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Subcommittee on Water and Power

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Chairwoman McSally, Senator Cortez Masto, and members of the subcommittee, my name is John Entsminger. I am the General Manager of the Southern Nevada Water Authority and Governor Sisolak's representative for the State of Nevada. Thank you for the opportunity to testify today on the Colorado River Drought Contingency Plans, also known as the DCP.

The Southern Nevada Water Authority (SNWA) serves 2.2 million people in Southern Nevada—more than 70 percent of our state's total population. We are dependent on the Colorado River for 90 percent of our municipal water supply. As the only major metropolitan city located on banks of the river, our community is highly aware that bold action is required—both inside our community and beyond the borders of our state—to respond to severe and sustained drought conditions affecting much of the American Southwest.

Today I urge congressional authorization be given to the Secretary of the Interior for implementation of the DCP, led by the seven basin states that share the Colorado River. This is a final step in a long and sometimes arduous process that has come about through collaboration and compromise among the river's many stakeholders. The authorization, which directs the Secretary to follow the Drought Contingency Plan that we have developed, is vital to protecting the populations and economies served by this river.

The role of the river.

The importance of the Colorado River cannot be overstated. This river is inarguably the most vital waterway in the West, sustaining the life and livelihood of seven western states and two countries located within some of the hottest and driest reaches of North America. The river supports the municipal water needs of approximately 40 million people in the United States and Mexico, including the states of Wyoming, Colorado, Utah, New Mexico, Arizona, Nevada and California, as well as 22 federally recognized tribes. The river irrigates 5.5 million acres of agricultural lands; supports the production of hydropower for much of the West; sustains 22 National Wildlife Refuges, Recreation areas and National Parks; and serves as an essential water supply for countless plant and animal species located within the Colorado River Basin, including at least seven that are threatened or endangered.

Historical context is useful to understand and appreciate the scale, magnitude and importance of the DCP, as well as the achievement it represents for the seven states that share this critical resource. The Colorado River's history is like the river itself—long, often turbulent and full of

many unpredictable turns. It is governed by a series of contracts, regulatory guidelines, federal laws, compacts, court decisions, decrees and a treaty with Mexico—collectively known as the "Law of the River." The 1922 Colorado River Compact divided the Colorado River Basin into two distinct divisions—the Upper Basin and the Lower Basin, allocating 7.5 million acre-feet per year (MAFY) to each. The 1928 Boulder Canyon Project Act and the 1948 Upper Colorado River Compact further divided the river among the Lower Basin states of Nevada, California and Arizona, and the Upper Basin states of Wyoming, Colorado, Utah and New Mexico, respectively. The Law of the River also recognizes Mexico's right to the river's flows and 1.5 MAFY was granted to Mexico through an international treaty between the U.S. and Mexico in 1944.

Current conditions and future outlook.

Over the last century, the flows of the river have ranged from a high of 26 MAFY in 1909 to a low of 4 MAFY in 2002. As chance would have it, the Colorado River Compact was negotiated during the wettest period in the river's recorded history. At that time, the river's flow was estimated at 18 MAFY. More recent modeling indicates an average flow of 14.8 MAFY. Meanwhile, current allocations in the U.S. and Mexico total 16.5 MAFY, excluding evaporation losses in the Lower Basin. Consequently, the sum of the actual compact apportionments and evaporation exceed the flow of the river in most years.

The challenges of this over-appropriation have been magnified by severe and sustained drought conditions in the Colorado River Basin. Between 2000 and 2018, overall snowfall and runoff into the basin were well below normal, representing the lowest 19-year average on record. These conditions quickly developed into the worst drought in the basin's recorded history and have resulted in significant water level declines in major system reservoirs.

Lakes Mead and Powell, formed by the construction of Hoover Dam in the mid-1930s and Glen Canyon Dam in the early 1960s, were designed in part to protect the states from such conditions—storing water in wet years for use when its dry. When full, these two reservoirs can hold approximately 50 million acre-feet of water, the equivalent of more than three years of supply for the seven Colorado River Basin states combined. Wet years, however, have been few over the last twenty years and these critical reservoirs are now 60 percent below their combined storage capacity. As a result, our supply buffer has been reduced by more than 8.6 trillion gallons of water.

Today's water planners can do something the river's early compact negotiators could not—we can glance back, beyond the historical record, and peer forward at possible future outcomes using complex modeling. Tree ring studies have provided insight to the paleorecord, a time before formal recordkeeping began. These studies indicate the river has endured much longer droughts than we are experiencing today. Likewise, modeling using probabilistic tools and climate change assumptions provide insight to our future and indicate the hydrology of the 21st century is markedly different than the hydrology of the past.

Multiple forward-looking studies over the years—including the U.S. Bureau of Reclamation's 2012 Colorado River Basin Water Supply and Demand Study, and the 2018 National Climate

Assessment—indicate that the challenges we face today are likely to follow us well into the future. These challenges include: rising temperatures; changes to precipitation patterns; reduced snowpack and runoff to rivers, lakes and streams; drastic decreases to critical storage reserves; dry soil conditions and increased occurrence of wildfires; and the encroachment of non-native species. Likewise, drought conditions are expected to become more frequent, intense and longer. Stakeholders on the river have continued to advance discussions on how to resolve long-term supply and demand challenges facing the system. However, the bulk of our efforts have focused on more immediate needs, both locally and regionally. We are working diligently to protect our critical water and power infrastructure, and water supply access in light of worsening drought conditions.

The drought, our recent experience and information brought about by research, studies and probabilistic modeling tools have fundamentally changed our collective understanding of the river. They have also given us a valuable opportunity—the ability to plan for the best possible outcome amid an increasingly formidable forecast.

Collaborative solutions over conflict.

It is well known that conflict is synonymous with this river, even in the best of times. But so too is collaboration, even in the worst. The challenges we have faced as a river community have been daunting, both in their magnitude and complexity. With so many stakeholders and so many needs to be met, the solutions are often complicated and slow to materialize. Developing new tools that respect and uphold the old rules that govern the river takes time, patience, persistence and a willingness to compromise.

The pace of progress is often slow, but extraordinary and beneficial change has come about by our willingness to work together. This approach has proactively and incrementally addressed evolving issues, providing water users greater and timelier certainty than would be possible through litigation. The seven states of the Colorado River have come together time and again since before the drought began, and in the years since, embarking on negotiations for improved flexibility and management of the river.

Our first major accomplishments in the late 1990s centered on ways to work across state lines to store unused supplies and divvy up surplus Colorado River flows. Despite our early challenges to agree and reluctance, at times, to give, we ushered in creative solutions that satisfied us all. By the turn of the 21st century, we had developed familiarity of the issues, concerns and perspectives of our upper and lower basin partners, and formed new foundations that led to historic changes on the river, including implementation of new rules for interstate water banking and the 2001 Interim Surplus Guidelines.

As drought took hold on the West, the prospect of surplus Colorado River flows began to diminish, and the Secretary of the Interior initiated a process in cooperation with the states to explore management of lakes Mead and Powell under shortage conditions. Difficult and challenging negotiations ensued, and once again the states rose to the challenges with the Seven States Agreement, a unified decision for how shortages would be shared among Lower Basin

water users. This work was the subject of an in-depth environmental review which included an analysis of the additional reductions in water use that are now reflected in the Lower Basin DCP. This comprehensive effort supported the Secretary of the Interior's 2007 Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead (2007 Interim Guidelines).

To date, a shortage has never been declared by the Secretary of the Interior, but future declarations are imminent and will be based on a projection of Lake Mead water levels as determined by the U.S. Bureau of Reclamation's Colorado River modeling efforts. The forecast is reviewed annually in August; if Lake Mead is forecasted to be at or below 1,075 feet on January 1 of the following year, a shortage declaration will be made. Under a shortage declaration, the amount of Colorado River water available for use by the states of Nevada and Arizona will be reduced as shown in Figure 1. California's share of shortage will be borne by Arizona in accordance with the Colorado River Basin Project Act.

Figure 1 – 2007 Interim Guidelines Shortage (in acre-feet).

Lake Mead Water Level	Nevada Shortage	Arizona Shortage
1,075 – 1,050 Feet	13,000	320,000
1,050 – 1,025 Feet	17,000	400,000
Below 1,025 Feet	20,000	480,000
	RECONSULTATION	

Nevada's response to drought.

Nevada is entitled to 300,000 acre-feet of Colorado River water annually, just 1.8 percent of the river's allocated flow. SNWA, serving the greater Las Vegas Valley and Nevada's largest population center, has contracts with the Secretary of the Interior for nearly all of the state's allocation. For our community, the Colorado River is our largest and most critical water supply.

Drought in the Colorado River Basin pose two challenges for SNWA and our community: possible reduction of Colorado River supplies associated with a federally imposed shortage declaration and challenges associated with continued operations of our intake and pumping facilities, which draw our Colorado River allocation from Lake Mead, during low lake level conditions. To offset risks, Southern Nevada responded with an aggressive conservation campaign, large-scale infrastructure improvements, water banking efforts, and contributions to basin-wide initiatives designed to help mitigate the impacts of drought. Key efforts are described below.

– We took quick and coordinated actions in 2002 to implement policies and programs designed to improve water efficiency and reduce water use in Southern Nevada. Today, SNWA operates one of the largest and most comprehensive water conservation programs in the nation. We have invested more than $250 million in education and water conservation incentive programs that have reduced our consumptive use of Colorado River water by as much as 100,000 acre-feet annually, despite the addition of more than 660,000 new residents.

– We constructed a new raw water intake and initiated construction of new pumping facilities, representing a near $1.5 billion investment, to ensure our continued access to Colorado River resources. These efforts are based, in part, on the recommendation of a citizen's advisory committee, which recognized the significant risk that Lake Mead could drop below and elevation of 1,000 feet, rendering our intake and pumping facilities inoperable and severing our access to Colorado River supplies. The new intake and pumping facilities will preserve our existing capacity to a Lake Mead elevation of 875 feet. The new intake is operational, and the new low-lake level pumping station is expected to become operational next year.

– Through Intentionally Created Surplus (ICS) established in the 2007 Interim Guidelines and interstate banking agreements with the states of Arizona and California and the U.S. Bureau of Reclamation, SNWA is able to store more than 200,000 acre-feet of water annually through on- and off-stream storage and recovery programs. Likewise, SNWA can store or "bank" water locally through the Southern Nevada Water Bank. To date, we have banked more than 1.8 million acre-feet of water through our water banking initiatives, nearly eight times Southern Nevada's 2017 Colorado River consumptive use. With continued emphasis on water conservation, we anticipate banking our conserved Colorado River resources, either under existing agreements or through new ICS accounting as proposed under the DCP. The latter is preferred to help proactively manage reservoir elevations by increasing water storage in Lake Mead.

Our community's sustained conservation response and adaptive management efforts have helped to avoid crisis in Southern Nevada. As a first responder, we are heartened to see similar efforts being undertaken by our partners along the river. Like Southern Nevada, many communities throughout the basin are developing and implementing aggressive water conservation programs, proving it's possible to decouple economic growth from water use.

Basin-wide drought response.

Regionally, the seven states have worked with federal partners and Mexico since 2007 to augment Colorado River water supplies, improve system efficiency, and protect power generation and access to water supplies. These efforts range from contributing funds to a cloud seeding program designed to increase the potential yield of snowfall in the Colorado River Basin, to system efficiency and conservation efforts that have mutual benefit to Colorado River Basin water users.

SNWA has joined other stakeholders in numerous agreements designed to help mitigate the impact of ongoing drought and bolster reservoir elevations. These efforts are intended to protect against critical reservoir elevations that threaten hydropower generation at Glen Canyon and Hoover dams, and preserve access to water supplies for millions of Lower Basin water users.

These collaborative efforts among the states, federal partners and other Colorado River stakeholders have reduced Lake Mead's water level decline by more than 30 feet.

Key basin-wide drought response efforts include:

- The 2007 Interim Guidelines, supported by the 2007 Colorado River Seven States Agreement, created a mechanism for the storage and recovery of ICS to encourage efficient use of Colorado River supplies, increase storage in major system reservoirs, increase surface water elevations in Lake Mead, and help to minimize or avoid the potential for declared shortages. More than 1.26 million acre-feet of ICS is stored in Lake Mead today.
- The U.S. Department of the Interior worked with project partners to fund budgeted costs of $172 million for construction of the Warren H. Brock Reservoir, an ICS project developed on the border between the United States and Mexico to improve system efficiency by conserving water ordered but not taken by Lower Basin contract holders.
- Signed in 2012 and 2017, respectively, Minute 319 and Minute 323 of the Mexican Water Treaty allows Mexico to store water in Lake Mead to buffer against shortages and provide environmental flows, access additional water when reservoir conditions are favorable, and reduce its entitlement during a shortage declaration. As part of Minute 323, Mexico committed to a Water Scarcity Plan (WSCP), which would add to the DCP storage contributions made by the Lower Basin states to mitigate against declining reservoir elevations in Lake Mead. Implementation is effective through 2026 and contingent upon finalization of the Lower Basin Drought Contingency Plan.
- The U.S. Bureau of Reclamation, philanthropic organizations and Colorado River water users committed to fund up to $36 million between 2015 and 2019 as part of a Pilot System Conservation Agreement for conservation projects that benefit the Colorado River system. Project partners evaluate and select projects, and compensate users for voluntary water use reductions. Resources created through reductions cannot be recovered by any individual water user. To date 170,000 acre-feet of water has been created and stored in Lake Mead.
- As an early precursor to DCP, the U.S. Department of the Interior and Lower Basin water users and states set a goal of developing 1.5 to 3.0 million acre- feet of water in Lake Mead before 2020 to serve as a "protection volume." As part of the agreement, parties agreed to use their best efforts to create a total of 740,000 acre-feet of protection volume between 2014 and 2017. This goal was achieved.

Despite these efforts, the risk of reaching critical levels at Lake Mead have increased substantially since the 2007 Interim Guidelines were approved and implemented.

A grim forecast for future conditions.

Modeling by the U.S. Bureau of Reclamation suggests a 69-82 percent probability of shortage in the next 5 years, assuming the hydrologic conditions of the last 100 years prevail. Frankly, these assumptions are optimistic given the realities of climate change. "Stress test" modeling using the same hydrology we've most recently experienced indicates a 45 percent probability Lake Mead could drop below 1,020 feet in less than a decade. At this elevation, we will hover just above the point at which the river can no longer deliver to downstream water users and power production is severely compromised. This is a worst-case scenario.

As shown in Figures 2 and 3, implementation of DCP will substantially reduce the risk of Lake Mead reaching a critical elevation of 1,020 feet.

Figure 2: Probability of Lake Mead Reaching < 1,020 Feet (Full Hydrology).

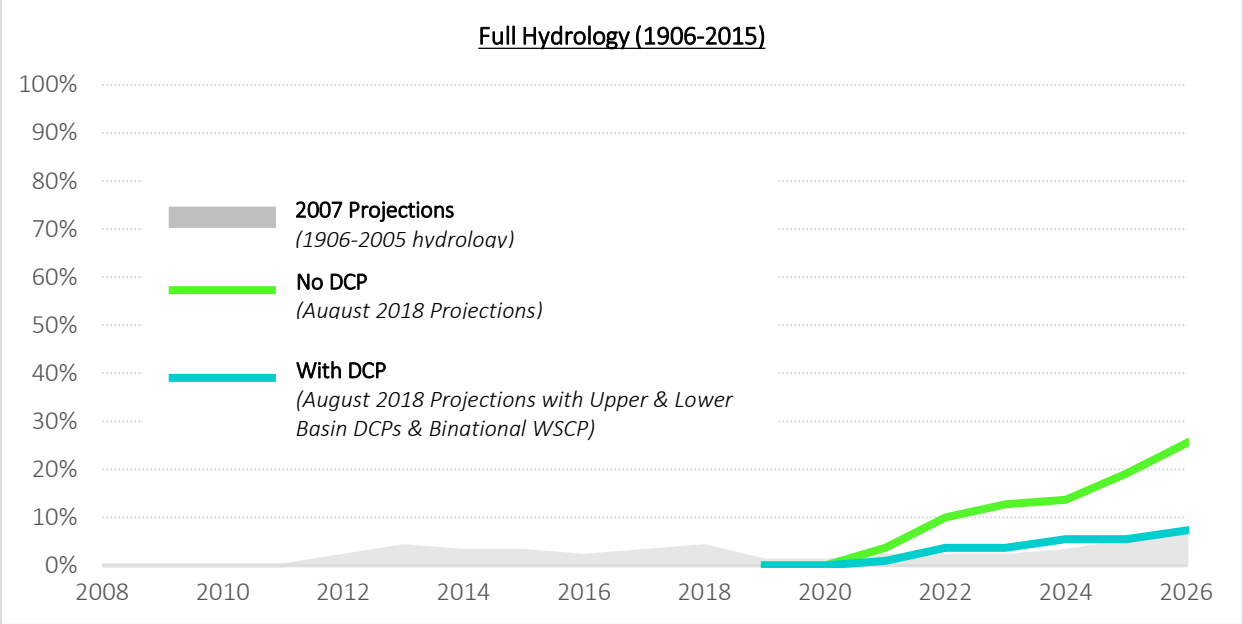
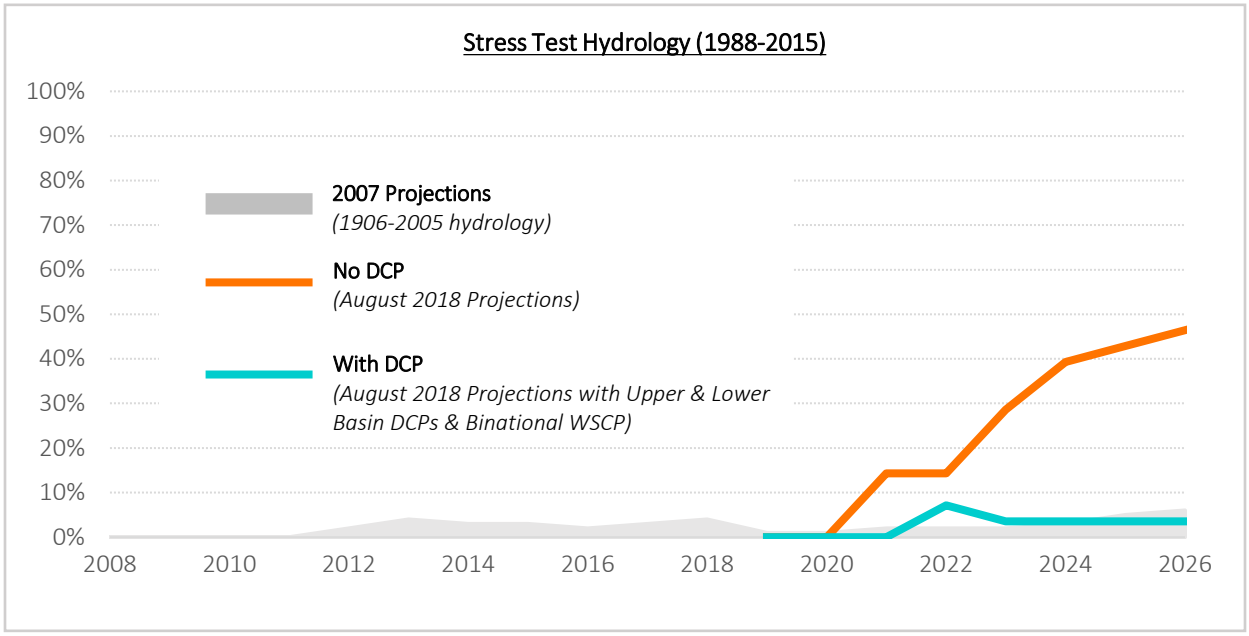


Figure 3: Probability of Lake Mead Reaching < 1,020 Feet (Stress Test Hydrology).



Precipitation and snowfall in the Colorado River Basin have improved for 2019, with heavy snows in the Rocky Mountains, which feed the river system. We could choose to be optimistic, but history, experience and recordkeeping cautions us to remember that even with normal

inflow—which we have not seen regularly in decades—Lake Mead water levels will continue to decline. This current drought has seen four years with above average inflow to Lake Powell. Yet only one of those years (2011) provided temporary relief to the declining trend in Lake Mead's elevation. The years following that temporary reprieve (2012 and 2013) were two of the driest back to back years on record. It would likely take decades of above-average inflows into the system to recover the storage we have lost over the last 20 years. While I remain hopeful that conditions will cause us to once again open the spillways of Hoover Dam as we did in the late 1990s, it would be ignorant to plan for anything more than our current reality.

Next steps – DCP.

The Basin states have worked for many years now to develop a plan that will provide greater surety for local and regional water supplies within the Colorado River Basin, and avoid catastrophic disruption to the people, economies and environments dependent upon the river. This has been a challenging exercise. There have been many bumps in the road, but we are proud of the agreements before you today.

The DCP works with and builds upon current operational guidelines by slowing Lake Mead's water level decline as critical elevations approach and by incentivizing water storage in system reservoirs. It more than doubles delivery reductions of the 2007 Guidelines below the 1,025-foot elevation threshold and brings more parties to the table to share in voluntary reductions (Figure 4). Further, DCP underscores the interdependent nature of the river's users and the need to share impacts. Mexico, recognizing the aggressive actions being taken in the United States, has already committed to share in these voluntary reductions. Although California is not required to participate in federally imposed reductions under the 2007 Interim Guidelines, California will share in voluntary reductions under the DCP.

Figure 4. Lower Basin and Mexico DCP Contributions.

LAKE MEAD ELEVATION	ARIZONA	NEVADA	CALIFONIA	MEXICO	
	DCP Contribution	DCP Contribution	DCP Contribution	Minute 323 Delivery Reduction	Binational Water Scarcity Contingency Plan
1090'	192,000	8,000	-	-	41,000
1075'	192,000	8,000	-	50,000	30,000
1050'	192,000	8,000	-	70,000	34,000
1045'	240,000	10,000	200,000	70,000	76,000
1040'	240,000	10,000	250,000	70,000	84,000
1035'	240,000	10,000	300,000	70,000	92,000
1030'	240,000	10,000	350,000	70,000	101,000
1025'	240,000	10,000	350,000	125,000	150,000

All volumes are shown in acre-feet. The United States Bureau of Reclamation commits 100,000 acre-feet at each trigger elevation.

As difficult as these agreements have been at times to navigate, they represent a historic achievement—individuals, states, tribes, and nations working together, respecting each state's legal interpretations, and crafting common sense compromises to proactively solve challenges presented by an uncertain future.

The Upper and Lower Basin plans are complementary and work together to achieve greater results in protecting system reservoirs. As the reservoirs decline, the additional water flowing to Lake Powell and the reduced demands from Lake Mead produce higher reservoir elevations than when implemented one basin at a time.

The DCP does not solve the totality of issues facing the Colorado River, but it is a bold step and a solid foundation for our collective future. I would be remiss not to acknowledge that there are real and related issues facing our communities, including the challenges of the Salton Sea. This is an important and pressing matter. It is an issue that has lingered too long, and the states agree that it must be resolved. But this current drought and the DCP actions that the States have presented to secure the water supply of the Southwest are not the cause of the Salton Sea's plight, nor will they exacerbate the situation in any way when implemented. Like our cities, the Salton Sea cannot count upon water from the river if the river fails. As such, it is within our collective best interest to protect Lake Mead from continued water level declines with the mechanisms agreed to by the states under the DCP.

Voluntary contributions with broad support.

Despite our celebrations for a strong snowpack this winter, we have little reason to believe that the worst of this drought is behind us. In fact, all indicators point to the contrary.

The shortage amounts prescribed by the 2007 Interim Guidelines are not enough to protect our communities against reservoir declines if dry conditions continue as we expect they will. Our fields, faucets, families and our strong economies are at grave risk if Lake Mead drops below critical elevations. The states that share the Colorado River recognize this; we recognize also our joint responsibility to protect this fragile system.

Once again, we have worked within the laws that govern this river it to find flexible solutions. Once again, we have chosen collaboration over conflict. Once again, we have moved slowly and deliberately and delicately to ensure that every voice at the table is heard, considered, weighed and recognized. And, once again we have found compromise.

A call to action.

On March 19, 2019, the seven Colorado River Basin States finalized and formally submitted the DCP to Congress. Today we seek your support for immediate implementation of our carefully laid plans. Simply put, the DCP needs to be authorized and executed by all parties in time to coordinate with Mexico on its contributions and to ensure that its elements are incorporated into 2020 water operations. This is imperative to ensure that the full range of conservation actions are implemented as soon as possible, which significantly minimizes the risk of lakes Mead and Powell falling to critically low levels.

We have come to this table voluntarily and with broad support from the states, environmental community, and nearly all other Colorado River stakeholders. We believe implementation of the DCP will resolve future conflict and reduce the risks we face as individual states and as the river community. The future of the American Southwest is dependent upon sustainable water supplies that are used efficiently and conjunctively managed. Your actions will support these efforts and help to secure the future of more than the 40 million people. Taking less water today will give us greater surety that this river will continue to serve us tomorrow.

I thank you for the opportunity to share my thoughts and look forwarding to answering any questions you may have.

Attachments:
Basin States Transmittal Letter to Congress
NGO Support Letter to Congress