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COMMITTEE ON ENERGY AND NATURAL RESOURCES
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Chairman Murkowski, Ranking Member Cantwell and members of the Committee:

I. Introduction

My name is Tom Buschatzke and I am the Director of the Arizona Department of Water Resources. Thank you for providing me an opportunity to present testimony on behalf of the State of Arizona regarding the on-going drought in the western United States, how it is impacting my state, how we have prepared to offset or mitigate those impacts and how the United States may help Arizona meet the challenges presented by continued drought.

II. Background

The State of Arizona and its water users have a long history of developing water supplies and the necessary infrastructure to deploy those supplies to maximize their benefit to the citizens and businesses in our State. Sound management of those supplies has been a primary focus in our State and the arid nature of Arizona is a constant reminder of the value of every drop of water available to us. Arizona is fortunate to have a diverse portfolio of water supplies. Arizona currently uses about seven million Acre-feet of water per year statewide which comes from the following sources: the Colorado River-40%; Groundwater-40%; in state rivers-17%; and reclaimed water reuse-3%.

Arizona has a long history of collaboration and innovation to manage our water supplies. We have participated in interstate and international agreements to protect our Colorado River water supplies, beginning with the Colorado River Compact to recent agreements with Mexico through Minute 319. Arizona has created institutions over many decades that provide certainty for our water users. Some of those success stories include the Salt River Project, the Gila Project, the Wellton-Mohawk Irrigation and Drainage District, the Yuma County Water Users' Association, the Yuma Mesa Irrigation District, the North Gila Valley Irrigation and Drainage District, the Yuma Auxiliary Project-Unit B, the Central Arizona Project, the 1980 Groundwater Management Act, the Underground Storage and Recovery Act and the Arizona Water Banking Authority. Arizona and its water users have taken proactive measures and made hard choices over many decades to insure a high quality of life for our citizens and a vibrant economy and will continue to do so in the face of the on-going drought in the west.

Despite the actions and choices made by Arizona uncertainty remains and the vulnerability of our water supplies to drought is the subject of constant attention among water providers, water users and water managers around the state. Flexibility to manage water supplies and adaptation to drought conditions are part of Arizona's history and will continue to be a key management strategy now and in the future.

III. Challenges Imposed by the On-Going Drought

Arizona continues to experience drought and more than 85% of the State falls within "Abnormally Dry" to "Severe Drought" conditions. The Salt and Verde River watersheds are in the fifth consecutive year

of drought which has reduced the surface water supplies that are used in the Phoenix metropolitan area by municipal water providers and agriculture. That has resulted in an increase in groundwater pumping to backfill the reduction in those surface water supplies. The Salt and Verde River watersheds are also at increased risk to wildfires, as is the Gila River watershed, the other main source of Arizona's in-state river supplies. Allocations of surface water from the Gila River have also been reduced as a result of the drought. To address drought conditions and the impact on our water supplies and water users the Governor's Drought Interagency Coordinating Group has recommended that a Drought Declaration be adopted by Governor Ducey. That Declaration will allow aid to flow to farmers and ranchers from the United States Department of Agriculture for loss of production and it also raises public awareness regarding drought conditions affecting the State.

The west-wide drought presents some unique challenges for all Colorado River users and the State of Arizona. The Colorado River watershed is entering its 16th year of below average runoff due to drought. Arizona stands to lose 320,000 Acre-feet of its 2.8 Million Acre-feet Colorado River allocation when a Tier 1 shortage is triggered by Secretarial order pursuant to the 2007 Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations of Lake Mead. Under the Interim Guidelines a projection of the elevation of Lake Mead is made in mid-August for the first day of the next calendar year. If that projection shows Lake Mead falling below elevation 1,075 feet then a Tier 1 shortage is put into place starting on January 1 of that year. Today, Lake Mead is at elevation 1,076[1] feet. The probability of a shortage declaration in the Lower Basin of the Colorado River has been steadily increasing over the past few years. The probability of a shortage in calendar year 2016 is 33% and that increases to 75 %[2] for 2017. It is important to note that a Tier 1 shortage triggers reductions for Arizona, Nevada and the Republic of Mexico but not for California. Arizona shoulders the brunt of the shortage among the three states and Mexico, about 84% of the total.

Deeper shortages will occur if Lake Mead's elevation continues to decline. Between elevation 1,050 feet and 1,025 feet a Tier 2 shortage results in Arizona suffering a reduction of 400,000 Acre-feet and at elevation 1,025 feet Arizona loses 480,000 Acre-feet, a Tier 3 shortage. The probabilities of Tier 2 and 3 occurring have also been increasing as the drought continues. If Lake Mead's elevation continues to drop and falls below elevation 1,025 feet, the volume of shortage to Arizona is unknown at this time. This uncertainty creates a difficult task for Arizona: how to plan for a shortage that is unquantified but will undoubtedly be greater than 480,000 Acre-feet. As Lake Mead approaches elevation 1,000 feet, the near-term limit for diversions by Las Vegas, or continues to decline to dead pool at elevation 895 feet draconian shortages are likely to occur.

Low reservoir conditions in the Colorado River system impact not only water users, but directly impact the production of hydroelectric power from major dams on the River. For example, if Lake Mead falls below elevation 1,000 feet, the hydropower production from Hoover Dam will be cut in half. Glen Canyon Dam hydropower production is eliminated if Lake Powell falls below elevation 3,490 feet, and United States Bureau of Reclamation has indicated that impacts to power production could occur at elevation 3,525 feet.

Lake Mead's falling elevations are not tied strictly to reductions in flow of the Colorado River due to drought. A "structural deficit" in the water supplies available from Lake Mead to California, Nevada,

[1] Based on USBR Lower Colorado River Region's weekly Colorado River water supply report for May 18, 2015.
[2] Based on USBR Lower Colorado River Region's Colorado River April 24 Month Study and resulting projections of Lake Mead elevations.

Arizona and Mexico exists as an artifact of the "Law of the River", the complex set of laws, agreements, rules, regulations and operating criteria that govern the storage, use and delivery of Colorado River water. In short, in a normal year a set amount of water flows into Lake Mead but it is not enough water to cover releases for use, evaporation and delivery losses. That structural deficit results in an annual drop of about 12 feet in the elevation of Lake Mead. In wet years high flow in the Colorado River allows more than the normal amount of water to flow into Lake Mead so the elevation of the lake can rise and recover. The drought has limited high flows in the Colorado River so that Lake Mead is not receiving more than its normal annual inflow and water elevations do not have a chance to rebound.

The drought also causes other impacts indirectly related to reduced precipitation. The health of the watersheds of the Colorado, Salt, Verde and Gila Rivers is an increasingly important issue in the region. A number of national forests in Arizona were created primarily for watershed protection and are indicative of the fact that forest health and water supply are closely connected. The drought has exacerbated issues associated with poor forest management including fuels and timber management so that the risk to our forests from catastrophic wildfires is increasing.

IV. How Arizona Has Prepared For Drought

The water development projects put in place over the last century to utilize Colorado River water and in state rivers have created a solid foundation for meeting water demand with renewable water supplies. Yet, Arizona also recognized that reliance upon those renewable supplies made us vulnerable to potential shortages during drought.

To address that vulnerability Arizona took a giant leap forward in 1980 with the passage of the Groundwater Management Act. The Act was a hard fought compromise between agriculture, industry, mining interest and municipalities. It established a policy direction for the protection of central and southern Arizona's abundant groundwater supplies that were being mined at the time at an unsustainable rate.

Mandatory water conservation requirements for municipal, industrial and agricultural water users in that part of the state, termed "Active Management Areas" were elements of the Act. Agricultural acreage was capped and no new agricultural land was allowed to be put into production after 1980. New golf courses were limited in size and the amount of water they could use. New housing was required to show that it has a 100-year renewable water supply before it can be built. Community water systems, i.e., municipal providers, are required to have conservation and drought management plans in place. These aggressive water management actions reduced Arizona's water use over time while its population and economic output have increased. One result is that Arizona's dependence on groundwater has decreased from 53% in 1980 to 40% today. In addition, case studies included in the Colorado River Basin Study Phase 1 Moving Forward Report prepared by the United States Bureau of Reclamation show agricultural and municipal users in Arizona are some of the most efficient in the West. Arizona irrigation users in central Arizona and the Yuma area, average 80 - 85% on farm irrigation efficiency, while municipal water users in central Arizona have reduced per capita consumption by more than 20% since 2000.

The 1980 Groundwater Management Act incentivizes the conservation and conjunctive use of Arizona's surface water, Colorado River water, reclaimed water and groundwater and helps to protect water levels in aquifers in central and southern Arizona. To accomplish that goal, the Underground Storage and Recovery program was originally added to the Act in 1986 and later restructured in 1996. This suite of statutes allows for water to be stored underground and recovered at a later point in time. The

program has resulted in the storage of 9 million Acre-feet of water in our aquifers for Arizona. The Arizona Water Banking Authority, the Arizona Department of Water Resources, and the Central Arizona Project have prepared a plan to recover the water stored underground to further protect Arizona water users from the impact of shortage. The Arizona Water Banking Authority (AWBA), a state agency, was created in 1996 to allow for underground water storage for the specific purposes of supplementing Colorado River water supplies when shortages reduce supplies for tribal, municipal and industrial water users. The Arizona Water Banking Authority has stored 3.4 million Acre-feet of the 9 million Acre-feet total stored in Arizona. The value of underground storage was recognized by other States in the Colorado River Basin through the creation of interstate water banking agreements. Arizona stored 80,000 Acre-feet for California in a pilot program in the 1990's. That water has been recovered and delivered to California. Arizona stored another 600,000 Acre-feet for Nevada in the 2000's but that water has yet to be recovered and delivered to Nevada.

Arizona's history also includes a strong commitment to recycling and reuse of reclaimed water. One example of a major reuse program is the Palo Verde Nuclear Generating Station in the Phoenix metropolitan area. The Nuclear Generating Station contracts for 60,000 Acre-feet per year of treated municipal wastewater from the 91st Ave Wastewater Treatment Plant which serves five cities in the region. The 2010 agreement is for a 40 year term and replaces an earlier agreement from 1973.

To better monitor and adapt to drought conditions the State created the "*Arizona Drought Preparedness Plan, Operational Drought Plan*," in 2004. The plan provides information on drought contingency actions, ways to reduce water use during droughts and is designed to achieve more aggressive water savings as drought persists or worsens. It created a State Drought Monitoring Technical Committee that meets monthly to determine the drought status in Arizona. Local Drought Impact Groups feed information into that Committee. The Drought Interagency Coordinating Group reports annually to the Governor and makes recommendations for a drought declaration to be adopted. The Arizona Department of Water Resources publishes the "*Arizona Drought Preparedness Annual Report,"* that summarizes drought conditions and drought preparedness activities for the water year.

A holistic approach to water management was necessary to create the level of resiliency Arizona enjoys today. The programs authorized under the 1980 Groundwater Management Act and its progeny have left Arizona in a strong position to deal with the on-going drought at this moment in time. However, Arizona must continue to be proactive to insure that its resiliency will continue into the future. That will be a challenge for the State of Arizona.

V. The Role of the Federal Government

The Secretary of the Interior is the water master in the Lower Basin of the Colorado River and operates the entire Colorado River system pursuant to the "Law of the River" including the decree in *Arizona v. California.* The Secretary, through the Bureau of Reclamation, has taken preliminary steps to begin to address the Colorado River drought by participating in conservation efforts such as those included in the WaterSmart programs, Pilot System Conservation Agreement, and the Lower Basin Pilot Drought Response Actions Memorandum of Understanding. It is imperative that any actions of the Secretary of the Interior or the United States to aid drought stricken California be consistent with the Law of the River and not reduce the flexibility or impinge on Arizona's efforts to deal with the drought. Arizona already takes the lion's share of shortages and it is clear there is an increasing risk of deeper shortages on the River. Secretarial actions that might further impact Arizona are not warranted and would not be equitable.

Furthermore, the reliability and sustainability of the Colorado River system is critical to many Arizona Indian tribes and to the United States as trustee for those tribes. In partnership with the United States the tribes, and others, Arizona has settled 13 of 22 tribal water rights claims, in whole or in part. Central Arizona Project water from the Colorado River has been a key component of the water budgets for many of those tribal water rights settlements. Additional Central Arizona Project water is set aside for use in the settlement of the remaining tribal water right claims in Arizona. Insuring that Colorado River water is reliable is a necessity for the successful implementation of exiting settlements and for settling the remaining tribal claims in Arizona.

Augmentation of water supplies continues to be a key component for the future of Arizona. The need for augmentation to benefit Arizona was identified in the report entitled "*Arizona's Next Century: A Strategic Vision for Water Supply Sustainability,* January 2014." The December 2012 Colorado River Basin Water Supply and Demand Study, a joint effort by the seven Colorado River Basin States and the Bureau of Reclamation, identified augmentation as a potential solution to close a water supply and demand imbalance projected for 2060 in the Colorado River Basin study area. The importance of augmentation for the Colorado River has been recognized for many decades. In the Colorado River Basin Project Act the benefit of augmenting the supply of the Colorado River below Lee Ferry in the amount of 2.5 million Acre-feet was documented. (Public Law 90-537 90th Congress, S. 1004 September 30, 1968.)

In summary, Arizona would like to see additional opportunities for federal support of programs to conserve water that will benefit the entire Colorado River system rather than any one particular Colorado River water user.