary of the Interior (Secretary) is the Watermaster. Acting through the Bureau of Reclamation, the Secretary operates Colorado River dams and accounts for water use on an annual basis. Pursuant to Section V of the Boulder Canyon Project Act, the Secretary contracts with water users in the Lower Basin for water up to the total amount of each state’s apportionment.

### Colorado River Compact – 1922

In 1921, the seven Colorado River Basin states authorized the appointment of commissioners to negotiate a compact for the apportionment of the water supply of the Colorado River. Although the states were unable to negotiate an allocation of water for each state, an agreement was signed in November 1922, the Colorado River Compact (Compact) that divided the Colorado River Basin into the Upper Basin and the Lower Basin.

The Compact apportioned to the Upper Basin (Colorado, New Mexico, Utah, and a portion of Arizona) and to the Lower Basin (Arizona, California, and Nevada) the exclusive beneficial consumptive use of 7.5 million acre-feet of water to each basin annually. Because the Colorado River Basin includes a portion of Mexico, the Compact recognized Mexico’s right to use River water. Water for this purpose was to be met from surplus water supplies in excess of the amounts apportioned to the Upper and Lower Basins. Any burden that might arise because of a water treaty with Mexico was to be shared equally by the two basins. The Compact recognized that the ability of the Upper Basin to meet the requirement to deliver 7.5 million acre-feet to the Lower Basin could be impacted by climatic factors, therefore the Compact only required the Upper Basin to restrict its use so that delivery to the Lower Basin would not be depleted below an aggregate of 75,000,000 acre-feet for any period of ten consecutive years.

### Boulder Canyon Project Act - 1928

The Boulder Canyon Project Act (Project Act) authorized construction of the Hoover Dam and Power Plant and the All-American Canal. It also authorized Arizona, California and Nevada to enter into an agreement whereby the 7.5 million acre-feet of water apportioned to the Lower Basin by the Colorado River Compact would be apportioned as follows: to California, 4.4 million acre-feet per year; to Arizona, 2.8 million acre-feet per year; and to Nevada, 0.3 million acre-feet per year.

### Treaty between the U.S. and Mexico – 1944

The water treaty between the United States and Mexico involving waters of the Colorado River (and the Rio Grande and Tijuana Rivers) was signed in 1944 and became effective November 8, 1945. The Treaty allocated to Mexico 1.5 million acre-feet of Colorado River system waters annually. The Treaty also provided an additional 200,000 acre-feet in years of supply surplus. In years of extraordinary drought, Mexico’s entitlement is to be reduced in the same proportion as consumptive uses in the U.S. are reduced.

Minute 242 was adopted and executed in 1973 in response to Mexico's concerns regarding the quality of Colorado River water being delivered to the Mexicali Valley. Minute 242 obligates the United States to implement measures that will maintain the salinity of the Colorado River waters delivered to Mexico at nearly the same quality as that diverted at Imperial Dam for use within the United States. The Colorado River Basin Salinity Control Act was signed into law on June 24, 1974, providing for the physical works necessary to implement Minute 242 without permanent loss of water to the Colorado River Basin states.

#### Upper Colorado River Basin Compact - 1948

This Compact divided the water apportioned to the Upper Basin by the Colorado River Compact between the five states with territory in the Upper Basin. Arizona was allocated 50,000 acre-feet per year with the remainder of the Upper Basin entitlement divided according to the following percentages: Colorado, 51.75; New Mexico, 11.25; Utah, 23.00; and Wyoming, 14.00.

#### Arizona v. California - 1964, U.S. Supreme Court Decree (Consolidated 2006)

On August 13, 1952, the State of Arizona filed a complaint with the U.S. Supreme Court against California and seven agencies within that state to resolve the contention by California that the Central Arizona Project should not be authorized. At California's insistence, the U.S. Congress would not authorize the Central Arizona Project until Arizona's right to the necessary Colorado River entitlement was clarified.

The Decree, handed down in 1964, confirmed that Congress had already apportioned, through the Boulder Canyon Project Act, the entitlement of water to the three Lower Basin states as follows: Arizona, 2.8 million acre-feet; California, 4.4 million acre-feet; and Nevada, 300,000 acre-feet. Any surplus above 7.5 million acre-feet was apportioned 50 percent to California and 50 percent to Arizona, except that Nevada was given the right to contract for 4 percent of the excess, which would come out of Arizona's share. The Decree also confirmed each of the Lower Basin state's entitlements to the flow of the tributaries within their boundaries, supporting Arizona's utilization of water from its in-state rivers, separate from its entitlement to its full 2.8 million acre-feet of Colorado River water.

The Decree left shortage allocation to the discretion of the Secretary after providing for satisfaction of present perfected rights in the order of their priority dates. These rights were defined as rights existing and used prior to the effective date of the Boulder Canyon Project Act. The allocation of shortages was later determined by Congress in the Colorado River Basin Project Act (1968).

#### Colorado River Basin Project Act - 1968

The Colorado River Basin Project Act on September 30, 1968 authorized construction of the Central Arizona Project and other water development projects in the Upper Basin. A significant concession was a provision that allowed existing California, Arizona, and Nevada Colorado River contractors to receive a priority over the Central Arizona project in times when the useable supply from the River was inadequate to provide 7.5 million acre-feet to the Lower Basin states, with California's priority limited to its 4.4 million acre-foot entitlement.

The Act directed the Secretary to propose criteria for the “coordinated long-range operation of the reservoirs” in the Upper Basin with the operation of the reservoirs in the Lower Basin. To accomplish this, the Act required the development of an Annual Operating Plan, in consultation with representatives of the seven Basin states.

## **Current Colorado River Issues**

### Shortage Criteria

In December 2007, the Secretary of the Interior signed the Record of Decision (ROD) on interim operating criteria (2008-2026) including the coordinated operation of Lakes Powell and Mead and criteria for implementing shortage reductions in the Lower Basin. At this time Lake Powell and Lake Mead are operated independently; annual Lake Powell water releases are determined based on applicable law and relevant factors contained in the Long-Range Operating Criteria. Proposed coordinated operation of the reservoirs would address two goals: avoid Lower Basin shortages and avoid curtailment of Upper Basin water use. If regional drought conditions continue shortage operations could begin as early as 2011.

In May 2005, Arizona water users asked ADWR to convene a stakeholder technical workgroup to develop a recommendation regarding appropriate Lower Basin shortage criteria and a strategy for apportioning shortage reductions between the Central Arizona Project (CAP) and equivalent priority mainstream Colorado River water users. In October, 2006 the Workgroup forwarded their recommendation to the Director, and with minor modifications it has been incorporated into the Reclamation Environmental Impact Study as part of the Basin States Alternative.

The modified shortage recommendation implements shortage reductions when Lake Mead water storage is depleted to key elevation triggers: In years when Lake Mead content is projected on January 1 to be at or below elevation 1075 ft and at or above 1050 ft, Arizona’s share of shortage reductions would be 320,000 acre-feet, below 1050 ft and at or above 1025 ft, 400,000 acre-feet and below 1025 feet elevation, 480,000 acre-feet. Reclamation will reconult with the states if conditions continue to worsen necessitating additional water supply reductions. The available shortage water supply would be apportioned within Arizona between the fourth priority mainstream water users and the CAP by first determining the mainstream available supply, based upon entitlement.

(Total fourth priority mainstream diversion entitlement = total fourth priority water supply before shortage reduction) X (total fourth priority water supply – shortage reduction volume)

The remaining fourth priority water supply after deducting the mainstream supply would be available for diversion by the CAP.

### Entitlement Transfers

Arizona communities along the Colorado River have experienced explosive growth over the last decade. These Arizona communities are unique because groundwater is not readily available as a supplementary water supply to meet this growing demand. Regardless of whether Colorado River

water is diverted from the mainstream or pumped from wells that are hydraulically connected to the river, the water is legally Colorado River water, and annual use is limited to a defined, maximum amount.

The Boulder Canyon Project Act requires U.S. Colorado River water users in the Lower Basin to have a contract for such water with the Secretary of the Interior. The Regional Director of Reclamation contracts with Lower Basin water users on behalf of the Secretary. The Supreme Court Decree in *Arizona v. California* requires Reclamation to account annually for all diversions and use of Colorado River water against the total Arizona allocation of 2.8 million acre-feet.

To meet this growing domestic demand, some Colorado River communities have acquired, transferred and changed the type of use of existing agricultural water entitlements. For non-federal Arizona contractors of mainstream Colorado River entitlements, these transfer actions are subject to review by the ADWR and consultation with ADWR and Reclamation. The Department has developed a substantive policy statement titled *Policy and Procedures for Transferring an Entitlement of Colorado River Water* that provides information regarding the Department's review of a proposed transfer action. This policy is available on the Department's website at [www.azwater.gov](http://www.azwater.gov). To date, using its substantive policy statement, the Department has made three assignment and two conveyance recommendations involving agricultural water entitlements. The Department is currently experiencing increasing contact from entities that are interested in the acquisition and conversion of agricultural entitlements to municipal and industrial uses and it expects to process additional contract transfer requests in the future.

A separate substantive policy statement governs the transfer of CAP subcontract entitlements within the three county CAP service area. The Revised Policy Regarding Transfer of Central Arizona Project Municipal and Industrial Water Subcontract Entitlements describes the criteria the Department evaluates and the priority of proposed transfer actions. This policy is also available on the Department's website at [www.azwater.gov](http://www.azwater.gov). Growth in the CAP service area has resulted in increased use of existing CAP subcontract water, and the Department expects few future transfer action proposals.

#### Lower Colorado River Planning Area Entitlement Transfer Actions

The following are a list of assignment and conveyances that have been conducted in accordance with the Department's Colorado River transfer policy that affects entities in the Lower Colorado River Planning Area. All involve a series of assignments and conveyances that began with the initial partial assignment of Cibola Valley Irrigation and Drainage District's entitlement in 2004. Since that time, two assignment and seven conveyance actions have been completed in the planning area. See Appendix B for a complete list of Colorado River entitlements within the planning area.

1. Through several assignment actions, Cibola Valley Irrigation and Drainage District (CVIDD) has reduced its entitlement from 24,120 acre-feet of 4th priority, 3,000 acre-feet of 5th priority and 4,000 acre-feet of 6th priority to its current entitlement of 9,366 acre-feet of 4th priority, 1,500 acre-feet of 5th priority and 2,000 acre-feet of 6th priority. In December 2004, CVIDD assigned 5,997 acre-feet of 4th priority each to The Hopi Tribe and to Mohave County Water Authority (MCWA). Both entities also acquired 750 acre-feet of 5th priority and 1,000 acre-feet of 6th priority

entitlement. In 2006, CVIDD assigned 60 acre-feet of 4th priority entitlement to Cibola Resources and in 2008 assigned another 2,700 acre-feet of 4th priority to Arizona Recreational Facilities, Inc. CVIDD's 4th priority entitlement includes 300 acre-feet for domestic water uses.

2. In December 2004, the Mohave County Water Authority (MCWA) was assigned 5,997 acre-feet of 4th priority, 750 acre-feet of 5th priority and 1,000 acre-feet of 6th priority irrigation entitlement from CVIDD. On July 6, 2007, MCWA conveyed its 4th priority entitlement for M&I use in its Mohave County contract service area, but retained its ability to use the entitlement for irrigation use on its Cibola Valley farmland until it was needed for use in Mohave County. On September 25, 2007 the MCWA conveyed 1,419 acre-feet of 4th priority, 750 acre-feet of fifth priority and 1,000 acre-feet of sixth priority entitlement to the Arizona Game and Fish Commission (AGFC) to use for Multi-Species Conservation Program (MSCP) purposes on the associated Cibola Valley land that it acquired simultaneously from MCWA. In June 2008, MCWA conveyed a total of 300 acre-feet of 4th priority entitlement. The first 50 acre-feet were conveyed to Springs del Sol Water Improvement District, while 250 acre-feet were conveyed to La Paz County.

3. In December 2004, The Hopi Tribe was assigned 5,997 acre-feet of 4th priority, 750 acre-feet of 5th priority and 1,000 acre-feet of 6th priority irrigation entitlement from CVIDD. On October 9, 2008, The Hopi Tribe conveyed 1,419 acre-feet of its 5,997 acre-feet 4th priority entitlement to the AGFC. In June 2008, it conveyed 50 acre-feet to Springs del Sol Water Improvement District, while 250 acre-feet were conveyed to La Paz County.

4. On October 25, 2006, 60 acre-feet of 4th priority entitlement was conveyed to B&F Investment LLC from Cibola Resources, Inc. Cibola Resources had initially acquired the 60 acre-feet from CVIDD and immediately transferred the entitlement to B&F for domestic use in the Ehrenberg area.

Note:

Assignments: Entitlement is assigned to a new entity, the type and place of use remain the same.

Conveyances: Entitlement may or may not be transferred to a new entity, but the place of use and/or the type of use is changed.

#### Inadvertent Overrun and Payback Policy

In October 2003, the Secretary of the Interior signed the Record of Decision to implement the Colorado River Water Delivery Agreement (WDA). The WDA includes the Inadvertent Overrun and Payback Policy (IOPP) to identify inadvertent overruns and to establish procedures to account for overruns and define subsequent payback requirements for Colorado River water users in the Lower Basin.

Inadvertent overruns occur when Colorado River water is diverted, pumped or received by an entitlement holder in excess of the water user's entitlement for that year. The IOPP creates a process and criteria to structure payback of the amount of water received in excess of the entitlement for that year.

### Federal Rulemaking to Establish the Accounting Surface

In August 2006, Reclamation initiated a rulemaking process to regulate the non-contract use of Colorado River water in the Lower Basin. The Boulder Canyon Project Act requires U.S. Colorado River water users in the Lower Basin to have a contract for such water with the Secretary of the Interior. The Regional Director of Reclamation contracts with Lower Basin water users on behalf of the Secretary. The Supreme Court Decree in *Arizona v. California* requires Reclamation to account annually for all diversions and use of Colorado River water against the total Arizona allocation of 2.8 million acre-feet.

The rulemaking is intended to ensure that all Colorado River water use is covered by an entitlement and correctly accounted for within the state's apportionment. Reclamation has contracted with the U.S. Geological Survey, to document non-contract water uses in the Lower Basin. The rule will establish the methodology that Reclamation will use to determine if a well is pumping Colorado River water and will also establish an appeal process. At this time, approximately 11,500 acre-feet of unallocated fourth-priority Colorado River water is available for allocation. Some of this water will be allocated to existing uses, after currently uncontracted uses have been quantified. The inventory is expected to provide comprehensive information about existing water uses that need an entitlement. The Department will use this information to allocate the remaining supply for domestic purposes.

### Yuma Desalination Plant

One unintended consequence of utilizing Colorado River water for domestic and agricultural purposes has been the steady increase in the salinity of its waters. The salinity problem created international discord in the 1960's when crops in the Mexicali Valley were damaged by the high salinity of the Colorado River water used for irrigation. An amendment to the 1944 treaty with Mexico guaranteed that the treaty water delivery would be no more than 115 ppm (+/- 30 ppm) more saline than the water diverted at Imperial Dam.

To comply with this requirement, the U.S. implemented a number of measures including re-routing drainage water from the Wellton-Mohawk Irrigation and Drainage District (WMIDD), to the Cienega de Santa Clara in Mexico. The U.S. also built a \$250 million desalinization plant in Yuma to treat WMIDD drainage water, before returning it to the mainstream. The Yuma Desalinization Plant (YDP) was completed in 1992, operated briefly in 1993 and then put on standby status until a recent "demonstration run" in 2007.

Wellton-Mohawk drainage water that is bypassed each year to the Cienega, is not counted against the total amount of Colorado River water that must be delivered to Mexico under the terms of the Treaty. In dry years, this results in Lake Mead storage decreasing by approximately 100,000 acre-feet annually since the bypassed water must be "made-up" from storage in Lake Mead. Recently, the decrease in Lake Mead storage after more than a decade of drought has increased the risk of shortage to Arizona Colorado River water users.

Operation of the YDP and the subsequent discharge of treated water to the Colorado River to meet U.S. Treaty obligations with Mexico would significantly reduce water flow to the Cienega. In 2004, the Yuma Desalination Plant/Cienega de Santa Clara Workgroup was formed to identify

and develop potential strategies to maintain the Cienega while making the treated irrigation return flows available for delivery as part of Mexico's allocation. Workgroup recommendations, which were released in April, 2005, identify a combination of various methods for bypass recovery or replacement that could meet these objectives.

In 2007, Reclamation conducted a demonstration run of the YDP by operating it at about ten percent capacity for three months. The purposes of the run were to test new equipment, acquire current operational data, and identify design deficiencies to better determine whether the facility could reliably and efficiently be operated on a long-term basis. Although the study results were favorable, it was determined that to obtain more conclusive information, the plant needed to be operated at a scale and for a duration which covers seasonal variations associated with chemical use and power consumption. As a result, Reclamation plans to conduct a second pilot run of the facility. During this pilot run, which is scheduled to be initiated in May 2010, the plant will operate at up to one-third capacity for 365 operating days during a 12- to 18-month period.

During this demonstration run, flows bypassed to the Cienega will be reduced by up to 29,000 acre-feet, while salinity levels will increase by about 540 parts per million. Reclamation, through the International Boundary and Water Commission, initiated consultation with Mexico regarding the proposed pilot project.

As a result this consultation, a Joint Report dated July 17, 2009 was drafted. The U.S., Mexico, and other non-governmental parties have committed to offsetting the reduced bypass flows with up to 30,000 acre-feet of water and to participate in the Colorado River Joint Cooperative Process to further identify and develop potential long-term strategies for maintaining environmental values associated with the Cienega.

### Salinity

Increased salinity levels in the Colorado River affect agricultural, municipal and industrial users. Agricultural water users suffer economic damage due to reduced crop yields, added labor costs for irrigation management and added drainage requirements. Urban users must replace plumbing and water-using appliances more often, or spend money on water softeners or bottled water. Industrial users and water and wastewater treatment facilities incur reductions in the useful life of system infrastructure. Damages in the United States are estimated at \$330 million per year, and while economic damage in Mexico is not quantified it is also a significant concern.

In 1972, EPA required development of water quality standards for salinity in the Colorado River in accordance with Clean Water Act Section 303. The seven Colorado River Basin States formed the Colorado River Basin Salinity Control Forum (the Forum) in 1973. The Forum has developed numeric salinity standards for three locations in the Lower Basin as well as a basin-wide plan of implementation. The EPA has approved the standards and the plan of implementation adopted by the Colorado River Basin States. The water quality standards establish a flow-weighted average annual salinity standard that must be maintained on the lower Colorado River at the following locations:

Below Hoover Dam (to Parker Dam) - 723 mg/L

Below Parker Dam (to Imperial Dam) - 747 mg/L

At Imperial Dam - 879 mg/L

Implementation of the salinity control plan has ensured compliance with the numeric criteria while the Basin States continue to develop the water allocated to them by the Colorado River Compact. Millions of dollars have been spent to prevent 1.9 million tons of salt from entering the river.

#### Other Water Quality Issues

In 2005, the Governor of Arizona appointed The Clean Colorado River Alliance (Alliance) stakeholder group to address water quality issues for the Colorado River. In addition to salinity, the Alliance identified several other water quality concerns including nutrients, metals, endocrine disrupting compounds, perchlorate, bacteria and pathogens, and sediment. The Alliance issued a report titled Clean Colorado River Alliance Recommendations to Address Colorado River Water Quality, January 2006. The report includes a number of recommendations to monitor and mitigate the impacts of these pollutants.

